

# Journal of Agriculture, Food Systems, and Community Development

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Fall 2011

Special Topic:  
*Planners Coming to the Table*



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# Journal of Agriculture, Food Systems, and Community Development

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**For this issue's cover**, we include pioneers of food systems planning, along with up and coming professionals and researchers. The photos include (clockwise from top):

- 1 City of Des Moines' (Washington) Healthy Des Moines Initiative staff and key stakeholders meet with urban planning consultants to discuss a land use assessment of healthy food access for inclusion of healthy eating goals, policies, and strategies in the comprehensive plan.

*Names and affiliations (left to right):* **Branden Born**, associate professor, Department of Urban Design and Planning, University of Washington (see his contribution in this issue's *Preparing Future Food System Planning Professionals and Scholars: Reflections on Teaching Experiences*); **Kara Martin**, urban planner, Urban Food Link, LLC; **Brice Maryman**, landscape architect, SvR Design; **Amalia Leighton**, civil engineer, SvR Design; **Barbara Houston-Shimizu**, executive director, South King County Food Coalition; **Kim Richmond**, volunteer project manager, Daisy Sonju Community Garden & Pea Patch; **Laura Techico**, land use planner, City of Des Moines; **Denise Lathrop**, planning manager, City of Des Moines; **Eva Ringstrom**, graduate research assistant, Department of Urban Design and Planning & Evans School of Public Affairs, University of Washington; **Sean Keithly**, urban planner, CollinsWoerman. Photo by **Sue Anderson**, policy analyst, Healthy Des Moines Initiative director, City of Des Moines, Washington.

- 2 Planner **Jenna Silcott** administers a rapid market survey at a farmers' market on the Mississippi Gulf Coast. Visitors to the farmers' market were asked about how often they come to the market, whether they will do additional shopping in the area, and how far they live from the market. See *Evaluating Food Systems in Comprehensive Planning: Is the Mississippi Gulf Coast Planning for Food?* in this issue.

- 3 **John Lubczynski** at the St. Jacobs Farmers' Market in the Township of Woolwich, Ontario, in September 2011. John works as an urban planner at the Regional Municipality of Waterloo, Ontario, Canada, and helped draft the food system policies in the new Regional Official Plan. John co-authored *Incorporating Policies for a Healthy Food System into Land Use Planning: The Case of Waterloo Region, Canada* in this issue.

- 4 **Jerry Kaufman** (emeritus professor, Department of Urban and Regional Planning, University of Wisconsin–Madison) with **Kami Pothukuchi** (associate professor of urban planning, Wayne State University) at Wayne State in August 2011. See their contributions in this issue's *Preparing Future Food System Planning Professionals and Scholars: Reflections on Teaching Experiences*.



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## IN THIS ISSUE

### DUNCAN HILCHEY

## Planners coming to the table

Published online 1 January 2012

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In this issue, “Planners Coming to the Table,” we focus on how the planning community has come in recent years to embrace food systems as a legitimate focus of their profession. This is a watershed event, since planners are trained to provide systematic analyses and process skills to opportunities and challenges faced by communities — things all too often lacking in agriculture and food system work.

Back in 1986 when I was a graduate student in the department of city and regional planning, with a focus on food systems and a minor in extension education, at Cornell University, I was a bit of an odd duck, talking in graduate seminars about food policy councils, how the city of Knoxville was retrofitting buses and changing their routes to accommodate inner-city grocery shoppers, and how farmers’ markets were really functioning as rural microenterprise incubators. My advisor, Pierre Clavel, the recently retired professor and author of *Progressive Cities* (1986) and *Activists in City Hall* (2010), humored my interests and encouraged me to passionately pursue food system planning. I wasn’t the only planning student interested in food and agriculture, but at that time we were few and far between.

Today the situation is quite different. The American Planning Association has adopted a “Policy Guide on Community and Regional Food Planning,” planning students are pressing their departments to offer food system planning courses, and Cornell and many other planning programs around North America have begun to accommodate them: hiring faculty with food systems expertise, developing new courses, PhD programs, research groups, and the like (e.g., efforts at the University of Buffalo and the University of Wisconsin). In this issue you will read about the pedagogical roots of this nascent field of planning and get a glimpse into cutting-edge practices.

We dedicate this issue to Jerome Kaufman and the intrepid young planners he has helped to inspire, some of whom are pictured on the cover of this issue (see the cover photos’ captions at the top of the table of contents). They have challenged the conventional wisdom in the planning profession and successfully argued that food systems uniquely bridge well established planning fields such as community and economic

development, land use, and transportation. While food system planners are really just at the beginning of this exciting period of growth, they have added their shoulders to the wheel, and as a result we will see an accelerated pace in the movement to create more equitable and sustainable food systems. For this, we take our collective hat off to you!

In this first issue of our second volume, papers cover a broad swath of the nascent food system planning field — from pedagogy to practice. **Mendes and Nasr (with multiple contributors, including Jerome Kaufman)** and **Soma and Wakefield** explore the emerging roles (opportunities and challenges) of planning faculty and practicing planners. **Minaker and co-authors** and **Freedgood and co-authors** provide a thorough review of the approaches and tools used by planners and allied professionals to assess community-level food systems. **Evans-Cowley** and **Desjardins and colleagues** provide detailed case studies of incorporating food systems into regional comprehensive planning. One of the powerful analytical tools planners can bring to the table is geographic information systems. **Giombolini et al., Ruelle et al., Nixon and Doud,** and **Hu et al.,** use spatial analysis to explore the potential for diversification, foodshed development, food security infrastructure, and spatial characteristics of food deserts. **Horst et al., Day-Farnsworth and Morales,** and **Levkoe and Wakefield** make explicit cases for planner engagement in alternative value chains, food distribution systems such as urban food hubs (for which they propose a new typology), and community food centers.

Our open call papers in this issue include **Burnett et al.’s** consumer preference study, which suggests that a more narrow definition of “local” may not increase price premiums significantly. **McCuistion et al.** studied cattle morbidity in a niche beef cooperative and make management recommendations to minimize losses and costs. **Jackson et al.** provide a case study of the unique health insurance rebate program managed by a CSA coalition in Wisconsin. Finally, **Adekunle et al.** explore ethnic vegetable demand in Toronto and the prospects for farm diversification in response to that demand.

We also offer two superlative book reviews: **Eliav Bitan** reviews Fred Kirschenmann’s latest collection of essays, entitled *Cultivating an Ecological Conscience*, and **Nevin Cohen** reviews de la Salle and Holland’s *Agricultural Urbanism: Handbook for Building Sustainable Food Systems in 21st Century Cities* — calling it a “manifesto” about building place around food.

Lastly, our regular columnists offer their views on hot topics related to food system planning and current affairs. **Rami Zurayk** writes about the absurdities of the current global food regime and the need for it to be “occupied.” **Ken Meter** gives us 17 reasons to conduct food system assessments and challenges us to think deeper than numbers alone. **John Ikerd** explores the challenges of land use planning for sustainable food systems and offers a potentially more equitable and viable approach to farmland protection than purchasing development rights.

Happy reading — and best wishes for 2012!



*Duncan Hilchey*

*Publisher and Editor in Chief*





**THE ECONOMIC PAMPHLETEER**  
**JOHN IKERD**

**Land use planning for sustainable food systems**

Published online 7 November 2011

Citation: Ikerd, J. (2011). Land use planning for sustainable food systems. *Journal of Agriculture, Food Systems, and Community Development*, 2(1), 3–5. <http://dx.doi.org/10.5304/jafscd.2011.021.010>

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A sustainable food system must be firmly rooted in the wise use of land. Fortunately, local foods initiatives increasingly involve planned uses of agricultural land. While professional planners, architects, and staff of nongovernmental organizations may all be involved, land use planning begins with decisions made by state and local governments. Effective land use planning requires a public consensus to support making land use

decisions on some basis other than economic value. Such a consensus ostensibly exists in most urban areas for residential and commercial uses of land, although economic interests typically dominate actual planning and zoning decisions. Public support for planning and zoning of agricultural land in rural areas is even more tenuous. Lack of a public consensus for wise land use planning could

**John Ikerd** is professor emeritus of agricultural economics, University of Missouri, Columbia. He was raised on a small dairy farm in southwest Missouri and received his BS, MS, and Ph.D. degrees in agricultural economics from the University of Missouri. He worked in private industry for a time and spent 30 years in various professorial positions at North Carolina State University, Oklahoma State University, University of Georgia, and the University of Missouri before retiring in 2000. Since retiring, he spends most of his time writing and speaking on issues related to sustainability with an emphasis on economics and agriculture. Ikerd is author of *Sustainable Capitalism*; *A Return to Common Sense*; *Small Farms Are Real Farms*; *Crisis and Opportunity: Sustainability in American Agriculture*; and, just published, *A Revolution of the Middle*. More background and selected writings are at <http://web.missouri.edu/~ikerdj>.

*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.*

become a major obstacle in the development of sustainable food systems, thus the need for greater understanding of the issue.

Sustainability is about the long run: meeting the needs of present generations without diminishing opportunities for generations of the future. Economic value is inherently short-run in nature. In the absence of land use planning, economic incentives allocate parcels of land to their highest economic use. Economic value accrues to the individual. There is no economic value in doing anything solely for the benefit of someone else or for society in general. In addition, there is no means for individuals to realize economic value after they are dead. Since life is inherently uncertain, economic value places a premium on the present relative to the future. It is worth more to the individual to have something today rather than to wait until sometime in the future. That's why people are willing to pay interest — and why they expect interest when they borrow or loan money. For example, at an interest rate of 7%, an economic payoff of \$1,000 expected one hundred years in the future is worth less than \$1 today. The needs of future generations have little, if any, effect on the economic value of land. Allocating land to its highest economic use simply is not sustainable.

Land must be treated as a common good, rather than private property. There is no inherent problem in allowing users of land to realize economic value from their improvements to land. Individuals should be able to benefit from improving fertility, reducing erosion, or building physical structures on their land. However, the inherent capacity of the land to produce things of value, including the geographic space occupied by land, wasn't created or produced by any individual. It does not and cannot belong to any individual. It is a part of the commons — meaning if it belongs to anyone, it belongs equally to all. The people in common, not the mar-

kets, must decide how land is to be used for the common good — for the good of society as a whole. There is no function of government more critical to sustainability than land use planning.

All natural resources were once in the commons — equally accessible to all. It wasn't until the seventeenth century that John Locke declared that although “God hath given the world to men in common,” any individual could appropriate some bit of it for himself by mixing his labor with the resources of nature.<sup>1</sup> This is the classic justification for today's private property rights. However, Locke also wrote the Lockean Proviso, which states that although individuals have a right to acquire private property from nature, they must leave “enough and as good in common...to others.”<sup>2</sup> Locke recognized the equal rights of all to the use of land.

Land use planning for sustainable food systems must protect the productive potential of agricultural land. Current agricultural production is supported by cheap and abundant fossil energy. Those of future generations, however, will again have to rely for their food on the solar energy collected by healthy green plants grown on healthy, organic soils. The organic fraction of soil can be restored through wise use over time. However, the mineral fraction of healthy soils and hospitable climates and typographies are essentially nonrenewable resources that must be conserved and recycled in place. In addition, agricultural, residential, and commercial land uses must be integrated in the process of redesigning an efficient food distribution system for a world running out of fossil

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**Land use planning for  
sustainable food systems  
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<sup>1</sup> Locke, J. (1690). *The Second Treatise of Civil Government* (Chapter V, Of Property). Retrieved from <http://www.constitution.org/jl/2ndtr05.htm>


<sup>2</sup> Wikipedia, The Free Encyclopedia, *Lockean Proviso* (last revised 6 July 2011, 22:49 UTC), retrieved 8 March 2011 from [http://en.wikipedia.org/w/index.php?title=Lockean\\_proviso&oldid=438136864](http://en.wikipedia.org/w/index.php?title=Lockean_proviso&oldid=438136864)

energy. If we continue to allow parcels of land to be allocated to their highest economic use, enough productive land simply will not be left in the right places to meet the food needs of future generations.

Innovative land use planners have already devised various promising strategies for sustainable land use planning. Purchasing development rights for strategically located agricultural land probably is the most prominent. While commendable, the cost of acquiring rights to sufficient quantities of land to meet the food needs of future generations will almost certainly be economically prohibitive. A more promising economic alternative is cluster development, which can realize most of the development value while preserving the most productive agricultural land as key parts of planned developments.

Ultimately, land use decisions must be made for the good of the people in common, including those of the future. This means large acreages of land will have to be permanently zoned for agriculture. Such

parcels will lose the portion of their current value associated with potential future development. This development value was created by society, not by landowners, so there is nothing ethically wrong with society taking it back. However, current landowners may have purchased such parcels from someone else at a price inflated by the development potential, which raises legitimate questions of compensation for down-zoning to permanent agriculture.

Planning and zoning decisions obviously create economic value whenever land is up-zoned to more-intensive uses. Again, such values are not created by landowners, but rather by society. It seems only logical and ethical that increases in land values associated with up-zoning to more-intensive uses be taxed to compensate owners of land that is down-zoned from commercial, residential, or agricultural to “permanently agricultural.” Regardless, the means of compensation will become feasible once there is a public consensus supporting sustainable land use planning. 





## METRICS FROM THE FIELD

*Blending insights from research with insights from practice*

**KEN METER**

### Seventeen reasons to do food system assessments

Published online 30 November 2011

*Citation:* Meter, K. (2011, November). Seventeen reasons to do food system assessments. *Journal of Agriculture, Food Systems, and Community Development*, 2(1), 7–9. <http://dx.doi.org/10.5304/jafscd.2011.021.014>

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*If the purpose of a food system is to build health, wealth, connection, and capacity in our communities, then the process of assessing food systems should also contribute to those aims. Moreover, each food system assessment should be explicit about its approach to systemic analysis. Here are some detailed suggestions for why food system assessments should be compiled, and how they can better reflect core system dynamics.*

**W**hy do we compile food system assessments?

There are several solid answers to this question, of course: (1) Compiling a thorough set of measures of prevailing conditions helps establish an understanding of the baseline situation, which is useful for evaluating progress over time. (2) Without creating an explicit vision for a local or regional food system, it is very difficult to make (or measure) progress toward that vision. Compiling an assessment can help define such a vision. Further, (3) having one vision clearly articulated can help bring stakeholders together to work for a

common purpose. Moreover, (4) it is deeply useful to consider the totality of the system, if possible. This helps (5) assure stakeholders that all of the major dynamics are in view, which may lead to more effective action. In addition, (6) by identifying central forces, pressure points, and contradictions within the system, local foods initiatives can more effectively set strategic priorities,

**Ken Meter** is president of Crossroads Resource Center in Minneapolis, Minnesota. He has performed 78 local food-system assessments in 30 states and one Canadian province; this information has promoted effective action in partner communities. He served as coordinator of the review process for USDA Community Food Project grants, and has taught economics at the Harvard Kennedy School and the University of Minnesota. He is co-convenor of the Community Economic Development Committee of the Community Food Security Coalition. A member of the American Evaluation Association's Systems Technical Interest Group, Meter also serves as an Associate of the Human Systems Dynamics Institute. He serves as a contributing advisor to JAFSCD.

(6) better understand how the system may resist efforts to change, and (7) better estimate how actions in one arena might impact stakeholders and issues in another. Many food leaders also point out that food system planning has so far been accomplished, by default, by private business interests who configured the system, and related public incentives, to maximize the profits of some key players in the system at the expense of others — leading to immense imbalances of power and access. We need to plan, this argument goes, (9) to foster private/public collaboration to build food systems that achieve better outcomes and that broaden participation in planning so our food systems actually contribute to democracy.

All these replies strike me as true. Yet to me they also invite further questions at even greater depth: “What is the purpose of a food system?” and “Why do we call these food *systems*, anyway?”

To the first question, my response is that a sustainable food system will achieve four main purposes. It will build health, wealth, connection, and capacity in our communities (Meter, 2009). This seems common sense, yet the complexity of this purpose is often overlooked in the political fray.

I know farmers who feel that a food system is successful in any year in which they make good money — and not a subject for discussion when they do not. Other experts think the food system is working if farmers have access to the most advanced technologies available — whether farmers or consumers benefit from these technologies or not. I know people who consider a food system successful if its major businesses are large — but who overlook the fact that at the same moment, large portions of the population are not eating well. The importance of connecting culturally around food is often ignored in our food planning discussions. Seldom do I hear food planners raise the issue of building the capacity of consumers to hold the

productive skills required to produce, prepare, and eat healthy foods.

Unfortunately, I see very smart people argue that the purpose of our work right now is to “go to scale,” when in fact “going to scale” is a strategy, not a purpose. If scaling up fails to build health, wealth, connection, and capacity at the community level, it is the wrong strategy. This test, of course, should be applied to *any* strategy being contemplated.

My set of purposes is difficult to put forward amidst a political climate that is devoted to short-term fixes. Part of the difficulty is that to assert this approach is to say that our purposes *themselves* are systemic — they cannot be boiled down to a single target. Our purposes interact with each other, and our ability to know how well we are progressing shifts daily. This is especially true now that so many people are diving into so much good work all at once. It is literally impossible to know all of what is happening.

I have already slipped into using systems language, which means I have entered the second of my two questions. Why do we call these food *systems*? Well, in part because what is going on is complicated, entangled, and not entirely knowable. Systems are not open to simple changes, because when one element of the system shifts, another force may resist, or reinforce, that change.

Some planners believe that if they put very systematic tables of measures, facts, and maps into a large document, then they have succeeded in holistically describing “the food system.” This view suffers from the assumption that *being systematic in one’s analysis* is the same as *understanding the systemic forces at work*. Rather, I have come to understand — with the help of many generous colleagues — that food systems are complex and adaptive (Meter, 2006).

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As I have argued in this column previously (Meter, 2010), the critical elements of food systems are changing rapidly, so what we measure this year may be less relevant next year. We need measures of *emergence*, and cannot afford to pretend the system sits still long enough for us to fully measure static facts. We must take measurements, and we must also understand their limits.

One of the complexities of systemic work is that the frames we use to analyze systems deeply impact what we see. If, for example, we view systems as predictable and static, we will tend to see those elements that might be considered stable, and may miss what is emerging. If we view systems as reducible to quantitative measures, we may only see those things that can accurately be counted, and may miss qualitative insights of deeper significance. If we focus on emergence, we may overlook more stable attributes.

The implication of this is that, as analysts, we need to be clear about the *systems assumptions* we make when we perform a food systems assessment, so we can help ourselves and our colleagues understand the potential strengths and blind spots of our own work. I am quite struck by how few analysts make their view of systems explicit, or even study systemic constructs enough to know there might be alternate frameworks that are useful for viewing a single system.

With this in mind, let me add to the list I offered at the start of this essay. The purpose of a food system assessment may also be (10) to build the capacities of local residents to understand, participate in, shape, and help evaluate their own food systems; (11) to ensure that cultural connections to food, and social connections among food system stakeholders, are strengthened; (12) to understand prevailing economic conditions affecting the food system, and the potential economic impacts of food system activity; (13) to become more clear about the assumptions we make when we address complex issues and systems; (14) to become more sophisticated in building our own systems frameworks so they more accurately reflect conditions on the ground as we move forward; (15) to capture

insights into emergence, and how to effectively respond to changing conditions over time; and (16) to create transformative insights, including analysis of key “levers” that can move the system to a more sustainable place. Often all of this requires (17) giving voice to those who have been marginalized, since those on the margins — including low-income residents, immigrants, and ethnic communities — often understand system dynamics more accurately than do those in more privileged positions, because they understand viscerally how the system pushes back.

If the purpose is to build health, wealth, connection, and capacity in communities, then the very process of assessing the food system must advance those aims. Having performed 78 food system assessments to date, both large and small, I understand the value of the large, comprehensive documents that are intended to reach policy makers (see Meter, 2012), but I am also aware of the small number of people who actually read such reports completely. I am quite persuaded that a relatively inexpensive but searching and honest analysis often has far more impact than the large tome — unless we are speaking strictly of the sound made when each document hits the floor when dropped from six feet in the air. 

## References

- Meter, K. (2006). Evaluating farm and food systems in the U.S. In B. Williams & I. Imam (Eds.), *Systems concepts in evaluation: An expert anthology*. [American Evaluation Association monograph]. Point Reyes, California: EdgePress of Inverness.
- Meter, K. (2009, October). *Mapping the Minnesota food industry*. Minneapolis, Minnesota: Crossroads Resource Center. Available at <http://www.crcworks.org/mnfood.pdf>
- Meter, K. (2010). Metrics from the field: Letting food systems emerge. *Journal of Agriculture, Food Systems, and Community Development*, 1(1), 23–25. <http://dx.doi.org/10.5304/jafscd.2010.011.006>
- Meter, K. (2012). *Hoosier farmer? Emerging food systems in Indiana*. Indiana State Department of Health and Crossroads Resource Center. Will be available January 2012 at <http://www.crcworks.org/infood.pdf>







## GLOBAL VIEWS OF LOCAL FOOD SYSTEMS

*Reflections on the growing worldwide local food movement*

**RAMI ZURAYK**

### Occupy the global food regime

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There is a new Muppet on Sesame Street. She is named Lily and is sponsored by corporate giant Walmart.<sup>1</sup> Her job is to educate American children about hunger, malnutrition, and food insecurity in the United States. I watched an episode on YouTube<sup>2</sup> and learned that in the U.S., 50 million children go to bed hungry 3 or 4 times a month, and that, according to the USDA, 17 million children, or one in every four American kids under age 6, are affected by hunger and malnutrition. That this should happen in the country that is the world's largest food producer and the world's largest food exporter is undisputable evidence of the insanity of the current food regime.

That food regime was born sometime during the mid-twentieth century, when the Global South

became the main recipient of food surpluses produced from Northern industrialized agriculture. Local food systems were destroyed in the process, and so was smallholder agriculture. The Green Revolution brought increases in yield in the South, associated with tremendous social disruptions and reliance on imported farm inputs produced by Northern corporations. A new capitalist, export-based agriculture flourished in some parts of the South, favoring traders and financiers, while basic food commodities and processed foods continued to be imported from the North. In the late 20th century, private corporations strengthened their hold on the global food regime. Holt-Gimenez and Shattuck (2011) describe it as being based on the

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<sup>1</sup> Walmart. (2011, October 4). Brad Paisley, Kimberly Williams Paisley and the Sesame Street Muppets help families cope with hunger. Retrieved from <http://walmartstores.com/pressroom/news/10729.aspx>

<sup>2</sup> WIVBTV. (2011, October 5). Sesame St. Muppet will highlight hunger. Retrieved from <http://www.youtube.com/watch?v=XxaI4ea58mA&feature=related>

“unregulated expansion of global markets...a belief that methods drawn from business can solve social problems” (2011, p. 119). They further contend that “the regime is firmly held in place by Northern-dominated international finance and development institutions (e. g. Cargill, Monsanto, ADM, Tyson, Carrefour, Tesco, Walmart), agricultural policies of the G-8 (US Farm Bill, EU’s Common Agricultural Policy) and big philanthropy capital (e.g., The Bill and Melinda Gates Foundation)” (Holt-Gimenez, 2011, p. 119).

The unregulated expansion of global markets, which is a main attribute of the global food regime, was at the core of the food crisis of 2008, in which speculations by companies that dominate the corporate food regime were a major cause of the spike in food prices that caused millions to fall into malnutrition. If the globalized and corporatized food regime leaves millions of U.S. children hungry at bedtime while grain silos are overflowing, imagine what it can do in countries of the South that are plagued with shaky economies, chronic poverty, and corrupt governments. Take for example Ethiopia, one of the most food-insecure countries in the world.

A recent study completed by risk analysis and mapping consultants Maplecroft found Ethiopia to be the seventh most food-insecure country out of 196, not far behind Somalia and the Democratic Republic of Congo. The study used the FAO 12 key determinants of food security to determine the Food Security Risk Index (FSRI). These determinants include availability of food, access to food, and stability of food supplies at national and regional levels, as well as population health status. Droughts and conflicts were listed as major causes of food insecurity, but these were, according to Maplecroft, “compounded by human factors which have the greatest effects on the most vulnerable

populations. These include volatility in the commodity market relating to speculation by bank and hedge funds and the increased use of biofuels in the developed world, both of which have contributed to spikes in cereals and vegetable oil prices” (Maplecroft, 2011, “Global food stocks ‘alarmingly’ low,” para. 4). This is especially alarming as the markets continue to be totally deregulated and the United States moves further into the production of inedible genetically modified corn destined for ethanol production (Goldberg, 2011).

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**Land grabbing has spread like the plague in Asia and Africa.**

**Investors trying to make a profit from the spike in food commodities are rushing to acquire enormous swathes of land to practice intensive and export-oriented agricultural production.**

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But speculation by banks and hedge funds do not only artificially raise food prices; they also drive large-scale investments aimed at the production of tradable food commodities. Land grabbing, or what is euphemistically called “international investments in agriculture,” has spread like the plague in

Asia and Africa. Investors trying to make a profit from the spike in food commodities are rushing to acquire enormous swathes of land to practice intensive and export-oriented agricultural production. As a result, small farmers from many countries of the Global South are being driven off their land and made even more food insecure. Investors implicated in land grabbing include states such as China and Saudi Arabia, commodity trading companies such as Cargill, and also, some reports suggest, prestigious U.S. universities through their endowment funds (Vatsal, 2011), and even some philanthropic foundations like the Walmart Foundation, which has reportedly set aside US\$1 billion to invest in agriculture in Africa (Baxter, 2011). Ethiopia also suffers most from land grabbing. Much has been published about the issue, but a recent book by Aklog Birara entitled *Ethiopia: The Great Land Giveaway* fully documents this phenomenon and sheds light on the ruthlessness of a global food regime in which food can be produced and exported from the very

nations that suffer from endemic malnutrition and recurring famines.

The absurdity that can result from such export-driven agricultural investments is exemplified in a new wine production project implemented in Ethiopia's fertile Rift Valley in partnership with the French company Castel. In a recent article in the British newspaper *The Guardian*, the head of sales at Castel was quoted as saying, "If our wine can contribute to improving this country's image, we'll have succeeded" (Lepidi, 2011, para. 4). Surely those dying from hunger in Ethiopia will be comforted at the thought that someone is thinking positively about their country while sipping Rift Valley chardonnay.

The injustice and indecency of the global food regime has been exposed time after time. Yet it continues to dominate our lives — and our land. Many are calling for its reform, especially in the institutions that are closest to the centers of power. Others contend that reforms today will only serve as temporary measures and that the food regime cannot be dissociated from the global economic regime. Some things are sure: discontent is rife and voices are rising across the world, from Tahrir Square to Zuccotti Park, demanding a complete overhaul of the system. But it looks like it will take more than Muppet Lily to convince them otherwise, even if it is sponsored by the Walmart Foundation.



## References

- Baxter, J. (2011, April 21). The war on Africa's family farmers [Farmlandgrab blog post]. Retrieved from <http://farmlandgrab.org/post/view/18501>
- Birara, A. (2011). *Ethiopia: The great land giveaway - Yemeret neteka ena kirimit*. Gaithersburg, Maryland: Signature Book Printing.
- Goldenberg, S. (2011, August 15). GM corn being developed for fuel instead of food. *The Guardian*. Retrieved from <http://www.guardian.co.uk/environment/2011/aug/15/gm-corn-development-food-fuel>
- Holt-Gimenez, E., & Shattuck, A. (2011). Food crises, food regimes and food movements: Rumbblings of reform or tides of transformation? *Journal of Peasant Studies*, 38(1), 109–144. <http://dx.doi.org/10.1080/03066150.2010.538578>
- Lepidi, P. (2011, September 6). Ethiopia uncorks a new export with French wine-making partnership. *Guardian Weekly*. Retrieved from <http://www.guardian.co.uk/world/2011/sep/06/ethiopia-france-winemaking-partnership-lepidi>
- Maplecroft. (2011, August 31). Somalia, DR Congo top Maplecroft's food security risk ranking – Horn of Africa food crisis worsened by human factors. Retrieved from [http://maplecroft.com/about/news/food\\_security.html](http://maplecroft.com/about/news/food_security.html)
- Vatsal, E. (2011, July 14). Prestigious U.S. Universities Exposed for "African Land Grab" [Toonari-post blog post]. Retrieved from <http://www.toonari-post.com/2011/07/world-news/prestigious-u-s-universities-exposed-for-%E2%80%9Cafrican-land-grab%E2%80%9D/>



## Preparing future food system planning professionals and scholars: Reflections on teaching experiences

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### **Abstract**

This article fills a gap in knowledge related to the preparation of future food systems professionals and scholars. Specifically, the article explores

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challenges and opportunities encountered by educators who teach food systems courses in university settings. The topic of food systems has recently experienced a boost in acceptance as an area of academic inquiry and legitimate professional practice. The article presents seven first-hand accounts by university educators who reflect back on their early experiences teaching courses on food systems in the discipline of urban planning. Set within a specific global region — North America — the findings are relevant to other

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professions and academic disciplines grappling with the topic of food systems. The analysis points to tensions and opportunities related to the professionalization of this emergent field of research and practice.

### Introduction

The motivation for writing this article stems from discussions between the two principal authors, Joe Nasr and Wendy Mendes. Both Joe and Wendy have taught university-level food systems planning and/or urban agriculture courses since 2005.<sup>1</sup> Our courses have included both undergraduate courses and graduate seminars in face-to-face and internet-based formats. Early conversations about this topic revolved around changes we have observed regarding the willingness (or lack thereof) of different universities to mount courses on food systems topics, as well as around dramatic changes that we have encountered over the years in the knowledge and first-hand experience that our students bring to class; and of course, around our own pedagogical changes in response.

We quickly noted that a number of our colleagues in planning<sup>2</sup> programs across Canada and the United States who were also early adopters of food systems as a topic of instruction, would surely have similar observations. It was from these realizations that we felt that documenting the early experiences

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<sup>1</sup> Wendy Mendes first co-taught, at the School of Community and Regional Planning at the University of British Columbia, Vancouver, Canada, the course “Food Systems Policy & Planning” in 2005 (with Kristina Bouris — see her reflections later in this paper), and since then has continued to offer it alone. Joe Nasr includes an emphasis on urban food systems in several courses he has taught that deal with urban sustainability and environmental planning, at Bryn Mawr College, the University of Michigan, the University of Toronto, and the University of Western Ontario. They also co-teach several courses at Ryerson University (Dimensions of Urban Agriculture in Wendy’s case, Urban Food Security and Understanding Urban Agriculture in Joe’s case), although those who take these courses are not exclusively planning students.

<sup>2</sup> We are focusing here on urban, rather than regional or rural, planning. How food system considerations fit in regional planning or within the work of rural planners would differ from the examples cited in this paper, though many issues would be in common.

of university educators would serve as an important point of reference as we move forward into what is certain to be an era of unprecedented complexity for food system research and practice.

The paper begins with an overview of how food systems came to be decoupled from — and recently reconnected to — urban and regional planning. The approach used in this article is outlined next, along with a quick sketch of the seven experiences of university educators who here reflect on their early experiences teaching courses on food systems within the planning discipline. This is followed by an analysis of key themes and findings from the seven first-hand accounts that were commissioned from these educators (see appendix). The paper concludes with some thoughts on what this may suggest about current and future training for food systems professionals and scholars.

### Food as an Urban and Regional Planning Issue

Historically, cities and their food systems have been tightly linked, with urban populations depending on contiguous food production and distribution systems to sustain themselves (Steel, 2008). Even at the peak of the Industrial Revolution, these ties remained intimately connected, as exemplified by the intensive productive activities found in and around major cities of Western countries well into the first years of the twentieth century.<sup>3</sup> It is thus not surprising that several of the founders of the planning profession as it has come to be known today did not ignore the question of the food system in the theories they developed involving planned urbanization. We can cite here Ebenezer Howard’s Garden City (as the name itself implies), Patrick Geddes’ foundational ideas on regional planning, and Frank Lloyd Wright’s Broadacre City, to remind us of the centrality of the question of food systems in the thinking of early planning theorists.

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<sup>3</sup> For historical examples of urban agricultural activities, see Linder and Zacharias (1999) for Brooklyn, New York; Stanhill (1976) for Paris; and Lawson (2005) for American community gardens.

However, intensive rural-to-urban migration over the latter half of the twentieth century, combined with the rise of technologies including mechanized farming, long-distance food transportation, refrigeration and food processing, have resulted in the loss of local farmland and dramatic changes in land use patterns (Mougeot, 1994; Pothukuchi & Kaufman, 1999). The result has been a separation between cities and their food systems.

There are many signs that this disconnect is starting to be repaired. One indication is the existence of municipal food system instruments in a growing number of Canadian and US cities. Currently, Canadian cities with municipal food policy mandates (such as local food procurement requirements) and/or food policy councils<sup>4</sup> include Toronto, Ottawa, Kamloops, and Vancouver. In addition, food-policy initiatives led by nonprofit organizations, Social Planning Councils or Health Authorities now exist in almost every Canadian province and territory. American cities considered to be food policy innovators include Berkeley, CA, Portland, OR, Knoxville, TN, and Hartford, CT. Estimates are that over 100 cities, counties, regions or states in the US and Canada have established food policy groups to provide a systematic focus on food planning issues.<sup>5</sup>

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<sup>4</sup> A food policy council (FPC) is an officially sanctioned voluntary body comprised of stakeholders from various segments of a state/provincial or local food system. FPCs are collaborations between citizens and government officials that give voice to food-related concerns and interests. FPCs are asked to examine the operation of a local food system and provide ideas or recommendations for how it can be improved (Iowa Food Policy Council, 2005, 1; Dahlberg, 1994). For a comparative multicountry study of FPCs, see Schiff (2007).

<sup>5</sup> Around 100 food policy groups at the local, county, regional, or state level now exist in the United States alone, not all of them officially organized as councils under or within specific government jurisdictions. Some are networks, coalitions, etc., and may not have any formal relationship to government other than their interest in influencing food and agriculture policy (personal communication, Mark Winne, Food Policy Council Program Director, Community Food Security Coalition, 15 Nov. 2008). In the Canadian context, the *People's Food Policy Project* (2009) documents dozens of food policy organizations currently active at municipal, provincial, and federal levels. See

Food system issues affect the ways that people in cities produce, obtain, consume and dispose of their food. Food decisions impact whether opportunities to grow food in the city are supported, whether a city's most vulnerable populations have access to nutritious and affordable food, whether neighborhoods have grocery stores or farmers' markets within walking distance, or whether domestic waste will overwhelm municipal landfill capacity. Recent decades have seen increased municipal support for food-related initiatives (IDRC & UMP, 2003; Mendes, 2006, 2007, 2008), which can include creation of new community gardens, use of farmers' markets as catalysts for neighborhood development, siting of food outlets in order to serve lower-income groups, introduction of community kitchens, adaptation of emergency food programs into multifaceted food-security responses, promotion of food-waste diversion strategies, and nurturing of food policy councils.

These types of initiatives have a host of implications for planners, and they align with their roles and responsibilities (Quon, 1999). The attention now being paid to food system issues by planners fits as part of the emergence of strong interest in such issues by a range of urban professionals including architects and landscape architects (Centre for Studies in Food Security, 2008; Gorgolewski, Komisar, & Nasr, 2011; Komisar, Nasr, & Gorgolewski, 2009; Viljoen, Bohn, & Howe, 2005).<sup>6</sup>

A growing number of planning scholars and practitioners are developing food as a specialty, engaging in food planning research, writing new publications on the subject, and developing university courses that focus on aspects of the food system. The claim that food is a legitimate area for planner intervention has been strengthened through several plans and publications since Pothukuchi and Kaufman's observations about planning having overlooking food systems (1999).

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<http://www.peoplesfoodpolicy.ca/canadian-food-policy-organisations>

<sup>6</sup> See also [www.carrotcity.org](http://www.carrotcity.org).

In 2004, two special issues on food planning appeared in planning journals, *Progressive Planning* and the *Journal of Planning Education and Research*. Subsequently, food systems have gotten increased attention as a somewhat regular topic in planning journals.

Within universities themselves, the rapid adoption of courses focusing on food systems is now starting to transition to the creation of new academic positions with a specific focus on food systems research and practice. York University (Toronto, 2007), Maryhurst University (Portland: OR, 2011), and the University of Michigan (Ann Arbor, 2011), have hired — or are in the process of hiring — faculty members with a food systems background to complement existing programs in planning, environmental studies, and related fields. The creation of these positions signals a shift in the perceived legitimacy of food systems issues, and their importance as aspects of the professional formation of future planners and related practitioners.

Evidence of growing interest in food issues among planners can also be seen in the creation of two e-mail listservs, both emerging after planner conferences. One, consisting of approximately 350 planners, academics, and practitioners, has been in existence since March 2005 (Foodplanning, n.d.). Another is a community of practice of about 100 planners created after the World Planners Congress in Vancouver in 2006 (Planning for Agriculture & Food Network, n.d.; *Planning for Food*, 2006).

At the level of professional associations, food as a planning issue is getting acknowledged more systematically, as illustrated by the American Planning Association (APA). The 2005 APA Annual Meeting marked the first time that dedicated food-planning sessions were organized. Food systems were covered in APA publications for specific audiences, including the newsletter of the Environment, Natural Resources, and Energy division (Kaufman & Glosser, 2006b) and the newsletter of planning commissioners, *The Commissioner* (Kaufman & Glosser, 2006a). A food planning White Paper was developed in 2006 (APA

Food System Planning Committee, 2006) and the subsequent Policy Guide on Community and Regional Food Planning received formal approval in April 2007 (APA, 2007). In September 2008, the APA released a Planning Advisory Service report on Community and Regional Food Planning (Raja, Born, & Kozlowski-Russell, 2008), followed by one on Urban Agriculture (Hodgson, Campbell, & Bailkey, 2011). The APA is also currently undertaking a project to “identify and evaluate... food access goals in comprehensive and sustainability plans across the US... [and] provide policymakers and planners with case examples of innovative food access goals and policy development” (American Planning Association, 2011).

The recognition by the APA of food system planning marks a significant shift in the perceived legitimacy of food as a planning issue in North America and elsewhere. This trend is getting stronger. A proposal for a standing interest group in AESOP (Association of European Schools of Planning) was accepted, leading to conferences on food system planning in the Netherlands in 2009 and in the UK in 2010 and 2011. Add to that the inclusion of food as a topic of community plans — either as a sole focus or as a component or consideration in larger plans — and it is clear that food is now on the planners’ table.

Reasons cited for the heightened awareness among planners of the significance of the food system include the great amount of land used for food system activities, the rising incidence of hunger and obesity, the place of the food system in community and regional economies, the challenges of accessing healthy foods in low-income areas, and the continued loss of farmland in metropolitan areas at the same time that a movement for local food is growing (APA, 2007). Significantly, the reasons cited for engaging in food system planning often contain inflections of sustainability concerns, such as global food “insecurity,” high emissions due to long-distance food transportation, loss of farmland, the rise of diet-related diseases, and other global food system vulnerabilities. This points to food policy as an issue with many dimensions: local (e.g., grocery store location, food waste disposal,



opportunities for urban agriculture, emergency food distribution, development of the local food economy); regional and national (e.g., public health, nutrition, agriculture, natural resources, fisheries); and global (e.g., international trade agreements, impacts of climate change on agriculture) (Dahlberg, 1999).

This range of issues and geographies points to the central significance of globalization in food system issues, while the issues still often remain firmly rooted in the immediate concerns of people's home communities. Attention to the immediate concerns of citizens is reflected in the common association of food system issues with strong citizen participation, inclusiveness, and cross-cutting approaches to improved quality of life that bring simultaneous benefit to the economy and environment, and to nutrition, food security and public health (Argenti, 2000; Bouris, 2005; FAO, 1998, 2000; Mendes, 2007, 2008; Rocha, 2001; Smit, Nasr, & Ratta, 2001; Wekerle, 2004; Welsh & MacRae, 1998).

Many cities in the global south have for many years been proposing solutions to urban food system vulnerabilities, often in response to crisis levels of hunger and poverty.<sup>7</sup> While the development of analytical frameworks to facilitate comparative research and information sharing between cities in the developed and developing world is paramount — given the lack of data available to assess different processes, mechanisms, and outcomes — for the purposes of this paper, a close examination of urban food system issues in the developing world is beyond the scope of this project. Similarly, while a growing literature on food systems planning is emerging in Europe,<sup>8</sup> Australia, and elsewhere, the emphasis in this paper will be on the North American context, which is sufficiently distinctive to warrant attention on its own.

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<sup>7</sup> See, among others: Argenti (2000); Dubbeling (2001); FAO (1998, 2000a, 2000b); IDRC and UMP (2003); Lang (1999); Mougeot (2000); Rocha (2001); Ratta & Nasr (1996).

<sup>8</sup> One center of interest in food systems from a planning perspective can be found at Cardiff University in the U.K. See for instance Morgan, Marsden, and Murdoch (2006) and Morgan and Sonnino (2008).

Moreover, although an urban emphasis is maintained in this article, planning for food systems in rural regions is also vital; but the context for rural planning differs substantially from urban areas and it responds to very different needs, though complementarities in planning for urban and rural regions clearly exist. It is hoped that others will take on the challenge of considering questions around the pedagogy of food systems planning in rural areas and in other world regions.

By focusing on the concerns around urban food systems, in a specific global region, this paper examines in detail the pedagogical challenges and opportunities associated with a topic that, although gaining acceptance, remains contested and far from universally accepted as a legitimate activity for the planning profession. In this way, the findings of the analysis are transferable to other nascent issues that are being addressed in education and practice in planning and other urban-focused disciplines, although still in positions of relative marginality.

One of the benefits of reflecting back in time, if only five years, is that it provides the opportunity to consider how much has changed in a relatively short period of time. What is clear is that the rapid transformations in planning knowledge and pedagogy suggest that the food-systems issue for urban planning and related disciplines is set to evolve even further in coming years and decades. One way to document and examine the challenges and opportunities inherent in the professionalization of this emergent field<sup>9</sup> is through first-hand accounts by planning educators who have taught courses on food planning. It is to these first-hand accounts that this paper now turns.

### **Reflections of Food System Planning Educators**

Contributors were invited by the principal authors of this article to provide a 1000-word reflection on their early experiences related to teaching about food system issues. Contributors were selected on

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<sup>9</sup> For an analysis of this professionalization, including examples of individual designers and planners who are now specialized in food systems, see Nasr and Komisar (in press).

the basis of representativity and convenience.<sup>10</sup> The purpose of the focus on early teaching experiences was to highlight the contours of transformation over time in pedagogy, as well as the resistance (or lack thereof) from colleagues and administrators at the universities within which the courses were taught. Each contributor was provided with the same broad set of overarching questions.<sup>11</sup> Contributors were encouraged to

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<sup>10</sup> While convenience sampling has limitations where replication and extrapolation are concerned, in the case of this study it is an appropriate methodological decision for the following reasons. First, due to the specificity of the topic, the total pool of possible contributors is relatively small. The contributors were among the few early teachers of food system courses in planning schools. Even if a randomized methodology were adopted, it would likely have yielded similar — if not the same — participants. In this sense, a targeted approach is appropriate. This is not to suggest that issues of underrepresentation should not be considered in future studies. Second, the stated purpose of the study is exploratory, making controlled, random sampling less relevant. Third, the contributors were known to the principal authors, who considered the particular experience of each one worthy of inclusion and analysis. Moreover, these experiences were meant to represent specific profiles that the principal authors felt appropriate for highlighting; thus the selection was not random and based on convenience alone.

<sup>11</sup> The questions were:

- What is the title and main focus of the food course you taught (or teach), and was it (or is it) taught in a planning school or another department?
- How did you come to propose and teach the course? What or who inspired you?
- What specific contributions do you feel it makes to the planning curriculum and to preparing the planners of tomorrow? Are there other benefits?
- How did you “sell” the course? Was it a struggle to mount it? Was it a challenge to attract students? If so, please tell us about these or other challenges.
- Because food is a nontraditional planning issue, did you (or do you) adjust your teaching methods? If so, how and why? Is there anything about the topic itself that changed your pedagogical approach? Did you seek to treat it (or make it appear) as a traditional planning issue?
- How do you feel the course is perceived by colleagues and students in your planning school or department? Does it complement other offerings in your planning school or faculty? Do you think it has broadened perceptions about emerging planning issues?
- How would you describe the pre-existing knowledge of your students of food issues? Were you teaching to the converted?

respond to those questions that most strongly resonated with them. In addition, depending on their particular experience or position in academia, each contributor was given additional specific questions to consider in their response.

The intention was not to conduct a standardized survey. Rather, a qualitative methodological approach was taken, with the aim of highlighting the unique contexts and narratives of the contributors, and allowing themes to emerge that may have been missed in a more empirical approach. Together, the contributions provide a rich set of first-hand insights on a number of benefits and challenges related to teaching emerging planning issues to future planners. The full contributions are provided as an appendix to this article, to provide the full reflections in the authors’ own voices. In this section, we will briefly outline the settings for these seven experiences. This will be followed in the next section by a synthesis and analysis of key themes from the seven contributions.

- **Gerda Wekerle, Professor in the Faculty of Environmental Studies and Coordinator of the Planning Program, York University, Toronto:** Gerda Wekerle describes the Faculty of Environmental Studies (FES), her base at York University, as an early adopter of teaching and research on “emergent” public policy issues that require an “interdisciplinary bridging of fields and disciplines.” In keeping with this lineage, Wekerle cites food studies as one in a series of topic areas that were not yet on the broader public agenda when first embraced by FES. Wekerle credits FES’s interdisciplinary, “student-centered” approach to learning with the ability to create an environment in which students can innovate by incorporating food issues into papers, projects, and internships, as well as the ability to blur the boundaries between academic research and activism. Of particular interest to Wekerle are the strong partnerships and collaborations between the university and food-focused community services agencies that have resulted from this approach.

- **Jerome Kaufman, Emeritus Professor, Department of Urban and Regional Planning, University of Wisconsin-Madison; and Marcia Caton Campbell, Milwaukee Program Director, Center for Resilient Cities:** Jerome Kaufman's role<sup>12</sup> as a pioneer in the study of emergent planning issues that took time to become recognized within the field, can be traced back several decades. For Kaufman, his collaboration in 2001 with Marcia Caton Campbell to teach the first class on community food planning in the Department of Urban and Regional Planning, University of Wisconsin-Madison (UWM), marked yet another foray into a topic that was, at the time, "decidedly on the back burner of planning practitioners." Like Wekerle, Kaufman and Caton Campbell note strong connections between food systems and community-based service initiatives, including student-led community food assessments and other forms of food-related service learning. Reflecting on ten years of food systems planning at UWM, Kaufman and Caton Campbell note the number of students who have "carried their food planning interests into their professional lives as planning practitioners and consultants." They also reflect on the opportunities presented by the topic of food systems to facilitate interdisciplinary research and practice.
- **Kami Pothukuchi, Associate Professor of Urban Planning, Wayne State University:** Kami Pothukuchi insists that the topic of food offers an exemplary means for planning students to understand the "interdisciplinary and multi-systems nature of urban policy/planning issues." Pothukuchi's experience teaching a "Cities and Food" course in the urban planning program and researching food systems topics at Wayne State University evolved from her experience studying food topics as a

graduate student, then later as a visiting faculty member at the University of Wisconsin-Madison, where she co-taught a graduate seminar on urban food systems with Jerome Kaufman. While emphasizing the many opportunities presented by food systems teaching and research — in particular, an inclination towards community-based service learning — Pothukuchi identifies a number of "structural challenges" that continue to impact her work in the field of food systems planning. She notes difficulties attracting outside research funding, challenges for junior faculty in embracing what remains a "non-traditional" planning topic, and the considerable time required to maintain partnerships meaningfully with community organizations.

- **Branden Born, Associate Professor, Department of Urban Design and Planning, University of Washington:** Branden Born combines the perspectives of student, researcher, and teacher in food system planning. Discovering the topic as a graduate student in the previously mentioned seminar taught by Kaufman and Pothukuchi at the University of Wisconsin-Madison in 1996, he saw the need to incorporate food systems into planning curricula. The experience "solidified my interest in offering such a class at my eventual home institution, the University of Washington," where he now teaches "a regular biannual class entitled Urban Planning and the Food System." While cautious at first in emphasizing his interest in food issues as a new planning faculty member, he found relatively little resistance in his college and department to this interest, which was seen as valuable. His regular class now contributes in several ways to the departmental curriculum, filling a demand niche. Ultimately, Branden found that his primary interest and focus on planning process "has been nicely manifested in my food system studies" and "my experience as a student helped me in developing the course and building legitimacy in my expertise in the subject area."

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<sup>12</sup> This contribution represents both Jerome Kaufman's personal reflections and joint reflections with his former colleague Marcia Caton Campbell, due to their close collaborations on design and delivery of food systems courses.

- **Kristina Bouris, Community Planner, City of Victoria, British Columbia:** Kristina Bouris was a newly minted planning school graduate in 2005 when she co-taught (with Wendy Mendes) the first graduate course in food systems policy and planning offered at the School of Community and Regional Planning (SCARP) at the University of British Columbia, asking two central questions: (1) What can local government planners do to facilitate local food systems?, (2) What does it take to get the food system on the municipal agenda in the first place? Bouris identifies a number of enabling factors that led to the course being offered in the first place, such as SCARP's mission to "advance the transition to sustainability planning" (of which food systems were understood to play a part), and a (now former) director and faculty member who supported that mission. As with Wekerle's experience at York, Bouris also points to the culture of "innovation and experimentation" at SCARP, where there was pre-existing experience mainstreaming other non-traditional planning issues. Bouris also cites the uniqueness of having a group of graduate students interested in sustainability and food issues who effectively lobbied the School Director for the course.
- **Timothy Beatley, Teresa Heinz Professor of Sustainable Communities, Department of Urban and Environmental Planning, School of Architecture, University of Virginia:** Timothy Beatley began teaching in 2006 (with Tanya Denckla Cobb) a community food systems class at the University of Virginia that is now regularly offered. The course combines "substantive introduction to the theory and practice of community food planning" with "hands-on workshops" that apply ideas and theory to the local region. In keeping with the experience of other contributors, Beatley's combination of theory with applied practice has resulted in real world applications and outcomes, including community food assessments, policy recommendations, and other "beyond class" outcomes,

including the creation of a new local food organization. Beatley reflects on the extent to which sustainable food systems and community food systems are powerful avenues for "teaching about community sustainability and sustainable place-making." "Food," Beatley insists, "provides entry to every aspect of community sustainability." Ultimately, "reinvigorated local sustainable food systems represent a potentially powerful form of community building, and a way to profoundly strengthen and revive our place commitments."

- **Barbara Lynch, Professor, Sam Nunn School of International Affairs, Georgia Institute of Technology (formerly at Cornell University):** Barbara Lynch came to teach about urban and rural food system issues through Cornell University's Rome Program. The program serves undergraduate students in architecture, art, and planning, with a small number from the humanities and social sciences. Lynch describes how in-depth neighborhood-based research on food topics in an international setting, through a planning workshop she offered in 2006, allowed students to consider not only the specificities of Rome food system issues and challenges, but to transfer this knowledge to consider food system issues in other global contexts as well. Of particular interest to Lynch is the issue of inequal access to good quality food — a truly international issue — which served as a key entry point and organizing issue for the course. Lynch believes that through the course students "gained a new consciousness about the centrality of food to national culture, social integration, and well-being."

### Key Themes and Findings

One of the primary reasons for documenting and analyzing the early experiences of university educators who teach food systems issues is to identify challenges and innovations as we move forward into an increasingly complex global context for food system research and practice. By reflecting on the recent past, and the issues

**Table 1. Themes Emerging from Contributors' First-hand Narratives: Connections Between Teaching About Food Systems and Related Issues**

	Wekerle	Kaufman/ Caton Campbell	Pothukuchi	Born	Beatley	Bouris	Lynch
Awareness of difference and diversity			✓				✓
Stakeholder involvement in planning processes		✓				✓	
Awareness of broader governance context of planning		✓				✓	✓
Links between globalization and planning education	✓		✓	✓	✓	✓	
Connections drawn between food systems and sustainability principles in planning	✓		✓	✓	✓	✓	

encountered, we can better prepare ourselves for current and future training of food systems professionals and scholars. This section of the paper summarizes themes identified by contributors that emerged from their early teaching experiences. Table 1 summarizes connections between teaching about food systems and related issues which contributors felt provided further context or enrichment to their pedagogical approaches.

Two themes almost unanimously addressed by contributors were the links drawn between education on food system planning and the issues of globalization, and the issues of sustainability. This is worth reflecting on, in light of the increasingly complex geographical, cultural and socio-political environments in which food system issues are addressed by planners and others. Awareness of issues related to globalization combined with adoption of principles that underlie sustainability thinking, as well as development of inter-cultural skills as a core competency of food system professionals, can be expected to be central as urbanization becomes even more complex and fragile. Born states: “As a field, planning is

designed to consider the long-term perspective. As sustainability and large issues such as global climate change and global health come to the fore, planners need to be aware of the sea change and move beyond limited considerations of land use or design and begin applying those skills to a broader set of more global considerations.” For Bouris, the sustainability framework for her course “provided the freedom to explore a broad range of sub-themes related to the food system.”

Beatley concurs that “community food systems are wonderful avenues for teaching about community sustainability and sustainable place-making.” He refers to “the power of food as a way of connecting us to place and to making tangible sustainability issues and concerns.” Ultimately, for him as for other contributors to this article, “reinvigorated local sustainable food systems represent a potentially powerful form of community building, and a way to profoundly strengthen and revive...our collective commitments to the landscape and community that ultimately sustains.”

Interdisciplinarity and innovation<sup>13</sup> will be required to address emergent societal issues. Pothukuchi begins her contribution with this statement: “Food offers an intuitive and immediate feel for the interdisciplinary and multi-systems nature of urban policy/planning issues.” Reflecting on the experience of York University’s FES, Wekerle remarked that “students are decades ahead of the academic community in identifying public policy issues that are emergent and benefit from an interdisciplinary bridging of fields and disciplines, as seen particularly in the fast-growing area of food studies.” Bouris uses the example of the range of guests in the class she co-taught — including a policy planner, social planner, neighborhood planner, land-use planner, rural planner and environmental planner — to show that “the food system cuts through the silos of traditional municipal planning practice.”

Moreover, numerous students (many of whom are activists on and off campus: Wekerle observes that “FES has tended to attract activist students who have a commitment to community service”<sup>14</sup>) expect that their work will consist of applied action research. The confluence of research and practice is particularly fertile within food systems issues, and the pedagogical context of planning schools is especially well suited as a setting for this confluence. In Born’s case, the service learning approach was reflected in the major assignment, “a client-driven paper that assisted a local food system entity.” The integration of “service learning” into Kaufman and Caton Campbell’s teaching offers another good example, with students “contributing ten hours of volunteer time to a food-related

community organization over the course of the semester and writing reflectively upon that work.” Similarly, Beatley states that “food courses and teaching...seem especially potent as community catalysts.” He observes that, after a presentation by students of findings from their course at Charlottesville City Hall, “the group in attendance collectively shrugged ‘what do we do now’ and on the spot, a new local food organization was hatched. Called E.A.T. Local (Everyone at the Table), this group met for several years, and continues to function as an important virtual community and communication vehicle, helping to hatch a number of local food projects and initiatives.” In the case of Pothukuchi’s experience at Wayne State with her “Cities and Food” course, after it struggled in its initial years to attract enough students, only after she strengthened the service-learning aspects of the course in 2008 did it develop consistent enrolments from students from a range of departments.

At the same time, exposing students interested in food concerns to “faculty members whose primary expertise is not food studies but...[who] have been supportive of student work on food and agriculture...pushes the boundaries of food studies while, at the same time, developing broad support for it.” Thus, “food and agriculture studies have been...mainstreamed rather than enclaved into a designated program or department” (Wekerle). Kaufman and Caton Campbell similarly observe, “community food planning offered synergies in research and professional collaboration with colleagues from other departments.”

In addition to the themes identified above, other crosscutting themes can be discerned in the seven contributions — themes that relate to the pedagogical experience itself, its enabling context and its impacts. Some of these concern specific challenges that were confronted in teaching the food planning courses, or, conversely, the opportunities that such teaching opened up. Other themes relate to benefits that teaching about food offer to student learning. Table 2 analyzes some of these additional themes.

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<sup>13</sup> A number of pioneering studies that have been emulated by community and governmental organizations were undertaken by planning students within a class setting. Three can be cited for illustration: the study of food security in Los Angeles led by Bob Gottlieb at Occidental College in the mid-1990s; Kaufman and Pothukuchi’s studio at the University of Wisconsin–Madison in 1996; and the Diggable Cities study at Portland State University in 2005–2006, a pioneering inventory of land potentially usable for urban agriculture.

<sup>14</sup> This differs from Pothukuchi’s experience, in which only a small minority of students in her Food and Cities course tend to be activists.

**Table 2. Additional key themes identified by contributors: Pedagogical setting, experience and effects**

	Wekerle	Kaufman/ Caton Campbell	Pothukuchi	Born	Beatley	Bouris	Lynch
Challenges of legitimacy or academic credibility for instructors as a result of teaching food planning course		✓	✓	✓			
Impact of departmental culture on ability to mount food planning course (i.e., climate of innovation or conservatism)	✓	✓	✓	✓		✓	
Ability to “brand” a planning department as a destination school for food planning	✓	✓		✓			
Impact of “pioneers” in enabling ability to teach food planning (i.e., legitimacy)	✓		✓	✓		✓	
Food planning course resulting in catalytic effect in community/ community-building/activism/ social awareness	✓	✓		✓	✓		✓
New/wider career paths introduced to students	✓	✓		✓			

Table 2 shows that there are recurring challenges, as well as opportunities, across the various experiences shared in this article. The challenges may be largely structural and institutional in nature. Pothukuchi identifies three such challenges:

- Difficulties with obtaining outside funding for research on a new topic that does not squarely fall within traditional funding categories or funders’ missions
- Isolation as a junior faculty in a department and university context where colleagues in related interdisciplinary fields were hard to find (say, in public health or environmental studies)
- The nature of an emerging field of practice in which research questions, contextual understanding, and identification of key actors necessitate active involvement in ongoing policy and grassroots efforts,

which “posed opportunity costs to time for research and writing.”

If, indeed, institutional resistance is not uncommon when launching a course on a non-traditional planning subject such as food system planning, it is pertinent to learn more about such resistances to innovation in academic planning curricula — if for no other reason than to better prepare the faculty member, especially if he or she is junior faculty, for the risks faced in putting forward such a course. Such risks are evident in several of the contributions in this paper. Caton Campbell was “initially discouraged by some of her new colleagues from joining Kaufman in what they viewed as a boondoggle.” Pothukuchi notes that, in the early years, faculty colleagues in her department did not recommend (and in some cases, recommended against) her food-focused course to their advisees.

To learn more about these reactions, one would have to dig further into the explanations for such resistance. Why would some faculty members (or

students for that matter) be opposed, or at least skeptical, about planners reaching into “new” areas such as food? While this paper cannot begin to address such questions (since it is based on experiences of those who taught, not those who resisted the introduction of such teaching into the planning curriculum), it is hoped that other researchers will take on this challenge.

While this paper can only provide indirect allusions to what may explain the marginality of certain areas such as food within the planning profession, we can at least identify some clues from the experiences here shared about what might reduce this marginality. Contributing factors to the shift from doubt to acceptance of food issues in teaching planning include presence of champions in the department, the level of collaboration that takes place to avoid isolation of a “foodie” planner (whether faculty member or student), high level of student interest, potentials that are perceived as assets (for bridging, for funding), and promise for career enhancement (i.e., indications that food is an area that can lead to tenure/promotion). One example of the potential for bridging is shown in the presentation that took place at the end of Kaufman and Caton Campbell’s course to an “invited audience of approximately 40 city and county planners, local government officials, professionals working in food-related agencies and nonprofits, and interested students and faculty.” Another is the significant food dimensions in some formal partnerships the City of Vancouver recently set up (e.g., Greenest City Scholars, CityStudio).

Several contributors emphasized the use of different pedagogical approaches in their food-focused courses. The community food systems class Beatley co-teaches works “both as a substantive introduction to the theory and practice of community food planning, as well as a hands-on workshop class applying these ideas and theory to our own local region.” Pothukuchi also highlights “hands-on elements to course delivery, including participant observation by students of the workings of a community-food site.”

Food system courses can offer lessons on the place of food in society. Lynch says of the workshop she led in Rome for Cornell students, “all students in the workshop — not just the “foodies” — had a greater appreciation of how food moves from producer to consumer, and what happens to it along the way... On the whole, the class seemed to have gained a new consciousness about the centrality of food to national culture, social integration, and well-being.”

Conversely, Bouris emphasizes the relevance of food as a learning instrument for future planners. “The course was designed to use the food system as a vehicle to teach students about the legislative, political and institutional context of local government in Canada, and the tools and techniques available to planners — regardless of the issue at hand. We spent a lot of time on the basics, explaining the roles and responsibilities of local government planners... It is hard to argue that planners should ‘do’ more for the food system if there is little understanding of what planners ‘do’ in the first place.” For Bouris, “planners need an understanding of complex, high-level, heady issues, as well as a firm grasp of the tools, techniques, processes and dynamics in their midst.”

According to Born, his class “contributes to the departmental curriculum in several ways. Primarily, it builds knowledge of food systems for future professionals, offering a marketable skill set and connections for future job opportunities. The class also fills a demand niche; students in our department are very interested in the linkages between planning and the food system. The class has become something that the department can sell as a special offering, making the program more attractive in a competitive landscape of planning schools. Students have also benefited beyond the pedagogy and long-term job opportunities through a variety of funded and non-funded research and teaching opportunities. Finally, the class helps to prepare students to think about the emerging issues for society generally and planning specifically.”

The work opportunities offered by food systems courses should not be underestimated in the



current economic conditions. Pothukuchi points out that “these days in the Detroit region, new graduates are finding more employment opportunities related to community food planning than in practically any other sector; many of our students have successfully taken on such positions or incorporated related elements in their jobs.”

### Conclusions

Today, we can conclude that the food system is no longer “a stranger to the planning field,” as Pothukuchi and Kaufman claimed in their seminal article on the subject (2000). As Kaufman and Caton Campbell observe, food system research is now “well integrated into the curricula of many planning schools...recognized as an appropriate arena for theoretical inquiry as well as empirical research,” and considered important by the professional planning community (Kaufman and Caton Campbell). In their specific experience, Kaufman and Caton Campbell found that “our course was legitimated at the planning department level among its originally skeptical faculty both by the students we succeeded in recruiting to our program and by the community food planning research and activism that we engaged in outside the classroom and in the community.”

As a result, the idea that food has a “place on the table” of planning, so to speak, is no longer strange and easily dismissed. This shift has been quite dramatic, in a short time span. This said, however, one should not overstate how far food has managed to entrench itself in training for planning and other urban-focused professions. No one can make the claim that most planning offices nowadays engage in food system planning in the same way that they do, say, transportation planning or land-use planning — a problematic situation, considering that many of the most formidable challenges of urbanization in the current global context, whether climate change, peak oil, or hunger and obesity crises, are undeniably food system issues.

Until food systems become more established as an area of practice, “students have to become well-educated planners who can bring food planning

into the planning conversation as food continues to be seen as a critical issue in urbanized areas” (Wekerle). Similarly, Kaufman and Caton Campbell found that, while some students wanted to work specifically in food planning, “most wanted to follow more traditional job paths in planning, but with a desire to expand their prospective colleagues’ horizons about the benefits of supporting local and regional food systems.”

The central issue in the present paper is not, however, whether we have gone a long way or only a little way in that direction. The focus here is neither planning discourse nor planning practice — it is planning pedagogy. The literature that has started to emerge on food in planning has largely not touched on the pedagogical aspects.<sup>15</sup> Beyond merely examining how food systems are being taken up in planning education, this paper offers additional contributions lacking in the literature. One benefit of our study is its unusual format and perspective. Specifically, it foregrounds first-hand accounts of planning educators who have taught courses on various dimensions of food policy and planning.<sup>16</sup> This approach allows a richer set of insights to be gained about how and why planning educators have sought to teach food policy, what strategies they used, what professional and institutional challenges they faced, and what benefits their students may have gained.

Food policy provides the opportunity to examine how planning educators may be using such multifaceted issues as vehicles to teach future planners to approach urban problems using a more holistic lens, and to consider the sustainability of the solutions to these problems. For instance, urban agriculture strategies can be undertaken by

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<sup>15</sup> Janet Hammer’s JPER article (2004) is a notable exception, but it is a very different paper from this one, as it is based on a survey of course syllabi rather than teaching experiences.

<sup>16</sup> Another set of reflections that would be worth exploring in a different paper is the experience of students (both “foodies” already interested in food system issues, and others just discovering the subject) in taking a course focusing on an emerging issue like food for the first time, or even choosing to make food systems their specialization during their planning studies.

planners not only with the goal of strengthening food availability and improving nutrition, but equally to enable social cohesion and economic opportunities for urban gardeners, reduce the distance food travels from seed to table, improve urban air quality, and create vibrant neighborhood gathering places for all citizens (Mendes, 2007, 2008; Mendes, Balmer, Kaethler, & Rhoads, 2008; Smit, Nasr, & Ratta, 2001; Wakefield, Yeudall, Taron, Reynolds, & Skinner, 2007). In this way, multiple uses and multiple outcomes are assumed, as are links between local and global pressures. Because of their inherently interdisciplinary and integrative as well as multisectoral and multi-actor nature, food systems as a planning issue offers a model from which to learn about how best to respond to complexity and diversity in planning

problems and their solutions. In raising questions where they apply planning theories and approaches to food, planning students “highlight how food studies can benefit from a broader planning perspective, as well as how planning may be enriched by an emphasis on food and agriculture” (Wekerle).

Together, the combination of historical contextualization, first-hand accounts, and analysis of key themes contribute much needed insights into the challenges and breakthroughs associated with exploring what Bouris refers to as the “delicate forces that create and shape an emerging planning issue” like food systems, and with incorporating it into planning pedagogy and knowledge.



## Appendix: Seven Reflections

### Contribution #1:

#### A Student-Centered Focus on Food: York's Faculty of Environmental Studies

Gerda R. Wekerle, Professor in the Faculty of Environmental Studies and Coordinator of the Planning Program, York University, Toronto

The Faculty of Environmental Studies (FES), York University took in its first graduate students in 1969. Since then, we have often found that students are decades ahead of the academic community in identifying public policy issues that are emergent and that benefit from an interdisciplinary bridging of fields and disciplines, as seen particularly in the fast-growing area of food studies.

In 2007, we hired our first tenure-stream, full-time appointment to teach courses on food. With agronomy and political ecology in his background, this faculty member, Rod MacRae, was a food systems policy consultant and coordinator of the Toronto Food Policy Council (TFPC). This experience links our students directly to the rapidly evolving and multi-sector Canadian food systems planning community. We now offer three courses on food in FES, at the undergraduate and graduate levels, one of which is Food, Land and Culture.

FES first attracted students to food studies 35 years ago. In 1973, three master's students completed major research papers: Conservation and Foodstuff Production, Basic Soil Ecology and Chemical Fertilizers, and Population Growth and the Problem of Food Supply. From 1973 to 2005, 118 master's students, supervised by more than 20 different faculty members, completed major research papers on a broad range of topics that were integrated into most of FES's key areas of teaching and research. These include student field work on food and agriculture in the Global South, focused on topics such as cooperatives and agricultural development in Tanzania; farming systems and eco-development in dryland Africa; urban agriculture in Jakarta and in Kampala; smallholder coffee production in Indonesia and

Costa Rica; feeding and humanitarian aid in Africa; and food security and refugees. Students focusing on food and agriculture in the Global North have chosen topics that include food policy and community gardens in Toronto; design for rooftop gardens; nutrition and community kitchens; health benefits of school breakfast programs; medicinal plants and community health; migrant farmers; food banks and waste management; educating new farmers in Ontario; and feminism and farming and ethics in agriculture.

A PhD program was introduced in 1991. The first three completed dissertations focused on agricultural biotechnology and the environment, environmental risk assessment of GMO canola, and seed saving. Nine PhD students are currently focused on food issues, including an emphasis on women and food and on farmers' movements in Europe and Latin America.

#### Leadership and Activism

FES has tended to attract activist students who have a commitment to community service. As final projects for undergraduate theses and master's research papers, our students have established a number of school gardens, children's gardens, and community gardens in Toronto and its suburbs. The first fair-trade coffee shop in Toronto, Alternative Grounds, started as a final paper by one of our Masters in Environmental Studies students. After FES was gifted a rain forest in Costa Rica as a research centre, Las Nubes, students worked with local farmers to promote shade-grown coffee. Students and farmers developed and marketed a new product that is sold through Timothy's, a Toronto coffee chain, and is widely publicized at the York University coffee shop.

One of our graduate students developed a curriculum for new farmer training that she tested on interns at organic farms in the region, and which continues to be used. Another graduate student developed a prototype rooftop garden for FoodShare's warehouse in downtown Toronto that evolved into their very successful rooftop food-growing area. A group of our students organized an alternative organic food service on the York campus to challenge the prevailing corporate food provider, running it for almost ten years while creating student employment. Our students also persevered to gain administration commitment for a community garden on campus, the Maloca Garden, which is still going strong.

### **Planning and Food**

Interest in planning and food at FES is relatively recent, emerging since about 2000. We have a large planning program — about 40-60 masters students every year. In 2003, we graduated the first three planning students whose interests focused on food. One focused on urban growth and agricultural land reserves, the second studied visual media in food system planning, the third studied a rural organization in Mexico that linked farmers and urban consumers. In 2004, three more planning graduate students focused on rural wine tourism and conservation of rural character, faith communities and food justice, and urban agriculture in Havana and Toronto. In 2006-2007, about six planning students focused on food and agriculture. About one-third of the students in the planning program (and a sixth of the masters students in FES) currently concentrate on food issues.

Within the planning program, students have incorporated food and agriculture interests into studio projects. For example, the redevelopment proposal for a military housing site near the university included a plan for a community garden and farmers' market. A studio that developed a plan for a city public works site incorporated land for a market garden and farmers' market.

Students have also benefited from international research opportunities, such as a long-term project we had in Indonesia in which both Canadian and

Indonesian students focused on urban agriculture. As part of the Canadian Urban Institute's international internships, one student went to Jamaica in summer 2008 to work with a potato cooperative. Two of our MES students have been recipients of the prestigious Agropolis award for graduate study from the International Development Research Centre in Ottawa. Our graduates have formed the backbone of the food security and urban agriculture movement in Toronto and other parts of Canada, providing leadership in food agencies and opening up new areas of practice.

### **How Do You Build a Field When None Exists?**

Prior to the emergence of food studies as a field, the Faculty of Environmental Studies attracted students who had identified food and agriculture as a pressing issue. They had nowhere else to study this area. FES's masters program is structured around student-centered learning: students work closely with a faculty advisor to design their own academic plan that outlines learning objectives and the strategies to achieve them, combined with extensive one-on-one mentoring. Students are able to incorporate food issues into papers, projects and internships, as well as to take courses in other academic units and universities. Through such a student-centered learning program, we have found that students are innovative in identifying emerging issues in food studies. Their research and community projects often contribute innovative approaches and new knowledge.

Food and agriculture studies have been spread throughout our large program and mainstreamed rather than enclaved into a designated program or department. Faculty whose primary expertise is not food studies but areas such as tropical ecology, critical development studies, conservation, health, social movements, and planning, have been supportive of student work on food and agriculture. This pushes the boundaries of food studies while, at the same time, developing broad support for it.

Partnership and collaboration have been important, both with other universities, especially Ryerson and the University of Toronto, and with community

agencies. For the past seven years, the three universities and the TFPC have jointly organized and funded a yearly speakers' series, Food for Talk, to provide a resource for all our students and a forum for academics and community agencies to meet. Every two years the series hosts a graduate student colloquium on food. Students in FES have benefited immeasurably from on-going and long-term relationships with community agencies such as FoodShare and The Stop Community Food Centre. These have provided opportunities for volunteer work, paid internships, and sites for action research.

Planning students act as a bridge. They bring food issues into planning by introducing these topics in courses that they take and projects that they do. By working at the intersections of planning and other areas of environmental studies, they often raise new issues about planning and urban agriculture. As planning students, they apply planning theories and approaches to food. For instance, how do regional food systems relate to new regionalism debates? How do you plan for more equitable and

sustainable food systems? How do you target poverty reduction in rural development? How does communicative planning apply to community food security? Does GIS (geographic information systems) help in identifying sites for food production in the city?

In raising these questions, they highlight how food studies can benefit from a broader planning perspective, as well as how planning may be enriched by an emphasis on food and agriculture. As in other programs, our students struggle with the question of where food fits into the wider planning profession. If they focus on food and planning, where will they find employment? In Canadian cities, only Vancouver is known to have hired a planner specifically to work on food issues, although in other urban areas, such as the Region of Waterloo, planning and public health staff have worked together on strategic plans. In the short term, students have to become well-educated planners who can bring food planning into the planning conversation as food continues to be seen as a critical issue in urbanized areas.

## Contribution #2: On Collaboration in Teaching a Food Planning Course

Jerome Kaufman, Emeritus Professor, Department of Urban and Regional Planning, University of Wisconsin-Madison; and Marcia Caton Campbell, Milwaukee Program Director, Center for Resilient Cities

Our story is about the value of collaboration when stepping gingerly into virgin, unexplored territory in the planning field. In 1981 one of the authors of this piece, Jerry Kaufman, joined with Elizabeth Howe to teach the first-ever planning ethics class in a graduate planning program. Twenty years later, in 2001, Kaufman entered into collaboration with Marcia Caton Campbell to teach the first-ever class in a graduate planning program on community food planning. At the time each of these courses was offered, similarities were evident. Sparse research had been undertaken in the planning community to draw upon in teaching either subject. Little demand for, let alone interest, existed among planning students and planning faculty for either class to be offered. And both subjects were decidedly on the back burner of planning practitioners.

Yet, in both cases, these two quite different fields of inquiry gradually gained acceptance and legitimacy within the planning community. With planning ethics, which has been around much longer than community food planning, that acceptance is much more apparent. Planning ethics is now well integrated into the curricula of many planning schools, and recognized as an appropriate arena for theoretical inquiry as well as empirical research. And the professional planning community clearly recognizes the importance of ethics through its codes of ethics, which provide guidance for denoting both the aspirations and limits of planner behavior. In contrast, community food planning is still at the seedling stage, but recent signs show that the plant is growing at a healthy pace and becoming more firmly rooted in the planning community.

The circumstances that led to our co-teaching a semester-long community food-planning course are worth considering. In early 1997, Kaufman was asked to head up the Madison Food System Project (MFSP), part of the larger Wisconsin Food System Partnership, a five-year program funded by the W. K. Kellogg Foundation at the University of Wisconsin–Madison (UWM). With little knowledge of the food system, but having a good understanding of cities and regions, Kaufman accepted this challenge with a mix of trepidation and intrigue — trepidation, because he was an outsider to food system work and had a lot of learning to do, and intrigue, because the void in the literature of planning about food issues offered him an opportunity to cover new ground.

Soon after becoming MFSP director, Kaufman decided to combine his new interest in food issues with his role as a planning educator. Since it was his turn to teach the department's required planning workshop in the fall of 1997, he decided to jumpstart the learning process in the food arena by devoting the workshop to a community food assessment of the Madison-Dane County region. This was an ambitious undertaking, given the newness of the subject, but as a senior faculty member Kaufman had considerable range to choose a workshop topic of his liking. With the assistance of Kami Pothukuchi, a visiting assistant professor in the Department of Urban and Regional Planning (URPL) at that time, they undertook this new endeavor. They also joined forces to do some research on the connection between food and planning, and MFSP began to engage in some field projects in the Madison area. Pothukuchi left Madison in the spring of 1998 to

accept a full-time position in the planning program at Wayne State University.

Marcia Caton Campbell joined URPL in the fall of 1998 as an assistant professor. Hired primarily to teach conflict resolution, she also had a passing interest in food system issues. As a junior faculty member, however, she was initially discouraged by some of her new colleagues from joining Kaufman in what they viewed as a boondoggle. Delighted to discover Caton Campbell's interest, Kaufman soon drew her into the web of MFSP activities as its assistant director. She served as advisor to the MFSP student project assistants and collaborator with Kaufman on MFSP research and community-based service initiatives. They then began to discuss collaborating on a new course on community food planning. By then, the footing for such a course was more secure, not only among some planning students, but also with students in other campus departments, as interest in strengthening community and regional food systems began to rise. Moreover, Kaufman's colleagues in the planning department, puzzled at first by another of his wanderings into strange territory, began to think that maybe he was on to something.

*Planning for Community Food Systems* had its initial offering in the spring semester of 2001. Widely advertised across the UWM campus and structured as an introduction to community food planning for juniors, seniors, and graduate students, the course attracted students from diverse fields of study. The 17-student pool for this initial offering was quite broad: 6 were undergraduates and 11 were graduate students; 3 were URPL graduate students, while the rest came from at least 7 other campus departments; 5 of the 17 were self-described "hard-core foodies," while the remainder were drawn to the course out of curiosity. Kaufman and Caton Campbell were definitely teaching to the interested, but not yet to the converted.

The course combined lectures and discussion about the structure of the food system and food system issues with field trips to community food projects in the Madison area that ranged from a food co-op to community gardens and community-

supported agriculture farms. A reader of articles drawn from research literature, newspapers, and magazines as the course textbook was prepared. The growing food systems expertise around the Madison campus and the Madison community was tapped by inviting guest speakers to the class. Students were assessed through a midterm exam on basic food system concepts, reflective responses to field trips, and a final paper on a food issue of their choice. In addition, students engaged in service learning, contributing 10 hours of volunteer time to a food-related community organization over the course of the semester and writing reflectively upon that work. The course was sufficiently well received that the URPL faculty thought it should be offered again, although skepticism lingered about the relevance of the food system to urban and regional planning. At the end of the 2000-2001 academic year Kaufman retired, turning the directorship of MFSP and the teaching of the course over to Caton Campbell.

After reviewing, with Kaufman, the initial offering of *Planning for Community Food Systems*, Caton Campbell decided to teach the course again in the fall of 2003 solely at the graduate level to avoid content duplication with two undergraduate-level courses in the College of Agriculture and Life Sciences. The course remained structured around lecture, discussion, field trips to Madison area community food projects, and guest lectures by other faculty. This time, 11 of the 13 students in the class were master's students in planning. Seven of the 13 were "hard-core foodies," three of whom chose community food planning as a concentration within the URPL master's program. The seven indicated that they had come to UWM specifically to study food systems, although only a few had significant prior knowledge or experience in the area.

As before, the students wrote a midterm exam and reflective papers on class field trips. This time, however, the service learning component and individual final paper were replaced by a collaborative final project undertaken by the entire class: a white paper exploring ripeness for the formation of a local food policy council. The students ended the

course by presenting the white paper to an invited audience of approximately 40 city and county planners, local government officials, professionals working in food-related agencies and nonprofits, and interested students and faculty.

*Planning for Community Food Systems* was offered a third time during Caton Campbell's appointment at UW-Madison, during the fall of 2005. The course again attracted 13 graduate students, now almost all planning students, 6 of whom had come to URPL to specialize in community food planning and most of whom had some prior experience in food systems work. Caton Campbell was now not teaching to the newly converted, but to people with longstanding interest in the area. In addition, by 2005 the food systems literature had developed such that several excellent books could be used as course texts in addition to the standard reader. These recently published works and the students' level of sophistication raised the level of discourse about the food system and its relationship to planning to a much higher level. The course was structured similarly to the 2003 offering; however, this time, the class undertook an ambitious, participatory community food assessment for a Madison neighborhood.

What lessons did we glean from our collaboration? First and foremost, we discovered that a small, but steady, stream of students — roughly one-sixth of the incoming URPL students annually from 2003 on — were not only interested in studying community food planning, but were drawn to the UWM campus and to URPL in particular to satisfy their desire to merge interests in the food system and planning. During the 9-year period that community food planning flourished at URPL, master's and doctoral students structured their degree concentrations around food, took courses in many other departments around campus to add breadth and depth to their substantive interest, wrote working papers and theses that developed our understanding of the local food system, formed an official student group focused on food issues, and became local food activists in Madison and Dane County. Many of these students carried their food planning interests into their professional lives as planning

practitioners and consultants, and as faculty members in other planning programs around the United States (including Branden Born; see his contribution later in this paper).

As Caton Campbell prepared to leave URPL for planning practice at the end of the 2005-2006 academic year,<sup>17</sup> her students compiled a guidebook of pathways through UWM courses for future students interested in community food planning. These pathways represent multiple avenues through which students might engage in food planning work, by focusing on food and land use, food and the environment, food and community development, food and economic development, and the like.

The second lesson has to do with the reaction of others: our course was legitimated at the planning department level among its originally skeptical faculty, both by the students we succeeded in recruiting to our program and by the community food planning research and activism that we engaged in outside the classroom and in the community. Community food planning offered synergies in research and professional collaboration with colleagues from other departments, including rural sociology, agronomy, and family and consumer science. Our collaborations not only attracted significant numbers of students, but garnered substantial research dollars and support for students.

Third, the collaboration smoothed the waters for Caton Campbell to become engaged in food planning teaching, research, and community service activities. Having Kaufman, as a senior faculty member, "run interference" for her in the department helped other colleagues give her the green light to pursue her multiple interests in community food planning.

Finally, by joining forces, we had the opportunity to mentor students who expressed interest in food

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<sup>17</sup> Since then, another food system specialist, Alfonso Morales, has joined the URPL faculty, reviving the food stream in that department.



planning and advise them on career paths. Some wanted to work specifically in food planning. Most wanted to follow more traditional job paths in planning, but with a desire to expand their prospective colleagues' horizons about the benefits of supporting local and regional food systems. In addition, the relationship between Kaufman and

Caton Campbell, with Kaufman serving as a mentor to Caton Campbell at the beginning of her tenure at UWM, soon developed into an equal partnership. We both benefited from the rich give and take of our collaboration, with a productive synergy as the byproduct.

### **Contribution #3: Gaining Tenure Through Food Planning Scholarship**

Kami Pothukuchi, Associate Professor of Urban Planning, Wayne State University

Food offers an intuitive and immediate feel for the interdisciplinary and multi-systems nature of urban policy/planning issues (more so, I think, even than housing). Food is also a basic need, and today's crises of climate change, rising energy costs, homeland security concerns and food safety risks in global sources, and obesity and related health costs are already raising the importance of regional food systems and the indispensable role that planning can play in offering solutions. There is greater urgency for such recognition in other parts of the world, but I believe US planners are moving in this direction. The emerging local food movements, in offering leadership and practical support for planners (and the leadership offered by planners in this movement), are a key resource for food planning.

The course, *Cities and Food*, is a survey of social policy aspects of food, nutrition, and agriculture and their urban implications, especially (but not exclusively) in the North American context. There are some hands-on elements to course delivery, including participant observation by students of the workings of community-food sites such as a food pantry, grocery store, farm or community garden, farmers' market, CSA operation, etc. This is a course that is offered in the urban planning program to first-year graduate students and upper-class undergraduates. Because of initially insufficient enrollment by urban planning students, the course was actually taught only twice in the program over its first four years, despite being offered almost yearly. In that period, it saw more enrollments by students from outside the planning program. In Winter 2008, it was awarded a sustainability grant by CommunityEngagement@Wayne, a unit that promotes and facilitates community engagement by students, to develop the service-learning aspects of the course. Since 2008, it has been taught regularly as a combination

of lecture and a seminar series in which community-based "experts" discuss varying aspects of food systems. In 2011, 11 guest speakers visited on an almost weekly basis. The course now sees consistent enrollments from planning, nutrition and dietetics, political science, and other departments.

The "visiting faculty" experience teaching with Jerry Kaufman the graduate planning seminar on urban food systems at the University of Wisconsin-Madison both motivated and prepared me to offer the course. It underscored for me the urban relationships and impacts of food systems and the role that community and regional planning can play in delivering important goals related to food security, food access, and food system sustainability. As a graduate student, I had taken a course on "World Food Systems," which did inform my later work, but by itself it did not register as a potential focus of teaching in a planning department.

The usual means were used initially — fliers, student advising, and mass emails to students and faculty colleagues within and outside the department. Placing the course on the rolls was less challenge than obtaining sufficient enrolment. We face numerous structural barriers to successfully offering new courses, including the fact that our professional graduate program is aimed mostly at returning students, many of whom work fulltime. Courses are offered almost entirely on an evening/weekend schedule, which means fewer total time-slots (6 or 7) to offer a given number of courses, resulting in scheduling overlap of required and elective courses. Newer content with untested implications for professional planning practice is inherently hard to sell to our program's "target audience" and especially difficult to offer successfully given the scheduling structure. While this

impacted the Cities and Food course at first, it is no longer true due to more recent economic conditions. These days in the Detroit region, new graduates are finding more employment opportunities related to community food planning than in practically any other sector; many of our students have successfully taken on such positions or incorporated related elements in their jobs. A key challenge in the early years was that faculty colleagues in the department did not recommend this course to their advisees. A couple of interested students reported early in the course's life that they were discouraged from taking the course.

Because planning students have been in the minority, teaching the course has been a bit of a challenge as it was initially structured with more planning content. Now it is more a more general survey of issues/problems and solutions, even though a significant proportion of the papers is written by planners and/or incorporate planning approaches and perspectives. The hands-on element is useful regardless of the student's academic home. Recommendations in student projects completed in 2008 are being implemented in a new program called "SEED Wayne" — Sustainable Food Systems Education and Engagement in Detroit and Wayne State University. Hopefully, as students see their proposals considered for implementation, they will urge others to take the class. Since SEED Wayne started in 2008, its programs have attracted more students to the Cities and Food Class and its visibility — and recognitions it has earned — have led to more faculty acknowledgment of the importance of food issues and direction of students to the course.

There are usually one or two students (in a class of, say, 8 to 10 students) who are activist in their orientation and already involved with community organizations that deal with urban agriculture, food assistance, food rescue, or related issues. These students are distributed equally among planning and other students. For them, the course offers a broader, systems-oriented approach to their involvement and informs their activist approach, even if they are left somewhat confused about what planning is and how it can help.

Although my interests and involvement in local food activities are generally well known in the department, the course itself did not register on the radar screen of planning students or faculty members until the creation of SEED Wayne. This is partly because it was not consistently offered initially, was not part of the regular curriculum, and carried the "generic" number for new and experimental courses. My view is that, initially, faculty colleagues did not perceive this topic to be important for planners to learn about. The course does link to concepts I offer in other courses, such as urban design, community organizing, and planning theory. However, only those students who already have taken or intend to take the other courses benefit from the linkages.

In addition to difficulties with teaching about food systems, I also faced challenges preparing for tenure as someone working on an innovative topic for my research. Among the structural challenges I faced were:

1. Difficulties with obtaining outside funding for research on a new topic that does not squarely fall within traditional funding categories or funders' missions (none of my external grant proposals were funded prior to receiving tenure);
2. Isolation as a junior faculty in a department and university where colleagues in related interdisciplinary fields were hard to find (say, in public health or environmental studies);
3. The nature of an emerging field of practice in which research questions, contextual understanding, and identification of key actors necessitate active involvement in ongoing policy and grassroots efforts. I have found my involvement in the Community Food Security Coalition and in local organizations central to my contributions to planning scholarship but involvement also posed opportunity costs to time for research and writing. Plus, my inability to consistently teach a course on

food — an area of expertise for me —  
represented yet another opportunity cost.

Newer faculty may not face these challenges as  
intensely, as some of the conditions I reported  
have changed and other university contexts may be

friendlier to food planning faculty, given the topic's  
greater visibility in planning. I look forward to  
many more faculty members earning their tenure  
mainly through food planning scholarship, just as I  
did, as the field blossoms.

#### **Contribution #4: Food systems coursework, from one side of the podium to the other**

Branden Born, Associate Professor, Department of Urban Design and Planning, University of Washington

Planning for food systems was totally foreign to me in 1996 when I enrolled in my required urban planning graduate studio at the University of Wisconsin. It took that semester of applied research, plus a summer editing the final document, *Fertile Ground* (University of Wisconsin-Madison, 1997), combined with a trip to the first national conference of the Community Food Security Coalition, for me to see the connections to planning and opportunities for my professional contributions. I was fortunate to be influenced by two pioneers in planning and food systems, professors Jerry Kaufman and Kami Pothukuchi.

These experiences made clear to me the importance of incorporating food systems into planning curricula, and solidified my interest in offering such a class at my eventual home institution, the University of Washington (UW). I now teach a regular biannual class entitled *Urban Planning and the Food System*. In 2007 I completed a two-year class project in the UW's multidisciplinary Program on the Environment (PoE) in which we worked with the City of Seattle on a food system enhancement project, funded through the Henry Luce Foundation. Focused on Seattle, the PoE class conducted a citywide food system assessment (Garrett et al., 2006) in the first year, and two neighborhood assessments and a greenhouse gas emissions life-cycle assessment of the food system in the second. The continuing class, taught in the Department of Urban Design and Planning, is more general and examines each element of the food system from production to disposal, to develop understanding of how the food system came to function as it does, and of the role of planners and policymakers in its functioning.

Inspired initially by the success of Kaufman and Pothukuchi, I nevertheless approached teaching my class with reservation — would it be accepted

in my college and department? I was fortunate to find myself in an active food policy environment in Seattle. In my initial interview, the dean at the time mentioned that he had been approached by organizations focused on regional planning and sustainability and food and agriculture to seek the college's involvement. He thought my food system research, which I was relegating to a tangential focus, would be valuable to the college and, more broadly, to the region. Additionally, as a junior faculty member, I teach mostly larger service courses, which potentially gave me leverage when it came to proposing a new class that supported my interest area. It was only mildly challenged, as any new course would be, and was readily accepted by the faculty of my department.

As it turned out, the class was easy to fill; I wanted 12 students but allowed 15 to enroll, eventually losing three after the first week of course shopping. To advertise the class, I emailed the college and placed flyers about the course around the building, as is customary for our college. The second time it was offered, it filled simply by being listed in the university course catalog. Both offerings had students from outside the department and college.

The class contributes to the departmental curriculum in several ways. Primarily, it builds knowledge of food systems for future professionals, offering a marketable skill set and connections for future job opportunities. One student started working for the local affiliate of the national food bank, Feeding America, and another went on to start her own organic farm, marketing to Seattle residents. A third went to work for a community in eastern Washington (where large-scale wheat farming is common), where she found herself working frequently on food and agriculture topics. Three additional Ph.D. students have incorporated food

systems research into their studies and publication efforts.

The class also fills a demand niche. Students in our department are very interested in the linkages between planning and the food system: in a student survey to determine what students wanted for their required concentrations, the responses mentioned seven different concentrations (the department formally offers five), including three students who wanted to specialize in food systems planning. Recent articles on planning and food systems, in addition to an increasing amount of national and local press on food issues, have raised student awareness about the importance of understanding food system processes. The class has become something that the department can sell as a special offering, making the program more attractive in a competitive landscape of planning schools.

Generally, the class complements other classes in the department and competes little, so faculty passively support it. The fact that food systems issues continue to emerge in the literature has helped build its legitimacy, and as these issues are raised locally or within the department, I have become the go-to faculty member in the department. Students have also benefited beyond the pedagogy and long-term job opportunities through a variety of funded and non-funded research and teaching opportunities. I have been fortunate for the ongoing support of my departmental, college, and outside programs such as the Program on the Environment. Washington has proven to be fertile ground for this work thus far.

Finally, the class helps to prepare students to think about the emerging issues for society generally and planning specifically. As a field, planning is designed to consider the long-term perspective. As sustainability and large issues such as global climate change and global health come to the fore, planners need to be aware of the sea change and move beyond limited considerations of land use or design and begin applying those skills to a broader set of more global considerations. The class teaches students how to systematically address a new topic, and how to bring the characteristic skills and tools

of a field to bear on understanding it. This skill alone is valuable, regardless of the food and planning context.

Students in the class have been quite motivated and interested in food in a variety of ways. This is both beneficial and challenging: beneficial, because the level of knowledge on individual topics has been fairly high; challenging, because sometimes students have been less interested in topics outside their interest or specialty. For example, students interested in the development of the emergency or anti-hunger network in the US might be significantly less interested in learning about global trade regulations affecting food. This interest variability is, however, a problem in almost every class; and nontraditional or new topics may be particularly subject to it because students are even more likely to enter the class with limited or preconceived notions than they might in traditional coursework.

The class was run in a traditional seminar format, with student teams leading discussion on weekly assigned readings. There were field trips to visit food system locations throughout the region. The major assignment was a client-driven paper that assisted a local food system entity. This service learning approach is common to my other planning coursework, and as I have a broad view of planning form and function, I treat food systems planning as a natural part of the field.

My experience as a student helped me in developing the course and building legitimacy in my expertise in the subject area. I had some understanding of the transformation people can go through — from skeptical of food system relevance to very supportive of a planning role. The research we did for my graduate studio continues to function as a baseline of comparison and has helped me understand my professional research and service activities in ways I did not recognize at that time. I was lucky to enter a place that is very conscious of food system issues from quality to farmers' markets (especially as Seattle is home to the famous Pike Place Market) to urban growth patterns and the effects of land use regulations. My

interest and primary focus on land use and public decision making and the planning process has been nicely manifested in my food system studies, and the ripeness of the issue locally has allowed my university role to flourish as I have had strong

connections on the development of food policy in the city and county. My fifteen-year connection to food systems planning has certainly contributed to my success both in the academy and in application.

## **Contribution #5: Reflections on teaching food system planning and policy**

Kristina Bouris, Community Planner, City of Victoria, Victoria, British Columbia

The University of British Columbia's School of Community and Regional Planning (SCARP) offered the course Food System Planning and Policy in the spring of 2005. The course was proposed, developed and taught by Wendy Mendes and myself, working at that time as professional social planners with the city of Vancouver's newly established Food Policy staff team. In addition to practicing as planners, we were both completing our respective graduate studies on municipal food policy at the time. This dual role, of the planner straddling the realms of professional practice and academic theory, would become a guiding theme of the course.

The primary goal of the course was to articulate and critically analyze issues related to planning for local food systems. Where other graduate food system planning courses explore the valuable planning contributions from grassroots activity and civil society, this course was explicit in its focus on the role of local government planners. Expanding on the work of Pothukuchi and Kaufman (1999, 2000), we asked: what could local government planners "do" to facilitate local food systems? And, most significantly, what does it take to get the food system on the municipal agenda in the first place?

The course took an integrated view of the food system, drawing links from agricultural production through to the disposal of waste. It focused primarily on the urban environment, but also included a section on planning for rural agriculture. We showcased the work of fellow planners involved in food system activities. Among our guests were a policy planner, social planner, neighborhood planner, land-use planner, rural planner, and an environmental planner, collectively making the point that the food system cuts through the silos of traditional municipal planning practice.

The course was framed squarely within the context of sustainability, a unifying theme that forms the foundation of SCARP's curriculum (and the instructors' respective research). The sustainability framework provided the freedom to explore a broad range of sub-themes related to the food system, from urban poverty to green design, from globalization to land-use conflict. Although most students possessed a sophisticated understanding of both sustainability and the food system going into the course, the same could not be said for their understanding of municipal planning practice. Knowing this ahead of time, the course was designed to use the food system as a vehicle to teach students about the legislative, political and institutional context of local government in Canada, and the tools and techniques available to planners, regardless of the issue at hand. Several students remarked that this was the first course in which someone had actually explained zoning to them. We spent a lot of time on the basics, explaining the roles and responsibilities of local government planners. It is hard to argue that planners should "do" more for the food system if there is little understanding of what planners "do" in the first place.

We took a critical look at some of the underlying forces that shape food system planning. In particular, special attention was paid to the broader governance context within which planners work, including the role that politicians, community members, governing institutions, and other actors play in shaping planning agendas and processes. Specifically, the course examined the links between urban food systems and governance and policymaking at the local scale.

A combination of politics and pressure and timing determine whether the food system makes it into the planning agenda (Bouris, 2005); it could be said



that these same conditions determine whether a food system planning course makes it to the planning school agenda. The initial inspiration for the class grew out my collaboration with Wendy Mendes at the City of Vancouver, and our mutual interest in sharing the exciting research and initiatives with future planners. I proposed the course informally to SCARP's director in the fall of 2004, and he expressed tentative interest, pending budget decisions. The first class was held in May 2005. From my perspective, a number of conditions facilitated the course:

- A planning school with an explicit mission to “advance the transition to sustainability planning”, and a (now former) director and faculty who supported that mission. By framing this course with a sustainability lens, it was a relatively “easy sell”.
- A school with a culture of innovation and experimentation that has mainstreamed many non-traditional planning issues (e.g., Multimedia and Planning, Post-Sustainability Planning, Community Economic Development, Social Policy and Ecological Footprint Analysis).
- A school with a strong tradition of hiring local government and private sector planners as sessional instructors, thereby valuing the academic contributions of practitioners.
- Familiarity with the interests of students, faculty and the director (important in the marketing and design of the course), as I was a recent graduate of the planning program.
- A school director who had recently become knowledgeable about food system planning

and policy through supervising one of the instructors' research (mine).

- A group of students interested in sustainability and food issues who effectively lobbied the director for the course, right up until the final decision.
- Finally, on a practical level, a course that was proposed as an intensive, three-week, evening/weekend course during the summer session, a season when the school offered few other courses.

From my outside vantage point as a one-time sessional instructor,<sup>18</sup> it is difficult to determine which conditions are most important. The support of the director was central to many of these factors. It must be noted that the staging of this course faced a significant challenge due to uncertain funding. In fact, final confirmation came only in March, 10 weeks before the course was to start. In our desire to offer the class, we agreed to be paid less than the usual instructor's wage.

Looking back, I am honored to have worked with such a motivated group of students and fellow planners, and within a school that understands the food system's contributions to planning for sustainability. The course Food System Planning and Policy provided an opportunity to explore the delicate forces that create and shape an emerging planning issue. In response, planners need an understanding of complex, high-level, heady issues, as well as a firm grasp of the tools, techniques, processes and dynamics in their midst. Planners are already involved in the food system; given the right conditions, they are well positioned to do much more.

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<sup>18</sup> Authors' note: The course has been offered almost every year since by Wendy Mendes.

## **Contribution #6: Teaching Food as an Essential Element of a Sustainable Place**

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Since 2006, Tanya Denckla Cobb and I have taught a community food systems class, both as a substantive introduction to the theory and practice of community food planning and as a hands-on workshop class applying these ideas and theories to our own local region. The reflections in this piece concentrate on the first three years of offering this course.

The focus of the course also rotates through one of three foci: community food assessment, local food policy, and global food issues. In the first year, students focused on taking stock of the greater Charlottesville food system — and preparing a comprehensive assessment of this system. The second year had an explicit policy focus, with students emphasizing specific and promising policy topics — how to create a farm-to-school program, what would be needed to transform vacant land in the city into urban farms, in what ways could production of food take place at the university itself, and how and through what means could local farmers more effectively connect with local consumers (including, for instance, the proposal of a local food distribution center). Each project team was required to do some analysis, of course, but the explicit aim was to recommend policy that could bring these ideas to fruition, and to identify important obstacles that exist and that public policy and planning might help to overcome. The third year shifted the focus to the global scale, leading students to figure out where Charlottesville's food comes from, conducting nine different case studies to discern how to better balance global and local supplies. The students (and instructors) learned much, to be sure, and there are many good ideas about how our city and region can move in the direction of a more sustainable local food system.

But probably even more important, and somewhat more surprising, have been the beyond-class outcomes, the things that have been put in motion in one way or another: the catalytic effects of the courses. At the end of the first class, we arranged for the students to present their findings at city hall, and the turnout was impressive. At the end of the student presentations, the group in attendance collectively shrugged “what do we do now,” and on the spot a new local food organization was hatched. Called E.A.T. Local (Everyone at the Table), this group met for several years, and continues to function as an important virtual community and communication vehicle, helping to hatch a number of local food projects and initiatives. The classes, moreover, have resulted in local media coverage, newspaper stories, and have laid the groundwork for a highly successful state “food summit” convened in May 2007. Food courses and teaching such as this seem especially potent as community catalysts.

I have also learned that sustainable food and community food systems are wonderful avenues for teaching about community sustainability and sustainable place-building. Our planning department explicitly embraces sustainability as a value and goal, and as an important lens through which we view our entire curriculum. Food, as we know, provides entry to every aspect of community sustainability: unsustainable land use practices, energy consumption and fossil fuel dependence, public health and the obesity crisis, opulence and unsustainable consumption, among others. And it allows the chance to tangibly explore and advocate more sustainable lifestyles that need not be sacrificial, but rather are inherently richer, fuller, more healthy. Sufficiency and sustainability look pretty appealing when in the form of a rhubarb confit or local blueberry pie.

Reinvigorated local sustainable food systems, moreover, represent for me a potentially powerful form of community building, and a way to profoundly strengthen and revive our place commitments. Much of my own recent work has focused on creative ideas and practice for overcoming our increasing disconnect from people and landscapes, and for re-building a strong culture of place rootedness (e.g. Beatley, 2004). Rethinking food represents to me an important way of responding to our special *crisis of place*, as global pressures towards homogeneity and sameness undermine many of the unique and special qualities of actual places, as well as the personal relationships and networks that bind people together and to the landscapes they live in. Reviving more locally based sources of food, reconnecting local food producers with local consumers, looking for creative ways of allowing local residents to grow (together) at least some of their own food, and rediscovering the food heritages of a community or region, among other ideas, offer tremendous potential to re-build place and community and to reconnect people to landscapes and to each other. Teaching community food planning then, for me, becomes a way of teaching about place-building, understanding that to advance food security will at the same time deepen place commitments, and in these ways are natural extensions of my usual teaching and scholarship.

One of the most important lessons for me from these recent food forays is that the educational potential of food goes considerably beyond the specific topics and substantive teaching of a community food systems class. We discovered in our department that sustainable food issues have opened a window for all of our students, not just those self-described “foodies” who take our classes. The power of food as a way of connecting us to place and to making tangible sustainability issues and concerns was especially brought home to me in the fall of 2006 when our department embarked on an interesting and unusual experiment. During the previous summer, I had had the opportunity to meet and interview in Vancouver Alicia Smith, a talented author and, along with her partner, a passionate advocate for local food and

creator of the 100-mile diet (Smith & MacKinnon, 2007). I got a sense of how their experiment of living an entire year eating only foods grown within 100 miles of her home has helped transform her own city and community for her.

Later that same summer Alicia emailed me with a proposal. They were organizing a 100-mile Thanksgiving meal, and she wondered whether UVA would like to join the campaign. I thought it was a terrific approach to introducing sustainable and local food issues to the entire faculty and planning student body. After allaying some concerns about whether such a thing was feasible and even desirable (several students worried that this meant they could not utilize traditional spices and ingredients that they fondly associate with Thanksgiving), most of the angst seemed to center around the extra planning and thinking that might be required. Students could not just zip by the Giant or Harris Teeter and pick up a bag of chips and salsa. This was a terrific and helpful message in itself, and in the end the entire planning department embraced the concept with an incredible level of energy and positive enthusiasm. I incorporated the event and issues into my fall Sustainable Communities class, requiring each student to research a local food and to contribute a Thanksgiving recipe utilizing locally grown ingredients. I further incorporated a similar section on food in my much larger lecture Introduction to Community and Environmental Planning class (about 200 students) and challenged the students to think about how they might encourage their parents to organize a 100-mile Thanksgiving, or at least to be more conscious that year about the sourcing of food. The initial joke about our departmental dinner was that we were going to be drinking a lot of wine — Central Virginia is a burgeoning area of wineries and vineyards — and apples. But in the end the group presented a rich and diverse offering, from locally grown and stored potatoes and greens to turkeys from local farmer Joel Salatin’s Polyface Farm, now somewhat famous as a result of Michael Pollan’s book *The Omnivore’s Dilemma* (2006).

We all learned to think more carefully about seasonality as well, planning our meals around it. We also learned as a department what the present limitations are to eating locally, again something that our “foodies” were aware of but the broader group of students and faculty probably weren’t. We discovered a historic mill, Wade’s Mill, within our 100-mile radius, that sells flour and cornmeal from locally grown grains — a business that many of us continue to support. We also learned that finding local milk was very difficult (surprising to many, as local dairies had been at one time a ubiquitous connection between local landscapes and residents), though we fudged the 100-mile limit a bit to be able to use milk from a dairy in the Shenandoah Valley, just over the line.

We have now organized five such dinners, and the 100-mile Thanksgiving has become a regular and much-anticipated event in our department and school. Each year the students have added new activities and pre-dinner events, which have included canning workshops, visits to local farms, and, a few days before the event, a kind of pilgrimage to Polyface Farm to pick up the turkeys. The students and faculty take this Thanksgiving event and the challenge and opportunity to learn the issues behind it very seriously. Perhaps they are too serious at times: One year, Student Planners Association officials sent out an email that all dishes should be accompanied with a small placard or card indicating the estimated percentage of the ingredients that were derived from within 100 miles. These people I humorously dubbed the “local food police” and though the suggestion might have been a tad too regulatory and rigid for my taste, it was certainly interesting and educational to see the plates and dishes arrayed on tables with full geographical disclosure!

The challenge of sourcing and eating local food also opened up other new vistas and perspectives

on place and home. I had wondered about our Native American heritage, and wanted in some way to use our food and Thanksgiving as a temporal connection to the Monacans, the indigenous inhabitants of our central Virginia environment, who had stewarded this land for some 10,000 years before the European settlers arrived. They are given remarkably little acknowledgement or visibility in Charlottesville, which is proud of the three presidents who called the region home (including of course Thomas Jefferson, founder of the University of Virginia). My nod to this heritage came in the form of collecting from the grounds of the university white oak acorns (sweeter and with lower levels of tannic acid), and attempting to make acorn flour and then acorn bread. The bread yielded an unusual but delightful flavor, something I had never tasted before, made all the more special because of the connection with the history and biodiversity of my place on earth.

The lessons from this event have been many and impressive. Students and faculty alike learned much (and I certainly did, even as a 20-year resident) about our community and region, and we developed new personal connections with farmers and producers. It has been refreshing to see newly arrived graduate students join local CSAs and passionately support our increasingly vibrant farmers market, discovering their own roles as genuine members of a community, with real corresponding duties and commitments, and not just as temporary visitors (perhaps that is part of our problem: too many students never shed this ephemeral and superficial view of the places in which they reside). We all collectively learned, I think, to look at our home in a new way, and hopefully this newfound consciousness has helped to solidify our collective commitments to the landscape and to a community that ultimately sustains itself.

## **Contribution #7: Teaching Food in Rome**

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[formerly at Cornell University]

Visitors are drawn to Italy's landscapes, its historic legacy, and especially its food. Planning students and faculty in Cornell-in-Rome were no exception. Cornell's Rome Program serves undergraduate students in architecture, art, and planning, along with a small number from the humanities and social sciences. The core course for planners in Rome is a workshop in which students gather data on a small set of topics in three or four neighborhoods outside the historic center. The curriculum varies from year to year, but in general, the core course is complemented by course offerings on the Italian regions and on Italian politics and society and by travel to other parts of the country.

When we arrived in 2001 for that summer's planning workshop, we found market stalls piled high with fresh, local produce; myriad bakeries, butcher shops, pizzerias, and dairies; and superb trattorie scattered throughout Rome's historic center — outward signs of what seemed to be an outstanding food system. We were impressed by the unusual interdigitation of urban and rural landscapes: on the ancient Appian Way we found orchards and sheep, and in several Roman neighborhoods we found vegetable gardens and livestock. We also learned of Roman food concerns, from mad cow disease to the impacts of European agricultural policies on Italian foods and the closing of the wholesale produce market in Ostiense. When we studied Torre Spacata, a postwar neighborhood on the edge of Rome, we saw few signs of the robust food system that characterized the center. So, when the 2001 semester ended, I concluded that inequality of access to good quality food could be an important issue for planners and a fascinating entry point for the core workshop.

Five years later, I returned to the eternal city with a new group of students. By that time food planning had moved closer to the mainstream of planning concerns, the Slow Food movement had grown and gone global, new agricultural policies were redefining the agricultural roles of Italian regions, and Roman planners were paying increasing attention to the role of markets and piazzas in neighborhood revitalization and to the importance of preserving agricultural landscapes close to the city. In this context, I decided to make food a central theme of the workshop this time.

The structure of the 2006 workshop made it relatively easy to relate food access issues to other planning concerns. My collaborator Greg Smith and I divided the class into four working groups, each assigned to one of three neighborhoods: San Lorenzo, Valle Aurelia, and Prima Valle. The neighborhoods lie outside the Aurelian Wall and had been countryside until the early twentieth century. Each working group was comprised of four students: one focused on parks and open space, a second on housing, a third on transport, and the fourth on food. A fifth student, attached to the Prima Valle group, worked with immigrants. Smith, a Roman resident, played a key role putting us into contact with Roman officials working with markets and food, with local planners, and even with agricultural enterprises lying within the city's boundaries. In particular, meetings with city officials gave us fascinating insights into the structure and function of Rome's public markets. Smith and I shared a preference for qualitative methods, and we encouraged the "foodies" to hang out in local supermarkets, markets, and small retail shops. They interviewed shoppers in all three locations as well as market sellers. I also took them to some other market sites in Rome, notably the

Esquilino market, Rome's primary source of ethnic foods, recently moved to an indoor location.

Our work in Rome was complemented by trips to Sicily and Piedmont. We read about and visited Palermo's Vucceria, the fabulous fish market in Catania, and Torino's extensive covered and open market, which serves an ethnically diverse population. We also met with Slow Food organizers in Bra and members of the Piedmontese cattle "Presidio" on their farms.<sup>19</sup> In short, by the end of the course, we had met with food producers, retailers, consumers, food activists, and regulators. A missing link was the new Rome wholesale market, large portions of which were closed to visitors, but even without such a visit, we learned a great deal about the Roman and Italian systems, ending the semester less optimistic about the future than we might have been.

After studying San Lorenzo, Prima Valle and Valle Aurelia in some depth, we were less convinced that differential access to fresh food was the major question, although it remained an important one. The three neighborhoods were by and large working-class neighborhoods whose character was changing with rising housing prices and an influx of students and immigrants. All three were well served by supermarkets and retail shops. San Lorenzo and Primavalle had ample public markets as well. Only Valle Aurelia suffered in this regard: its weekly market was located on the urban edge, and it had only three fresh produce stalls.

Differences between neighborhoods were less apparent than the problems faced by particular subgroups within each neighborhood. Because the student groups were also asking about transportation, housing, and changing demographics, they became increasingly aware of the relationship between parking and food, and students were sensitized to the problems that the elderly faced in places served largely by

supermarkets or public markets on the edge of the neighborhoods. They also noted that public markets, open from 9 am to 2 pm, were of little use to working women. As outsiders living and cooking in Rome, students in the course became acutely aware of the key roles that immigrants played in food retailing and of the degree to which the food system met the needs of Rome's diverse ethnic groups — a topic that has received little attention from planners and sociologists.<sup>20</sup>

Our investigations raised concerns about the continuing viability of the Roman food system, with changes in the commodity chains that link producers to consumers. Of particular concern was the diminishing importance of the public market in the food system. Markets flourished in a society where many sellers had intimate connections to the countryside and where the wholesale market was close to retail markets. In this context, commodity chains were relatively short and potentially responsive to consumer demand. In 21<sup>st</sup> century Rome, these chains seem longer and more tenuous.

Our investigations coincided with the approval process for Rome's Master Plan. Students used planning documents and statistics provided by the city to learn more about agricultural land preservation policies. In this area, they were encouraged by positive statements about the ecological and landscape value of agriculture in the Roman countryside. In their neighborhood investigations of open space, they charted the presence of community gardens and livestock facilities on public land. Face-to-face encounters with animals in the city and discoveries of fava beans growing behind fences were some of the more delightful experiences of the field work, although we were surprised by the absence of a community garden movement and by the relatively underdeveloped state of organic product marketing.

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<sup>19</sup> "Presidio" literally means fortress. Slow Food has adopted this term to refer to the protection of particular cultivars, livestock races, and/or methods of production by producer groups and the validation of their methods.

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<sup>20</sup> A handful of studies do exist in this area. See, for instance, Lynch (2005) on Latino gardens in New York and the Northeast, or the work of Alfonso Morales (2007, 2009) on markets in Los Angeles.

At the end of the day, all students in the workshop — not just the “foodies” — had a greater appreciation of how food moves from producer to consumer, and what happens to it along the way. Todd drew on his work in the workshop for an honors thesis on changing patterns of food retailing in Rome. Ed, a big guy who shared Bill

Clinton’s former passion for fast food, came away vowing to start a fast-food outlet for Slow Food. On the whole, the class seemed to have gained a new consciousness about the centrality of food to national culture, social integration, and well-being. If nothing else, they are better cooks and smarter shoppers.

## References

- American Planning Association, Legislative and Policy Committee. (2006). *Food system planning white paper*. Washington, D.C.: APA Food System Planning Committee. Retrieved from <http://www.scribd.com/doc/34476977/Proposed-White-Paper-on-Food-System-Planning>
- American Planning Association. (2007). *Policy guide on community and regional food planning*. Washington, D.C.: APA. Retrieved from <http://www.planning.org/policyguides/pdf/food.pdf>
- American Planning Association. (2011). Planning for food access: A national scan and evaluation of local comprehensive plans. Washington, D.C.: APA Planning and Community Health Research Center. Retrieved from <http://www.planning.org/research/foodaccess/index.htm>
- Argenti, O. (2000). *Food for the cities: Food supply and distribution policies to reduce urban food security. A briefing guide for mayors, city executives and planners in developing countries and countries in transition*. Rome: Food and Agriculture Organization of the United Nations, Food into Cities Collection, DT/43-00E.
- Beatley, T. (2004). *Native to nowhere: Sustaining home and community in a global age*. Washington, D.C.: Island Press.
- Bouris, K. (2005). *Examining the barriers and opportunities to local food system planning in the Georgia Basin: Of planners, politics and the public*. (Unpublished master's thesis). University of British Columbia, School of Community and Regional Planning [https://circle.ubc.ca/bitstream/handle/2429/16248/ubc\\_2005-0012.pdf;jsessionid=012588E-DD04F33D20087E8AF3C560D0A?sequence=1](https://circle.ubc.ca/bitstream/handle/2429/16248/ubc_2005-0012.pdf;jsessionid=012588E-DD04F33D20087E8AF3C560D0A?sequence=1)
- Centre for Studies in Food Security, Ryerson University. (2008, 2–4 May). *The Role of Food and Agriculture in the Design and Planning of Buildings and Cities: A Symposium*. Ontario: Ryerson University. Retrieved from <http://www.ryerson.ca/foodsecurity/projects/urbandesign/presentations.html>
- Dahlberg, K. A. (1994). *Food policy councils: The experience of five cities and one county*. Presented at the Joint Meeting of the Agriculture, Food and Human Values Society and the Society for the Study of Food and Society, Tucson, Arizona.
- Dahlberg, K. A. (1999). Promoting sustainable local food systems in the United States. In M. Koc, R. MacRae, L. J. A. Mougeot, & J. Welsh, (Eds.), *For hunger-proof cities: Sustainable urban food systems*. Ottawa: International Development Research Centre.
- Dubbeling, M. (2001). A framework for facilitating planning and policy. *Urban Agriculture Magazine*, 5, Topic Paper 2. Retrieved from <http://www.ruaf.org/node/196>
- Food and Agriculture Organization of the United Nations. (1998). Feeding the cities. Excerpt from: *The state of food and agriculture*. Rome, IT: Food and Agriculture Organization of the United Nations. Food into Cities Collection DT/39-98E.
- Food and Agriculture Organization of the United Nations. (2000). Seminar addresses feeding Asia's cities. *FAO News Highlights*. November 23. Rome, IT: Food and Agriculture Organization of the United Nations. Retrieved from <http://www.fao.org/english/newsroom/highlights/2000/001102-e.htm>
- Foodplanning – urban planning and food systems. (n.d.). Listserv based at the University of Washington. <http://mailman1.u.washington.edu/mailman/listinfo/foodplanning>
- Garrett, S., Naas, J., Henze, T., Keithly, S., Radke-Sproull, S., & Watterson, C. (2006). *Sound food report: Enhancing Seattle's food system*. Seattle, Washington: University of Washington. Retrieved from [http://faculty.washington.edu/bborn/Sound\\_Food\\_Report2.pdf](http://faculty.washington.edu/bborn/Sound_Food_Report2.pdf)
- Gorgolewski, M., Komisar, J., & Nasr, J. (2011). *Carrot city: Creating places for urban agriculture*. New York, New York: Monacelli Press.
- Hammer, J. (2004). Community food systems and planning curricula. *Journal of Planning Education and Research*, 23(4), 424–434. <http://dx.doi.org/10.1177/0739456X04264907>
- Hodgson, K., Campbell, M. C., & Bailkey, M. (2011). *Urban agriculture: Growing healthy, sustainable places*. Planning Advisory Service (PAS) Series, No. 563. Chicago, Illinois: American Planning Association.
- International Development Research Centre (IDRC) and Urban Management Program for Latin America and the Caribbean (UMP). (2003). *Guidelines for municipal policymaking on urban agriculture*. Retrieved from [http://www.idrc.ca/en/cv-29688-201-1-DO\\_TOPIC.html](http://www.idrc.ca/en/cv-29688-201-1-DO_TOPIC.html)



- Kaufman, J., & Glosser, D. (2006a). The food system: A new addition to the planning field. *The Commissioner*, 1–2.
- Kaufman, J., & Glosser, D. (2006b). Food system planning: Why is it a planning issue? *Environmental Planning Newsletter*, 3–6.
- Komisar, J., Nasr, J., & Gorgolewski, M. (2009). Designing for food and agriculture: Recent explorations at Ryerson University. Special issue: Designing Edible Landscapes. Guest Ed. Bhatt, V. *Open House International*, 34(2), 61–70.
- Lang, T. (1999). Food policy for the 21st century: Can it be both radical and reasonable? In M. Koc, R. MacRae, J.A. Mougeot, J. Welsh. (Eds.) *For hunger-proof cities: Sustainable urban food systems*. Ottawa, Ontario: International Development Research Centre.
- Lawson, L.S. (2005). *City bountiful: A century of community gardening in America*. Berkeley and Los Angeles, California: University of California Press.
- Linder, M., & L.S. Zacharias. (1999). *Of cabbages and Kings County: Agriculture and the formation of modern Brooklyn*. Iowa City, Iowa: University of Iowa Press.
- Lynch, B. (2005). Nature, memory, and nation: New York's Latino gardens and casitas. In P. Barlett. (Ed.). *Urban place: Reconnecting with the natural world*. Cambridge, Massachusetts: MIT Press.
- Mendes, W. (2006). *Creating a "just and sustainable" food system in the city of Vancouver: The role of governance, partnerships and policymaking* (Unpublished doctoral thesis). Simon Fraser University. Department of Geography.
- Mendes, W. (2007). Negotiating a place for "sustainability" policies in municipal planning and governance: The role of scalar discourses and practices. *Space & Polity*, 11(1), 95–119.  
<http://dx.doi.org/10.1080/13562570701406683>
- Mendes, W. (2008). Implementing social and environmental policies in cities: The case of food policy in Vancouver, Canada. *International Journal of Urban and Regional Research*, 32(4), 942–967.  
<http://dx.doi.org/10.1111/j.1468-2427.2008.00814.x>
- Mendes, W., Balmer, K., Kaethler, T., & Rhoads, A. (2008). The role of urban agriculture in enhancing green communities: Experiences from Portland, Oregon and Vancouver, British Columbia. *Journal of the American Planning Association*, 74(4), 435–449.  
<http://dx.doi.org/10.1080/01944360802354923>
- Morales, A. (2009). A woman's place is on the street: Purposes and problems of Mexican American women entrepreneurs. In J. S. Butler, A. Morales, & D. L. Torres, (Eds.). *An American story: Mexican American entrepreneurs and wealth creation*. West Lafayette, Indiana: Purdue University Press.
- Morales, A. (2007). Conclusion: Law, deviance, and defining vendors and vending. In J. Cross, & A. Morales, (Eds.). *Street entrepreneurs: People, places, and politics in local and global perspective*. London: Routledge.
- Morgan, K., Marsden, T., & J. Murdoch, J. (2006). *Worlds of food: Place, power and provenance in the food chain*. Oxford Geographical and Environmental Studies Series. Oxford, UK: Oxford University Press.
- Morgan, K., & Sonnino, R. (2008). *The school food revolution: Public food and the challenge of sustainable development*. London: Earthscan.
- Mougeot, L. (1994). The rise of city farming: Research must catch up with reality. *ILEIA Newsletter*, 10(4), 4–5.
- Mougeot, L. (2000). Urban agriculture: Definition, presence, potentials and risks. In N. Bakker, M. Dubbeling, S. Gründel, U. Sabel-Koschella, & H. de Zeeuw. (Eds.) *Growing cities, growing food*. Feldafing, DE: Deutsche Stiftung für Entwicklung.
- Nasr, J., & Komisar J. (In press). Integration of food and agriculture into urban planning and design practices. In A. Viljoen & H. Wiskerke. (Eds.). *Sustainable food planning: Evolving theory and practice*. Wageningen, NL: Wageningen Academic Publishers.
- People's Food Policy Project. (2009). *Canadian food policy organisations*. Retrieved from <http://www.peoplesfoodpolicy.ca/canadian-food-policy-organisations>
- Planning for Agriculture & Food Network. (n.d).  
<http://groups.google.com/group/planning-for-agriculture-and-food-network-pafn?hl=en>
- Planning for Food. (2006). Post World Congress Seminar, June 21, 2006, Vancouver. Ministry of Agriculture and Lands, Government of British Columbia, Canada. Retrieved from  
[http://www.agf.gov.bc.ca/resmgmt/sf/plan\\_food/pl\\_food\\_0606.htm](http://www.agf.gov.bc.ca/resmgmt/sf/plan_food/pl_food_0606.htm)

- Pollan, M. (2006). *The omnivore's dilemma: A natural history of four meals*. New York, New York: Penguin.
- Pothukuchi, K., & Kaufman J. (1999). Placing the food system on the urban agenda: The role of municipal institutions in food systems planning. *Agriculture and Human Values*, 16(2), 213–244.  
<http://dx.doi.org/10.1023/A:1007558805953>
- Pothukuchi, K., & Kaufman J. (2000). The food system: A stranger to the planning field. *Journal of the American Planning Association*, 66(2), 112–124.  
<http://dx.doi.org/10.1080/01944360008976093>
- Progressive Planning. (2004). *Special Issue: Food and Planning. No. 158*. Retrieved from  
[http://www.plannersnetwork.org/publications/mag\\_2004\\_1\\_winter.html](http://www.plannersnetwork.org/publications/mag_2004_1_winter.html)
- Quon, S. (1999). *Planning for urban agriculture: A review of tools and strategies for urban planners*. Cities Feeding People Series, Report 28. Ottawa, Ontario: International Development Research Centre.
- Raja, S., Born, B., & Kozlowski-Russell, J. (2008). *A planner's guide to community and regional food planning: Transforming food environments, building healthy communities*. Planning Advisory Service (PAS) Series, No. 554. Chicago, Illinois: American Planning Association.
- Ratta, A., & Nasr, J. (1996). Urban agriculture and the African urban food supply system. *African Urban Quarterly*, 11(2/3), 154–162.
- Rocha, C. (2001). Urban food security policy: The case of Belo Horizonte, Brazil. *Journal for the Study of Food and Society*, 5(1), 36–47.  
<http://dx.doi.org/10.2752/152897901786732735>
- Schiff, R. (2007). *Food policy councils: An examination of organisational structure, process, and contribution to alternative movements* (Unpublished doctoral thesis). Murdoch University, Western Australia.
- Smit, J., Nasr, J., & Ratta, A. (2001). *Urban agriculture: Food, jobs and sustainable cities*. Unpublished 2<sup>nd</sup> edition. New York: United Nations Development Programme. Available at  
<http://www.jacsmit.com/book.html>
- Smith, A., & MacKinnon, J. B. (2007). *The 100-mile diet: A year of local eating*. Toronto, Ontario: Random House Canada.
- Stanhill, G. (1976). An urban agro-ecosystem: The example of nineteenth-century Paris. *Agro-Ecosystems*, 3, 269–284.  
[http://dx.doi.org/10.1016/0304-3746\(76\)90130-X](http://dx.doi.org/10.1016/0304-3746(76)90130-X)
- Steel, C. (2008). *Hungry city: How food shapes our lives*. London, UK: Chatto & Windus.
- University of Wisconsin–Madison. Department of Urban and Regional Planning. (1997). *Fertile ground: Planning for the Madison/Dane County food system*. Madison, Wisconsin: University of Wisconsin.
- Viljoen A., Bohn, K., & Howe, J. (Eds.) (2005). *CPULs – Continuous Productive Urban Landscapes: Designing urban agriculture for sustainable cities*. Oxford, UK & Burlington, Massachusetts: Architectural Press/Elsevier.
- Wakefield, S., Yeudall, F., Taron, C., Reynolds, J., & Skinner, A. (2007). Growing urban health: Community gardening in Southeast Toronto. *Health Promotion International*, 22(2), 92–101.  
<http://dx.doi.org/10.1093/heapro/dam001>
- Welsh, J., & MacRae, R. (1998). Food citizenship and community food security: Lessons from Toronto, Canada. *Canadian Journal of Development Studies*, 19, Special Issue: The quest for food security in the twenty-first century, 237–255.
- Wekerle, G. R. (2004). Food justice movements: Policy, planning, and networks. *Journal of Planning Education and Research*, 23(4), 378–386.  
<http://dx.doi.org/10.1177/0739456X04264886>

## The emerging role of a food system planner: Integrating food considerations into planning

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### Abstract

Recently, the planning profession in North America has begun to recognize the importance of integrating food considerations into planning. However, the field of food system planning is still in its infancy, and its proponents seek a more thorough understanding of the applied role of planning practitioners in this emerging field. This exploratory investigation included interviews with a small sample of self-identified “food system planners” in Canada and the United States whose work is quietly nurturing this emerging subfield in the planning profession. Based on the views of this sample of planners, we offer several considerations on how the professional planning establishment can enhance the ability of planners to contribute to the

development of holistic, sustainable, and equitable food systems. The lessons learned here may be applicable to other fields and disciplines where food system work is an emerging focus.

### Keywords

food security, food system education, food system planner, food system planning

### Introduction

Interest in food issues has increased in recent years in both the popular press (e.g., Kingsolver, 2007; Pollan, 2006, 2008, 2009; Schlosser, 2001) and planning circles (American Planning Association [APA], 2007; OPPI, 2009; Raja, Born, & Kozłowski Russel, 2008). Recent work by Kaufman (2009), Raja et al. (2008), and Pothukuchi and Kaufman (2000) outlines possible roles for planning in ensuring that communities have consistent and sustainable access to food.

This paper attempts to contribute to emerging discussions about the role of food in planning (and vice versa) by investigating the actual on-the-

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ground work carried out by a small sample of North American planners specializing in food system planning, as well as other planners working on food-related issues. Drawing on in-depth interviews with planners in Canada and the United States, the paper focuses on identifying the need for food systems expertise within planning, and the skills required for food system planning. The paper concludes with strategies that the planning profession and academe should consider in the context of preparing planners for the growing opportunities in the food system arena. While the paper focuses on experiences within the planning profession, other practitioners who work on food system issues may find some lessons in the experiences of these “food pioneers,” and might consider exploring the relevance of our findings for other areas of practice.

## Literature Review

### *Background: Our Food System*

Planning for food security in cities actually has a long history: As architect and author Carolyn Steel suggests, “without farmers and farming, cities would not exist” (Steel, 2008, p. 7). For millennia, cities evolved around and in accordance with food distribution routes (Steel, 2008). Prior to the industrialized age, growing food was part of city life, and during particular periods (e.g., the World War II years), urban agriculture has been promoted.

Depending on the prevailing wisdom of the day, food cultivation in and for cities has been either encouraged or discouraged by urban planners. Indeed, modern planning approaches have often discouraged urban food production (Nasr, MacRae, & Kuhns, 2010). Access to urban and peri-urban land for agriculture has been lost as a result of agricultural restructuring and urban development pressures (Magdoff, Buttel, & Foster, 2000; Redwood, 2009). Moreover, planners often place grocery stores under the more general rubric of “commercial retail development,” leaving this critical land use open to market forces rather than treating as it as an important piece of civic infrastructure that deserves concentrated attention. As a result, in most North American cities today, many

new grocery stores, along with big box outlets, are built more than 546 yards (500 meters) away from residential land, which makes them accessible only by cars (Larsen & Gilliland, 2008). The phenomenon of food deserts — areas where a community lacks access to healthful and nutritious food — in cities around North America is connected to planning decisions (Larsen & Gilliland, 2008).

In addition, modern industrial agriculture, which has been the dominant food regime led by the global North (Friedmann, 2005), has focused on producing commodity crops for international trade rather than food production for local consumption (Magdoff et al., 2000). Urban consumers have become distanced from the sources of their food, both geographically and psychologically (Wittman, 2009). Much of the food we eat travels through long, energy-intensive commodity chains before arriving, anonymous, on the shelves of local supermarkets (Watts & Goodman, 1997). The abundance and diversity of food available in most grocery stores could lead observers to believe that access to food in urban centers is not a problem. However, our food security is threatened by an unsustainable food supply system (e.g., Bunce & Maurer, 2005; Forkes, 2007; Morison, Baker, Mullineaux, & Davies, 2008; Xuereb, 2005) that critics suggest pays more attention to profitability than it does to equity, the environment, and health (Lang & Heasman, 2004; Nestle, 2002; Power, 1999). Chronic crises in farming and fisheries continue to threaten the livelihoods of food producers (Qualman & Wiebe, 2002), while the high cost of production is leading many to abandon farming altogether.

It has been estimated by retailers that there are only about three days worth of fresh food in major cities at any given time, leaving them vulnerable to emergencies that could close supply lines, such as disease epidemics, natural disasters, trade embargos, etc. (Campsie, 2008). A broad base of local production could help fill food supply gaps in times of disruption and scarcity (Trinh et al., 2003). In addition, access to food is not that straightforward for the increasing number of Canadians and Americans living in poverty who cannot afford

food after other costs of living have been paid (Food Banks Canada, 2010; U.S. Census Bureau, 2010). In New York City alone, 40% of residents (more than 3.3 million New Yorkers) experienced difficulty affording food in 2009, an increase of 60% since 2003 (Food Bank for New York City, 2009). A food system that better meets the needs of all residents is required to ensure the entire population can access food with dignity.

A healthy and sustainable food system, according to the American Public Health Association, is one that:

provides healthy food to meet current food needs while maintaining healthy ecosystems that can also provide food for generations to come with minimal negative impact to the environment. A sustainable food system also encourages local production and distribution infrastructures and makes nutritious food available, accessible, and affordable to all. Further, it is humane and just, protecting farmers and other workers, consumers, and communities. (APHA, 2007, para. 4)

Moving toward a more sustainable food system will require addressing the problems in the food system identified above in a comprehensive and systematic way.

### *Planning the Food System*

There is a significant opportunity for planners to contribute to more sustainable food systems and healthier communities. Planning as an occupation aims to improve the welfare and health of people and communities through the logical arrangement of land, resources and facilities (CIP, 2009; American Planning Association [APA], 2009a). Moreover, Hodgson (2009) argues that it is impossible to have healthy communities without healthy food systems. Pothukuchi and Kaufmann (2000) have defined the food system as the “chain of activities connecting food production, processing, distribution, consumption, and waste management, as well as all of the associated regulatory institutions and activities” (p. 113). It is thus not merely a unidirectional “farm-to-fork”

system, but rather a circular system that includes the reintegration of waste into food production.

It is easy to see areas of interface between traditional subfields of planning (e.g., rural, urban, land-use, transportation, environmental, economic development, etc.) and food systems. However, none of these existing subfields fully incorporates food system planning; for example, even agricultural land use planners generally fall under the umbrella of rural planning, which focuses almost exclusively on rural areas and does not address the whole food system per se (see for example the Ontario Ministry of Agriculture, Food and Rural Affairs’ roles for agricultural land use planning staff (OMAFRA, 2010)).

Kaufman (2009) suggests that food issues of particular relevance to planning include:

- food deserts, where access to affordable quality food is difficult;
- food traveling long distances, resulting in excessive use of fossil fuel energy; and
- environmental and social costs of food production, including processing, storage, distribution and waste.

In addition, issues related to preserving agricultural land and sustaining food-related livelihoods in both urban and rural settings are of importance to planners (Churchyard, 2010).

Planners increasingly are recognizing the importance of food systems in their practice, and more specifically for the communities they serve. In 2005, a session on food system planning was held for the first time in the APA’s history. An APA white paper on the importance of planning’s role in the food system was the impetus for the APA’s *Policy Guide on Community and Regional Food Planning* (APA, 2007), which recognizes that the food system has implications for health, the economy, ecological systems, social equity, and culture. In a recent survey conducted by Raja et al. (2008), 90% of the 192 APA members who responded felt that

farmland preservation should be a significant or top priority for the planning profession. In Canada, the Ontario Professional Planners Institute (OPPI) conducted a survey wherein close to 50% of members surveyed felt that planners should have a significant involvement in community and regional food system issues, while 10% felt that it should be a top priority (Caldwell, 2010). In October 2010, this same organization organized a symposium solely devoted to food planning entitled “Healthy Communities and Planning for Food” (OPPI, 2010).

The increasing interest in food among planners is slowly making its way into the planning curriculum as well. According to Hammer (2004), 60% of the 68 U.S. programs accredited by the Association of Collegiate Schools of Planning did not offer any food systems–related courses in 2004. However, Chrisinger (2009) reported an increase in demand for food-related courses in planning schools, and noted that students were also becoming involved in more food-related work such as farm apprenticeships and school gardens.

With the growing awareness of the importance of food considerations in shaping healthier communities, there are increasing opportunities for planners to be involved in food system planning. There is growing momentum in food advocacy and a stronger awareness of food-related issues in the public sector. For example, there has been a strong demand for backyard chickens in cities across North America, and city officials are taking note of this controversial planning and public health issue (MacDonald, 2009; Peat, 2010). Meanwhile, in the United States, many cities have started to consider producing regional food planning documents or conducting studies for food planning (see, for example, *A Guide to Local Food System Planning for Scott County, Minnesota* (Aitchison, 2009), or *Fertile Ground: Food Systems Planning for Madison/Dane County* (University of Wisconsin-Madison Department of Urban and Regional Planning, 1997)). To date, however, we know of no prior study (quantitative or qualitative) in the planning literature that has included in-depth interviews with planners currently active in food systems work. In this exploratory

study, we have documented some of the barriers that planners face when conducting work related to food system planning, and identified a few key strategies that will help the planning community value this increasingly important work.

## Methods

Informal, semistructured interviews were conducted with 12 planners from Canada and the United States. A call for participation in this study was conducted through two of the main food and planning listservs, *Planning for Agriculture and Food Network* (PAFN) in Canada, and *Food and Planning* for the United States.<sup>1</sup> These listservs were seen as likely sources to contact planners interested in food. As the universe of planners who were self-described “food system planners” was small and no list of planners actively engaged in food systems was known to exist, we used a snowball sampling approach. Of the 12 planners interviewed, 11 identified themselves very broadly as “food system planners” with various degrees of involvement with food and agriculture-related matters. It is important to note that only two of the 12 planners had the actual job title of “food system planner.” Some of the planners interviewed have been pioneers in the field of food systems planning, while others had just started to include food considerations in their day-to-day work.

We used a semistructured interview guide with a uniform set of core questions (see table 1). In addition to this core interview structure, interviewees were given ample freedom to explore ideas and share opinions on various issues. All interviews were taped and transcribed, and interview transcripts were reviewed for key themes based on the goals of the research. Wherever possible, verbatim quotes are used to illuminate key themes.

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<sup>1</sup> These listservs can be accessed by following the instructions available at [http://www.agf.gov.bc.ca/resgmt/sf/plan\\_food/network.pdf](http://www.agf.gov.bc.ca/resgmt/sf/plan_food/network.pdf) (for the PAFN listserv) and <http://mailman2.u.washington.edu/mailman/listinfo/foodplanning> (for the Food and Planning listserv).

**Table 1. Interview Core Questions**

1. What is your title and how did your role evolve to include food systems considerations (or has it always been a part of your role)?
2. What are specific land use and food-related issues you have dealt with?
3. In your opinion, what are the benefits or drawbacks (if any) of specifically categorizing oneself as a food system planner?
4. What are the challenges (if any) that you have encountered in planning for a sustainable food system?
5. What is your perspective on whether or not there are gaps in the planning field when it comes to understanding the importance of food and agriculture considerations?
6. What do you see as the role of planners in food systems work?
7. What are specific skills that you have as a planner that you feel are beneficial in the work toward a sustainable food system?
8. How can we improve opportunities to integrate food considerations in municipal or regional planning?

## Results

### *Background Characteristics of the Interviewees*

Table 2 summarizes the backgrounds of the interviewees. The interviewees included six Canadians and six Americans. This was purely coincidental. Since we believe there are not enough cases to make any significant generalizations, no distinction other than their nationality is made in this analysis. Twice as many females than males participated in

**Table 2. Summary of Interviewee Backgrounds (N=12)**

<b>Educational Background</b>	
Degree in planning	10
Degree in field other than planning	2
<b>Gender</b>	
Female	8
Male	4
<b>Sector of Occupation</b>	
Public	5
Private	3
Academic	2
Nonprofit	2
<b>Country</b>	
Canada	6
United States	6

the study. The interviewees were distributed unevenly across four occupational sectors, including private consulting firms, public planning departments, academic programs, and nonprofit organizations.

All but two of the planners interviewed have degrees in planning. However, the two participants without planning degrees have planning experience working for a private firm and a municipal planning department. All but one of the planners identified with the broad category of food system planner, as they were working or have worked on food-related matters. One planner did not consider herself a food system planner, but we included her in the study because she had seen an increasing demand for knowledge of the food system.

### *Food Systems as a Planning Priority*

All the planners interviewed believed that food system planning is of increasing interest, but that it is not at the top of the list for most planning priorities due to structural constraints within planning departments. Some planners noted that “food system planning” was not well understood or institutionalized. The role of a food system planner could be characterized at the moment by abject “vagueness.” As one planner put it,

I definitely call myself a food system planner, but it is kind of a made-up term, because it

doesn't really exist out there as part of the professional world yet.

Another planner who does not actually have a formal planning title said,

My title is vague. We have a food policy program and I manage that...so I consider myself a food system planner by default.

Meanwhile, another planner was slightly more optimistic about people understanding her title and role as a food system planner:

I do think the occupation is becoming recognized, but in terms of synchronizing the language, I think that is the challenging part.

But the vagaries of titles are just a symptom of much larger structural barriers in defining and expanding food system planning. One Canadian planner who works in a private firm lamented the bureaucracy hindering support for food planning:

The limits aren't the idea, the limits aren't the technology, and the limits aren't how creative we can be....The limits are things like needing to meet density targets, dealing with "scarce land resources."...We talk a lot about developing complete communities that can sustain themselves, we use the word sustainable in every sentence — it's totally lost its meaning as far as I'm concerned.

The quote above illustrates the resistance by municipalities and city bureaucracies with respect to supporting innovative programs and policies related to food. Put simply, planning for food is not a priority in most municipalities in North America. However, the interviewees did note that some food issues are coming onto the radar screens of planners — for example, one interviewee noted that farmland preservation is an increasingly important issue due to concerns over sprawl and rapid urban growth. However, other food issues remain off the radar:

Truthfully, if we look at it fairly generally across the country, there are many priorities. Strangely enough, farmland preservation might be ranked more highly than what we think, but food would not necessarily be that highly ranked, so in some ways, we are dealing with the traditional sets of issues of which the protection of farmland is one but the protection of farmers and farming livelihoods is not so highly rated.

This quote reminds us that attending to one aspect of food planning (e.g., farmland preservation) without addressing others (e.g., adequate farm incomes, availability of local food distribution channels) in a holistic manner can fail to solve problems. For example, the same zoning laws and policies that protect or preserve farmland in some cases may restrict farmers' ability to increase their incomes by prohibiting farmers from selling their own value-added products on their farms. This restricts farmers' livelihoods and could compromise their ability to continue farming.

Meanwhile, as another interviewee noted, the general public seems to be moving ahead of the planning profession in relation to food issues:

It's actually very interesting how knowledgeable the public is about food planning and how obvious the lack of food system planners within the city, and within the typical consulting firm, is.

According to this respondent, the planning profession clearly has some catching up to do to be able to address adequately these issues of public concern.

#### *Topical and Technical Expertise Required To Be a Food System Planner*

We discovered in our interviews that planners' experience with farms and agricultural systems were seen as important, especially in terms of perceived credibility. A planner with a background in agriculture stressed the importance of a practical knowledge of food growing:



I think it is very important that planners have an understanding of agriculture. It is difficult to advocate for change if you don't truly understand the existing system....We want to make sure that we can speak with conviction and we want to speak from a perspective that is not naïve....We need to have a handle on our role but also a good handle of what agriculture is all about, the challenges farmers face, the dilemmas and difficulties of making a living, while at the same time speaking and looking forward to a new system approach.

Planners specializing in food often interact with farmers. In this planner's case, her knowledge of growing food enabled her to communicate with stakeholders:

I had to facilitate a meeting with farmers and they looked at me like "who is this city woman

and what does she know about farming." And it is true, I am learning about farming and I am not a farmer...so on one hand I know quite a bit about farming, but on the other hand I'm not a farmer; but at least the knowledge that I had gave me the confidence to navigate through that experience.

The interviewees emphasized the need for both technical expertise as well as so-called "soft skills" in food system planning activities. Table 3 summarizes the various examples of skills needed in food planning that emerged in the interviews. Interviewees identified four broad categories of skills that would be beneficial in food systems planning. While specific, technical knowledge in both agriculture and planning were seen as essential, other, more transferrable skills — such as approaching problems holistically, having interpersonal communication and facilitation skills, and research

**Table 3. Skills and Expertise Needed for Competent Food System Planning**

Skill Set or Area of Expertise	Examples of Planning Activities Requiring These Skills
<b>Technical knowledge and skills:</b> <ul style="list-style-type: none"> <li>▪ Data collection and statistical analysis and presentation</li> <li>▪ Mapping and GIS</li> <li>▪ Knowledge of agriculture</li> <li>▪ Knowledge of planning (regulations, best practices, etc.)</li> <li>▪ Knowledge of the food system, including but not limited to: food processing industry, wholesale and retail distribution, community gardening, community centers, composting</li> </ul>	<ul style="list-style-type: none"> <li>▪ Identifying and amending planning and land use regulations that hinder local food systems and/or food access (e.g., protecting prime agricultural land, reducing food deserts, and facilitating development of community gardens and farmers' markets)</li> <li>▪ Identifying suitable land for urban agriculture</li> <li>▪ Conducting Community Food Assessments</li> <li>▪ Reviewing land use and development proposals and applications</li> <li>▪ Creating incentives or plans that can be used to encourage the development of a particular land use supportive of food growing</li> </ul>
<b>Oral communications:</b> <ul style="list-style-type: none"> <li>▪ Public speaking</li> <li>▪ Group or meeting facilitation</li> <li>▪ Community engagement</li> <li>▪ Negotiation</li> <li>▪ Conflict resolution</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public engagement activities with farmers, urban communities, food producers and retailers, land developers, other policy-makers, etc.</li> <li>▪ Work on multistakeholder committees (e.g., Food Policy Councils)</li> <li>▪ Collaborations with other departments (public health, economic development, etc.)</li> </ul>
<b>"Big picture" holistic systems approach</b> (recognizing interconnectivity)	<ul style="list-style-type: none"> <li>▪ Planning to reduce obesity</li> <li>▪ Planning for agritourism</li> <li>▪ Food-related local economic development</li> <li>▪ Risk management and security planning</li> </ul>
<b>Research and writing skills</b>	<ul style="list-style-type: none"> <li>▪ Policy research (e.g., environmental scans, identifying best practices)</li> <li>▪ Policy development (e.g., drafting bylaws and policy statements on such diverse issues as community gardens, farmers' markets, agricultural land use, animal control, etc.; developing food charters)</li> </ul>

writing — were also seen as important to successful food planning.

Some of the participants also suggested that the food system planner needs to not only be a technical expert, but also, given the appropriate context, a teacher, advocate, liaison, capacity-builder, and facilitator. Emphasizing this point, one interviewee noted that a key component of a food system planner's role is "to bring other planners up to speed on what planning for food looks like so that they can bring it to their practice."

### *Food Systems in Planning Education*

All the planners interviewed felt that general planning education should include a greater emphasis on food systems. Interestingly, only one out of the 10 planners with a formal planning education was able to take a food-related course during their university studies. Food system planning is generally not a formal part of the curriculum for most academic planning programs, although this is beginning to change. It is no wonder that, while the planners interviewed possessed many of the skills required to successfully address food system activities, they have adapted by taking a "learn as you go" approach. As one planner put it,

I come from an agriculture background. I have done a little bit of planning in my masters degree...but I am not a member of the Canadian Planning Institute. So, I've always been interested in agriculture and food systems, but I haven't had the opportunity to do any work directly in food system planning before, so I guess I'm learning by doing.

The issue of how best to train planners in food systems emerged as an interesting question, with two competing ideas: *specialization* (in which one's training would largely focus on food systems) and *integration* (having food systems integrated into the general planning education). The interviewees presented strengths and drawbacks of both approaches. For example, a regional planner who commented on the lack of food systems planning expertise in his department suggested that a specialization would be useful:

In our department, we have quite a few planners and a lot of our planners specialize in different things, housing, transportation, transit, agriculture, but we don't have somebody who is specialized as a food system planner and in a department of that size it might be useful to have someone like that specifically devoted to that kind of work.

Echoing this view, a planner in a private firm suggested:

In terms of being on the leading edge, yes, we do have a real opportunity...but you need a specialist on the team to push the idea, and I think what you would find is that there aren't that many people who are able to work as food system planners.

The opposing view was expressed by another planner who is concerned that making food system planning a specialization could create more "silos" in the profession:

I am certainly of the impression that food systems planning needs to be more integrated into other disciplines. It can't be an isolated expertise because the way you move forward is actually embedding food planning into other activities.

This sentiment was shared by a planner who is also an academic, who said,

It is important to have courses, tasks, interests and whatnot that focus solely on food so that you can really go deeply into those issues, but it is equally important for planners to understand that the food system is a system...Planners need to understand this system as one of the systems that they are responsible for and that they need to be cognizant of and conversant in it just like housing, economic development, transportation or anything else.

With respect to the issue of specialization versus integration, one planner suggests is not an "either or" position, but a "both and" position, maintain-

ing that it is possible to produce specialists in food system planning while at the same time integrating food considerations into other planning subfields. But the reverse is also true: it should be possible to be a planning generalist, or a specialist in some other recognized planning subfield such as transportation, housing, land use, or economic development, and still have some training in food systems.

### **Emerging Themes and Next Steps**

This was an exploratory study, and as such it is neither appropriate to make sweeping generalizations about planners or the planning profession, nor to offer very specific recommendations. However, we do believe this study highlighted some critical emerging themes as the professional planning community begins to recognize the role of food system planning, and we offer the following three considerations:

#### *1. Food system planners desire and deserve greater recognition from the professional planning establishment.*

First and foremost, the time seems to have come for food system planning to be recognized as a legitimate planning subfield. As we described in our introduction, the American Planning Association has taken dramatic steps in the last five years to elevate the status of food systems planning in the profession. As of this writing, the APA has received funding from the Robert Wood Johnson Foundation for research on reducing food access disparities among children, adolescents and adults (APA, 2009b). Furthermore, about 100 members of the APA have established a Food Interest Group that provides some resources and initiatives for planners. We agree with planners who are calling for the APA to expedite creating a Food Systems Planning Division, which has a higher level of recognition in the association and can provide support for food system planners and the growing field of food systems planning on a much larger scale. The creation of an APA division would provide tools and resources such as newsletters and special publications, as well as offer the ability to organize conferences and workshops on special topics of interest to the division. As a division, these planners would be in a position to pro-

vide critical social networking opportunities and take leadership in the development of the food systems planning subfield. The Canadian Institute of Planners should also take a proactive approach similar to the APA and acknowledge the food system as part of the planner's responsibility in its mandate.

#### *2. Food system planners and related professionals should consider establishing a more formal community of practice that includes professional development training in food systems planning.*

In this time of fiscal austerity, many communities may surmise that it is not practical to hire a food system planner or specialist. Communities that do not choose to hire a planner with a food system specialty might consider sending one of their current planners to a professional development program on food systems. We therefore recommend that a professional development certificate in food systems planning program be established. This could include amassing credits by participating in distance learning, conference workshops, and/or special training opportunities at national conferences, as well as traditional classroom opportunities. However professional development moves forward, there is little doubt that many planners will be interested in "getting up to speed" on food system planning.

#### *3. Consider expanding traditional urban and regional planning degree programs.*

Just as professional organizations are warming up to food system planning as a legitimate planning endeavor, traditional planning education is also showing signs of doing the same (Chrisinger, 2009). We recommend that this trend continue so that planners are able to develop some level of familiarity with food issues during their program of study. This can include greater engagement with food issues through "core" or required courses, as well as standalone electives on food planning. While this paper focuses on the planning discipline, similar trends are likely occurring in other fields as well (e.g., geography, architecture, rural sociology, and public health). These academic fields will address food system issues through their specific disciplinary focus, however, and so should not be

seen as adequately substituting for food systems training within planning programs. Corporations, foundations, and national agencies may be interested in supporting the development of the field of food systems planning, and we suggest that appropriate sources of funding be secured to support food research and curriculum development in planning programs.


In addition to the recommendations above, there is considerable room to enhance our understanding of food systems planning through further research. This exploratory investigation only scratched the surface. We believe there is considerably more to learn from planners about the state of food system planning, and we recommend that a larger quantitative study be conducted to gather details about specific tools, strategies, and approaches that planners are currently employing in their food systems work, as well as gaps they observe in training and education. Case studies in food system planning would follow naturally from this quantitative study and would help us to develop best practices. Other research could include an exhaustive inventory of current planning programs that offer food systems planning courses, as well as those offered by the allied fields of geography, sociology, community development, economics, and political science. Curriculum and syllabi could be gathered and made available to faculty and graduate teaching assistants to support work being done in this emerging field.

### **Conclusion**

The small number of interviewees in the current study reflects the relatively small number of planners engaged in substantial food systems work. The interviewees generally continue to see validation and recognition for the work they are doing in food systems planning. They have become de facto food system planners or specialists because they agreed to take on the work when it was presented to them. With little support from their employers and their professional organizations, these intrepid pioneers are beginning to cultivate the nascent field of food systems planning. As communities continue to factor food production, processing, distribution, consumption, and waste recycling into the mainstream planning calculus, there will be grow-

ing demand for planners with food system knowledge and expertise.

Planners have particular skill sets (e.g., the technical knowledge to deal with land use and zoning, spatial analysis and mapping, statistical analysis, and demographic projections) that can complement the skills and activities of other professionals who are currently working hard to address particular food systems issues (e.g., public health professionals, community development practitioners, and architects). Planners are already involved, in some way, with one or several components of the food system; for example, zoning bylaws and land use policies affect every component of the food system. With the rise of food-related activities ranging from urban agriculture initiatives, regional food policy, farmland preservation plans, to increased concerns in the community over the impact of the built environment on health (food deserts, for example), engaging planners who have a strong understanding and practical experience in food systems is needed to navigate the complexities of the food system and to deliver successful projects.

There are a plethora of social, economic, and environmental benefits embedded in planning for food, and ensuring healthy food systems is vital to both urban and rural communities. Applying professional planning expertise to the creation of food systems that are ecologically sustainable and more equitable is a worthwhile endeavor. The interviews with planners clearly demonstrate they have a critical role to play in creating sustainable food systems. They offer a wide array of specific technical knowledge, as well as leadership skills that assist in providing effective communication with neighborhoods, communities, cities, and regions that wish to plan for a more sustainable food future. In this paper we have identified some of the key issues and concerns of planners who are actively engaged in food system-related planning activities. While the focus here was on the planning profession, similar transitions are likely underway in other fields, and we hope that this paper will raise awareness of the importance of a holistic approach to planning food systems, both within and outside the planning profession. 

## References

- Aitchison, K. (2009). *A guide to local food system planning for Scott County*. Minnesota. Minneapolis: University of Minnesota.
- American Planning Association (APA). (2007). *Policy guide on community and regional food planning*. Retrieved from <http://www.planning.org/policy/guides/adopted/food.htm>
- American Planning Association (APA). (2009a). *What do planners do?* Retrieved from <http://www.planning.org/aboutplanning/whatisplanning.htm#2>
- American Planning Association (APA). (2009b). *Access to healthy food starts with planning*. Retrieved from <http://www.planning.org/newsreleases/2009/nov12.htm>
- American Public Health Association (APHA). (2007). *Toward a sustainable healthy food system* (policy number 200712). Retrieved from <http://www.apha.org/advocacy/policy/policysearch/default.htm?id=1361>
- Bunce, M., & Maurer, J. (2005). *Prospects for agriculture in the Toronto region: The farmer perspective*. Toronto: Neptis Studies on the Toronto Metropolitan Region.
- Caldwell, W. (2010, October 28). *The planner, food systems and food policy: An Ontario perspective*. Presentation at the Ontario Professional Planners Institute Symposium, Guelph, Canada.
- Campsie, P. (2008). *Food connects us all: Sustainable local food in Southern Ontario*. Toronto: Metcalf Foundation.
- Canadian Institute of Planners (CIP). (2009). *Planning Defined*. Retrieved from <http://www.cipicu.ca/web/la/en/pa/3FC2AFA9F72245C4B8D2E709990D58C3/template.asp>
- Churchyard, A. (2010). *Planning regional food systems: A guide for municipal planning and development in the Greater Golden Horseshoe*. Guelph, Canada: Ontario Farmland Trust.
- Chrisinger, B. (2009, Fall). Expanding the academic menu: Today's planning students have an appetite for food systems. *The New Planner*. Retrieved from <http://www.planning.org/thenewplanner/>
- Food Banks Canada. (2010). *Learn more about hunger in Canada*. Retrieved from <http://foodbanksCanada.ca/main2.cfm?id=10718629-B6A7-8AA0-6D9B9CE378DE06DA>
- Food Bank for New York City. (2009). *NYC Hunger Experience 2009: A year in recession*. Retrieved from <http://www.foodbanknyc.org/index.cfm?objectid=CD6F98D5-F3F8-030E-B0A0BB1C1CB8C7A0#nychungerexperience2009>
- Forkes, J. (2007). Nitrogen balance for the urban food metabolism of Toronto, Canada. *Resources, Conservation and Recycling*, 52(1), 74–94. <http://dx.doi.org/10.1016/j.resconrec.2007.02.003>
- Friedmann, H. (2005). From colonialism to green capitalism: Social movements and emergence of food regimes. In F. Buttel & P. McMichael (Eds.), *Research in Rural Sociology and Development: New Directions in the Sociology of Global Development* (Vol. 11, pp. 227–264). Greenwich, Connecticut: JAI Press Inc. [http://dx.doi.org/10.1016/S10571922\(05\)11009-9](http://dx.doi.org/10.1016/S10571922(05)11009-9)
- Hammer, J. (2004). Community food systems and planning curricula. *Journal of Planning Education and Research*, 23(4), 424–434. <http://dx.doi.org/10.1177/0739456X04264907>
- Hodgson, K. (2009, August-September). Where food planning and health intersect: Welcome to the next big trend. *Planning*, 75(8), 9–11.
- Kaufman, J. (2009, Summer). Food systems planning: Moving up the planner's ladder. *Plan Canada*, 49(2), 12–16.
- Kingsolver, B. (2007). *Animal, vegetable, miracle: A year of food life*. New York, New York: Harper Collins.
- Lang, T., & Heasman, M. (2004). Diet and nutrition policy: A clash of ideas or investment? *Development*, 47(2), 64–74. <http://dx.doi.org/10.1057/palgrave.development.1100031>
- Larsen, K., & Gilliland, J. (2008, April). Mapping the evolution of “food deserts” in a Canadian city: Supermarket accessibility in London, Ontario, 1961–2005. *International Journal of Health Geographics*, 7, 16. <http://dx.doi.org/10.1186/1476-072X-7-16>
- MacDonald, G. (2009, November 10). Chickens come home to roost in backyards around the USA. *USA Today*. Retrieved from [http://www.usatoday.com/news/nation/environment/2009-11-09-urban\\_chickens09\\_ST\\_N.htm](http://www.usatoday.com/news/nation/environment/2009-11-09-urban_chickens09_ST_N.htm)
- Magdoff, F., Buttel, F., & Foster, J. B., (Eds.). (2000). *Hungry for profit: The agribusiness threat to farmers, food and the environment*. New York, New York: Monthly Review Press.

- Morison, J. I. L., Baker, N. R., Mullineaux, P. M. & Davies, W. J. (2008). Improving water use in crop production. *Philosophical Transactions of the Royal Society Biological Sciences*, 363(1491), 639–658. <http://dx.doi.org/10.1098/rstb.2007.2175>
- Nasr, J., MacRae, R., & Kuhns, J. (2010). *Scaling up urban agriculture in Toronto: Building the infrastructure*. Toronto: George Cedric Metcalf Charitable Foundation.
- Nestle, M. (2002). Food politics, social policy. *Pacifica*, 32(4), 66.
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). (2010). Agriculture land use planning staff. Retrieved 22 July 2010 from <http://www.omafra.gov.on.ca/english/landuse/facts/staff.htm>
- Ontario Professional Planners Institute (OPPI). (2009). Healthy communities and planning for food. Retrieved from <http://www.ontarioplanners.on.ca/content/symposium/index.aspx>
- Peat, D. (2010, April 27). Backyard chickens fair or fowl? *Toronto Sun*. Retrieved from [http://www.torontosun.com/news/toronto\\_andgta/2010/04/27/13741111.html](http://www.torontosun.com/news/toronto_andgta/2010/04/27/13741111.html)
- Pollan, M. (2006). *The omnivore's dilemma: A natural history of four meals*. New York, New York: Penguin Press.
- Pollan, M. (2008). *In defense of food: An eater's manifesto*. New York, New York: Penguin Press.
- Pollan, M. (2009). *Food rules: An eater's manual*. New York, New York: Penguin Press.
- Pothukuchi, K., & Kaufman, J. (2000). The food system: A stranger to urban planning. *Journal of the American Planning Association*, 66(2), 113–124. <http://dx.doi.org/10.1080/01944360008976093>
- Power, E. (1999). Combining social justice and sustainability in food security. In M. Koc, R. MacRae, L. Mougeot, & J. Welsh (Eds.), *For hunger-proof cities: Sustainable urban food systems*. Ottawa: International Development Research Centre.
- Qualman, D., & Wiebe, N. (2002). *The structural adjustment of Canadian agriculture*. Ottawa: Canadian Centre for Policy Alternatives.
- Raja, S., Born, B., & Kozlowski Russel, J. (2008). *A planners guide to community and regional food planning: Transforming food environments, facilitating healthy eating*. Chicago, Illinois: American Planning Association.
- Redwood, M. (2009). *Agriculture in urban planning: Generating livelihoods and food security*. Ottawa: International Development Research Council.
- Schlosser, E. (2001). *Fast food nation: The dark side of the all American meal*. New York, New York: Houghton Mifflin.
- Steel, C. (2008). *Hungry city*. London: Chatto & Windus.
- Trinh, L. N., Watson, J. W., Huec, N. N., Ded, N. N., Minhe, N. V., Chuf, P., Sthapit, B. R., & Eyzaguirre, P. B. (2003). Agrobiodiversity conservation and development in Vietnamese home gardens. *Agriculture, Ecosystems and Environment*, 97, 317–344. [http://dx.doi.org/10.1016/S0167-8809\(02\)00228-1](http://dx.doi.org/10.1016/S0167-8809(02)00228-1)
- University of Wisconsin-Madison Department of Urban and Regional Planning. (1997). *Fertile ground: Food system planning for Madison/Dane County*. Final report of URPL Graduate Planning Workshop class. Department of Urban and Regional Planning, University of Wisconsin–Madison.
- U.S. Census Bureau. (2010). *Income, poverty and health insurance coverage in the United States: 2009*. Retrieved from <http://www.census.gov/prod/2010pubs/p60-238.pdf>
- Watts, M., & Goodman, D. (1997). Metabolism: Nature, culture, and industry in fin-de-siècle agro-food systems. In D. Goodman & M. Watts (Eds.), *Globalising food: Agrarian questions and global restructuring* (pp. 1-32). London: Routledge.
- Wittman, H. (2009). Reworking the metabolic rift: La Via Campesina, agrarian citizenship, and food sovereignty. *Journal of Peasant Studies*, 36(4), 805–826. <http://dx.doi.org/10.1080/03066150903353991>
- Xuereb, M. (2005). *Food miles: Environmental implications of food imports to Waterloo Region*. Waterloo, Canada: Region of Waterloo Public Health. Retrieved from [http://chd.region.waterloo.on.ca/en/research/ResourcesPublications/resources/FoodMiles\\_Report.pdf](http://chd.region.waterloo.on.ca/en/research/ResourcesPublications/resources/FoodMiles_Report.pdf)

## Measuring the food environment: From theory to planning practice

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### Abstract

The retail food environment is becoming an increasingly important consideration in land use planning decisions. Although many municipal official (or comprehensive) plans call for improved food environments, there are no standard methods by which to assess the implementation of policies reflecting these priorities. Methods developed to

assess policy enforcement should be feasible to implement by urban planners and developers, should show some correlation between food environments and residents' health or diet outcomes, and should consider a more nuanced view of food environments than solely focusing on food access. In this paper we review food environment characteristics, theories and conceptual models, and assessment methods with goal of presenting theoretical bases for the selection of food environment assessment tools by public health planners and other practitioners. We examine methods to assess food environments and discuss potential adaptations of the methods to suit the needs of urban planners. A case study of the region of Waterloo is presented to illuminate the potential of food environment assessments for healthy public policy enforcement. Finally we describe implications for public health and urban planning.

### Keywords

built environment, food environment, healthy communities, policy assessment, urban planning

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## Introduction

Evidence regarding the relationship between diet-related health outcomes and the environments within which people must make their food choices (food environment) continues to build (Black & Macinko, 2008; Frank, Kerr, Saelens, Sallis, Glanz, & Chapman, 2009; Sallis & Glanz, 2009). People who are socioeconomically disadvantaged tend to have decreased access to grocery stores (Block & Kouba, 2006; Moore & Diez Roux, 2006; Powell, Slater, Mirtcheva, Bao, & Chaloupka, 2007; Zenk, Schulz, Hollis-Neely et al., 2005) where healthy foods<sup>1</sup> tend to be more available and affordable (Block & Kouba, 2006; Bodor, Rose, Farley, Swalm, & Scott, 2008; Glanz, Sallis, Saelens, & Frank, 2007). They also have increased access to fast food outlets, where unhealthy foods tend to be more available (Fleischhacker, Evenson, Rodriguez, & Ammerman, 2011). However, relationships between people's food environments and diet and/or health status are not fully explained by socioeconomic status (Dubowitz, Heron, Bird et al., 2008). In addition to socioeconomic barriers to food access, other household- or individual-level constraints to accessing healthy food exist, such as geographic barriers, physical limitations due to difficulty lifting groceries, lack of access to a car for food shopping, or perceptions of neighborhood safety (Burns, Bentley, Thornton & Kavanagh, 2011; Casagrande et al., 2011; Cummins & MacIntyre, 2006). Neighborhoods that provide residents with access to healthy, affordable foods create a protective context in which healthy diets can be promoted and sustained.

Various researchers, practitioners and community groups are working to improve population diet quality through improvements to food environments (Ohri-Vachaspati & Leviton, 2010). At least six reviews published in the last five years indicate

the substantial interest of public health and urban planning researchers and practitioners in studying food access (Black & Macinko, 2008; Kamphuis, Giskes, de Bruijn, Wendel-Vos, Brug, & van Lenthe, 2006; McKinnon, Reedy, Morrisette, Lytle, & Yaroch, 2009; Raine et al., 2008; van der Horst et al., 2007; White, 2007). Retail food environments are becoming increasingly important considerations in land use planning decisions in Canada and other developed countries (Ashe et al., 2007; Diller & Graff, 2011; Ontario Professional Planners Institute [OPPI], 2011; OPPI, 2009). Local governments have begun conducting research to identify disparities in access to healthy food at the neighborhood level (Larsen & Gilliland, 2008; McNicoll, 2011; Region of Waterloo Public Health, 2004; Saskatoon Health Region Public Health Observatory, 2010). Meanwhile, academic researchers have created and validated tools to assess food environments based on theoretical and conceptual models of the food environment (McKinnon et al., 2009; Ohri-Vachaspati & Leviton, 2010) and explored how characteristics of the food environment might be related to diet quality and/or diet-related health outcomes (Casagrande et al., 2011; Cerin et al., 2011; Fleischhacker et al., 2011; Morland & Evenson, 2009).

Partnerships between academic researchers and local governments to study local food environments can be mutually beneficial. Specifically, current academic research demonstrating the relationship between characteristics of the food environment and health outcomes using robust, valid, and reliable tools can elucidate intervention opportunities for local governments to improve the food environments in their communities. By working collaboratively, regulatory (i.e., development and zoning) and fiscal (i.e., tax abatement) strategies can be tested as health-based interventions for their effectiveness in increasing access to, and consumption of, healthy food at the neighborhood level. Academic researchers can benefit from these partnerships by being granted the opportunity to collect behavioral and dietary data before and after changes to food environments occur, and to participate in disseminating and distilling research results into policy action. Given that there

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<sup>1</sup> Numerous definitions of healthy foods exist and can incorporate aspects of the amount of key nutrients or energy sources within foods such as fat, trans fat, salt or sugar (British Columbia Ministry of Education & British Columbia Ministry of Healthy Living and Sport, 2010), nutrient density (Drewnowski, 2005), preparation options (e.g., frying vs. baking or boiling), and the level of processing (Hamelin, Lamontagne, Ouellet, Pouliot, & Turgeon O'Brien, 2010).



are no standard measures by which to assess the food environment, development of common measures and the desire to translate research into practice are currently high priorities in the field of food environment assessment (Ohri-Vachaspati & Leviton, 2010).

In this paper we present a review of food environment characteristics, theories and conceptual models, and assessment methods for the purpose of presenting theoretical bases for the selection of food environment assessment tools to public health planners and other practitioners interested in assessing their local food environment. We also describe strategies for improving food environments and current evidence on food environment interventions. A case study is presented to illuminate the potential of food environment assessment for healthy public policy development. The paper concludes with implications for public health and urban planning professionals.

### **Food Environment Characteristics**

In general, four objectively measured characteristics of food environments have been identified as contributing to diet and/or health outcomes: food access, food availability, food affordability, and food quality (Cummins et al., 2009; Ohri-Vachaspati & Leviton, 2010).

#### *Food Access*

The concept of food access often reflects a geographical perspective of the food environment and includes measures such as proximity (i.e., distance to the nearest specified type of food outlet) (Apparicio, Cloutier, & Shearmur, 2007; Larsen & Gilliland, 2008; Sharkey & Horel, 2008; Zenk, Schulz, Israel et al., 2005), density (e.g., proportion or ratio of food stores per area, buffer zone, or population; concentration of fast food outlets as measured by locations per roadway mile) (Inagami, Cohen, Brown & Asch, 2009; Moore & Diez-Roux, 2006; Moore, Diez-Roux, Nettleton & Jacobs, 2008; Spence, Cutumisu, Edwards, Raine, & Smoyer-Tomic, 2009) and variety (e.g., number of food stores or food service places within a specified buffer zone) (Andreyeva, Blumenthal, Schwartz, Long & Brownell, 2008; Apparicio et al.,

2007; Morland & Evenson, 2009). Literature reviews examining the relationship between food access and diet and/or health outcomes have shown generally positive results, with some finding stronger relationships (Holsten, 2009; Larson, Story, & Nelson, 2009; Papas et al., 2007; Walker, Keane, & Burke, 2010) than others (Black & Macinko, 2008; White, 2007). Food access varies by area-level socioeconomic status, so that the poor have decreased access to grocery stores (Block & Kouba, 2006; Moore & Diez Roux, 2006; Powell, Slater, Mirtcheva, Bao, & Chaloupka, 2007; Zenk, Schulz, Israel, et al., 2005) and increased access to fast-food outlets (Fleischhacker et al., 2011). Interestingly, most Canadian studies differ from the international literature in that they find either no consistent patterning of food stores based on area socioeconomic status, or they find that wealthier areas have poorer food access (Apparicio et al., 2007; Black, Carpiano, Fleming & Lauster, 2011; Kestens & Daniel, 2010; Smoyer-Tomic et al., 2008; Smoyer-Tomic, Spence & Amrhein, 2006). Categorizing different store types as “healthy” (e.g., grocery stores and fruit and vegetable markets) or “unhealthy” (e.g., fast-food outlets and convenience stores) implicitly assumes that restaurant and store type adequately represent healthy food availability and quality. This assumption is not without merit, since these characteristics have been found to differ by store type (Block & Kouba, 2006; Bodor et al., 2008). However, the application of the Nutrition Environment Measures Survey (NEMS), a validated instrument, found considerable variation of food quality within specific outlet types for both stores (Glanz et al., 2007) and restaurants (Saelens, Glanz, Sallis, & Frank, 2007). Despite this, relying solely on food access has limitations, since neighborhood differences in food supply exist even after accounting for store type (Baker, Schootman, Barnidge & Kelly, 2006; Farley, Rice, Bodor, Cohen, Bluthenthal, & Rose, 2009; Horowitz, Colson, Hebert & Lancaster, 2004; Zenk, Schulz, Hollis-Neely et al., 2005). Moreover, viewing food access as merely a geographical construct ignores the reality that physical limitations, lack of access to a car for food shopping, and individual-level economic disadvantage can all impair food access

(Burns et al., 2011; Coveney & O'Dwyer, 2009; Cummins & MacIntyre, 2006). Further, social constructs such as neighborhood disorder, safety concerns, and residents' concerns about food quality may nonetheless impede residents' use of local food stores (Gittelsohn & Sharma, 2009; Odoms-Young, Zenk, & Mason, 2009). In other words, operationalizing food access as a geographically constructed variable (e.g., examining diet-related health outcomes in terms of the number of grocery stores within 0.3 mile (500m) of an individual's home or in terms of an individual's proximity to the nearest grocery store) fails to capture the lived experience of individuals because it fails to capture factors that affect food access (e.g., economic disadvantage, mobility impairments, or safety concerns).

#### *Food Availability*

The concept of food access can be considered a proxy for food availability, which is the underlying causal mechanism hypothesized to affect residents' diets (e.g., more fresh fruits and vegetables available in an area might lead to increased purchasing and consumption of fruits and vegetables by area residents, which may positively impact health). Food availability refers to the actual foods available in an area. Specific healthy food items of interest may include fruits and vegetables, whole-grain breads, lower fat milk and meat products, and low-sugar cereals (Glanz et al., 2007). Neighborhood healthy food availability, like healthy food access, has been associated with higher neighborhood income (Franco, Diez Roux, Glass, Caballero, Brancati, 2008; Gordon, Purciel-Hill, Ghai, Kaufman, Graham, & Van Wye, 2011). Lower healthy food availability was significantly associated with poorer dietary patterns, although this association became insignificant after adjusting for race (Franco et al., 2009). Contrary to its hypothesis, another study found higher healthy food availability associated with higher body weight as an indicator of lower health among urban residents of predominantly white neighborhoods, and with lower weight status among urban residents of predominantly black and low socioeconomic status (SES) neighborhoods (Casagrande et al., 2011). The authors explain their unexpected findings by

noting that individuals living in neighborhoods with low healthy food availability choose to travel outside their neighborhoods for food more often than the same subgroup living in neighborhoods with higher healthy food availability. Measuring food availability overcomes some of the limitations associated with relying solely on food access to define a healthy food environment. Specifically, there is no need to assume store type is an adequate proxy for healthy food availability when availability is directly measured.

#### *Food Affordability*

At a population level, there is an inverse relationship between the energy density of foods (kilocalories per gram) and energy cost (dollars per kilocalorie), resulting in the fact that diets high in refined grains and added fats and sugars are more affordable than the recommended diets based on whole grains, fresh vegetables and fruits, and lean meats and dairy (Drewnowski & Darmon, 2005a; Drewnowski & Darmon, 2005b). Food affordability, and specifically food and restaurant prices, has been found to exert generally small effects on body weight outcomes, although these findings also seem to vary by socioeconomic status, with the association between prices and body weight stronger among socioeconomically disadvantaged populations (Beydoun, Powell, Chen, & Wang, 2011; Powell & Chaloupka, 2009). Among children, relatively higher food prices of fruits and vegetables have been associated with lower frequency of fruit and vegetable intake (Sturm & Datar, 2011), lower fiber intake, and higher weight (Beydoun et al., 2011). In addition, relative higher prices of fast food have been associated with better diet quality among young children (Beydoun et al., 2011).

#### *Food Quality*

Finally, food quality is a characteristic of the food environment that has been found to vary by store type, with convenience stores generally selling fresh produce of lower quality than grocery stores (Glanz et al., 2007; White et al., 2004). Food quality is related to food availability in that it is the quality of available food (e.g., fruits and vegetables as well as meats and packaged foods) that influences

purchasing decisions (Zenk et al., 2011). Withered or bruised fresh fruits and vegetables, rotting meats, and expired canned or packaged foods would be an example of poor food quality. Food quality, like food access and food availability, has also been found to vary by socioeconomic status, with more disadvantaged areas selling foods of lower quality (Sloane et al., 2003; Sooman, MacIntyre, & Anderson, 1993) or perceived lower quality (Kumar, Quinn, Kriska, & Thomas, 2011). Perceptions of the quality of fresh produce have been associated with fruit and vegetable consumption (Zenk, Schulz, Hollis-Neely, et al., 2005) and identified as an important factor in food choices (Webber, Sobal, & Dollahite, 2010).

In summary, food access has been the most commonly studied food environment characteristic, and has most often been geographically operationalized, with certain food outlet types being considered “healthy” (e.g., grocery stores) or “unhealthy (e.g., fast food restaurants and convenience stores). Understanding food access solely from a geographic perspective has been criticized for failing to consider how life circumstances (for example, socioeconomic disadvantage or mobility limitations) affect access to food, and for assuming food availability is invariant across store types. Measures of food availability similarly do not consider personal factors that may limit someone’s access to healthy foods, but do go beyond measures of food access by assessing actual foods in the area rather than assuming food availability based on store type. Examining food quality and food affordability comes closer to recognizing the lived experience of acquiring food because these characteristics help to explain why someone might not purchase fresh fruits and vegetables (perhaps because they are of poor quality or too expensive), even if they are available.

### **Food Environment Theory and Conceptual Models**

Several theoretical models of how the food environment may affect food choices have been developed in the last few years (Black & Macinko, 2008; Ford & Dzewaltowski, 2008; Glanz, Sallis, Saelens & Frank, 2005; Lytle, 2009; White, 2007).

Glanz et al. present an ecological conceptual model of food environments that distinguishes between community and consumer nutrition environments. Community nutrition environments are reflected in measures of food access, while consumer nutrition environments represent characteristics of the food environment important to consumers who have already reached their food store or restaurant destinations, such as food availability, food affordability, food quality, and barriers and facilitators to healthy eating. The authors note that sociodemographic factors mediate and/or moderate the impact of environmental variables on eating patterns.

White (2007) presents a causal model for the relationship between socioeconomic factors and dietary intake, mediated by food retailing. White’s model is not as clearly ecologically constructed as the Glanz et al. (2005) model, maintaining a fairly individual-level conception of how food retailing might mediate the relationship between SES and dietary intake. For example, although his model incorporates two mediators that are extrinsic to the individual (“Use of supermarkets or local convenience stores” and “Healthiness of prepared food from fast-food outlets”), they are not identified as extra-individual in the model.

In the ecological model presented by Black and Macinko (2008), access to and quality of food and amenities is recognized as a neighborhood-level characteristic that influences dietary intake, and one that reflects characteristics of both community and consumer nutrition environments. Black & Macinko suggest that neighborhoods either act as effect modifiers or direct mediators on individual behavior, with neighborhood characteristics supporting or thwarting residents’ intentions to eat healthy foods.

Ford and Dzewaltowski (2008) present a model in which socioeconomic status moderates the impact of poor quality food environments on eating behaviors. Specifically, individual SES is viewed as a cross-level confounder on the food environment variables of interest, where individuals who are more socioeconomically disadvantaged have less

healthy eating behaviors all along the gradient of food environment quality. Ford and Dziewaltowski define a high quality food environment as one in which healthy foods are geographically accessible, available, and affordable, a definition which also reflects measures of both the community and consumer nutrition environment as conceived by Glanz et al. (2005).

Finally, Lytle's (2009) conceptual model broadens Ford and Dziewaltowski's (2008) contribution by considering the proportion of variance in eating behaviors explained by individual factors, environmental factors, and social factors. The model indicates that as individual and social factors become increasingly restricted, the environment explains a higher proportion of variance. Conversely, when individual and social factors are less restricted, environmental factors play a smaller role in explaining variance in dietary behaviors. Lytle contextualizes the importance of her conceptual model by suggesting that food environment research may be especially important in populations for whom individual and social factors are very restricted.

Most of the conceptual models described above are explicitly ecological in their construction, recognizing that characteristics of the food environment are a few of the many influences on diet quality and eating behaviors in a population (Black & Macinko, 2008; Ford & Dziewaltowski, 2008; Glanz et al., 2005; Lytle, 2009). All of the conceptual models recognize the importance of socioeconomic status as a mediator or moderator of the relationship between food environment characteristics and diet-related outcomes. Glanz and colleagues' (2005) model is especially clear in terms of organizing how researchers and practitioners can think about the food environments by distinguishing between community and consumer nutrition environments and then further identifying salient food environment characteristics such as food availability, food affordability, and food quality. This paper also highlights the importance of "distance decay" in explaining travel patterns. This approach accounts for the exponential increase in likelihood that someone will visit a destination as distance

decreases. Lytle's (2009) model is also helpful in providing theory about the differential impact of food environments on an individual's diet based on the level of restriction of other individual and social factors. Taken together, these two models (Glanz et al., 2005; Lytle, 2009) provide a comprehensive view of food environments and how they interact with other variables to affect population diet quality.

### **Food Environment Assessment Methods**

The National Cancer Institute, part of the U.S. National Institutes of Health, provides a compilation of articles and instruments that measure the food environment.<sup>2</sup> Currently the website contains over 500 articles and instruments that assess food stores, home environments, public facilities, restaurants, schools, and worksites. Ohri-Vachaspati and Leviton (2010) provide an excellent critique of available instruments in terms of ease of use, detail, resources required, and psychometric testing. The authors note that the trade-off between simplicity and low cost on one hand and detail and accuracy on the other hand mean that different potential users (e.g., researchers, practitioners, and community organizations) may opt for different assessment methods. Food environment assessment methods vary widely in terms of data collection, with observational tools including checklists (e.g., Nutrition Environment Measures Survey for Stores and Restaurants (Cerin et al., 2011; Glanz, et al., 2007; Saelens et al., 2007)), shelf-space measures of specific "healthy" vs. "unhealthy" foods (Farley et al., 2009; Rose et al., 2009), and geographic information system (GIS)-based measures such as the Retail Food Environment Index (RFEI), which scores environments based on the ratio of the number of fast-food restaurants and convenience stores to supermarkets and specialty food stores within a given buffer zone (e.g., 0.5 mile or 800m) around an individual's home (California Center for Public Health Advocacy, 2008; Spence et al., 2009). Qualitative measures and measures of residents' perceptions of their food environments have also been described, and have been found to differ from objectively measured aspects of food

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<sup>2</sup> See <https://riskfactor.cancer.gov/mfc/>

environments (Giskes et al., 2009; Moore, et al., 2008; Mujahid, Roux, Morenoff, & Raghunathan, 2007).

The following discussion elaborates on the four objective measures described above. The *Nutrition Environment Measures Studies* in stores (NEMS-S) and restaurants (NEMS-R), which were derived from the Glanz et al. (2005) conceptual model, assessed constructs associated with food purchasing in grocery stores (i.e., the availability of healthy options, price, and quality) (Glanz et al., 2007) and with food consumption in restaurants (i.e., the availability of more healthy foods, facilitators and barriers to healthy eating, pricing, and promotion of healthy and unhealthy foods) (Saelens et al., 2007). Previous studies using NEMS tools to determine healthy food availability have shown associations with residents' weight as a proxy for health (Cerin et al., 2011).

The *shelf-space measure* assesses objective geographic food availability by measuring the linear shelf space of specific healthy and unhealthy foods in food stores within a given distance of a person's home and then summing the measurements to provide "cumulative shelf space" of the specific foods (Farley et al., 2009; Rose et al., 2009). The shelf-space measure thus provides a measure of area-level food availability that can be linked to residents' homes, for example, by assessing the length of shelf space devoted to fruits and vegetables within 0.3 mile (500m) of a given address. Cumulative shelf-space availability of certain unhealthy foods, specifically energy-dense snack foods, has been positively associated with weight status (Rose et al., 2009).

Finally, the *Retail Food Environment Index (RFEI)*, a ratio of the number of fast food restaurants and convenience stores to supermarkets and specialty food stores in a given area, assesses relative access to healthy food sources. Therefore, a higher RFEI indicates a more "toxic" food environment (based on the assumption that fast food restaurants and convenience stores contribute to a toxic food environment compared to grocery and specialty stores). The RFEI has been associated with

residents' weight status in the U.S. (California Center for Public Health Advocacy, 2008) and in Canada (Spence et al., 2009).

Table 1 provides examples of different food environment assessment tools and notes the amount of expertise and resources needed to use the tools (based on Ohri-Vachaspati and Leviton's (2010) categorizations of low, moderate, and high). Assessment methods included in table 1 were chosen to indicate the range of resource-intensiveness, with the Retail Food Environment Index (RFEI) being the least resource-intensive to implement and the Nutrition Environment Measures Study (NEMS) tools being the most resource-intensive to implement. In addition, assessment methods included in table 1 were chosen to indicate the range of theoretical foundations. Specifically, researchers and practitioners who have employed the RFEI assume the importance of geographically defined food access in determining food choices or weight status, while those who employ more specific tools such as the NEMS-S or NEMS-R recognize that aspects of consumer nutrition environments (e.g., food affordability, food availability, barriers and facilitators to healthy eating) may play an important role in food purchasing and consumption behavior. Characterizing food environments as cumulative shelf space of different food items implies a more economic, consumer-driven approach to understanding food environments. Where possible, assessment tools that have previously undergone psychometric testing were included in table 1.

### **Strategies for Improving the Food Environment**

Research regarding associations between attributes of the food environment and individual-level diet and health outcomes is intended to inform "upstream" policy recommendations to improve the diet quality of the population (Lytle & Fulkerson, 2002). Policy approaches have been justified based on the idea that even if environmental influences on behavior are relatively weak, their daily influence on large segments of the population may help to facilitate improved diet quality at the population-level (Booth et al., 2001).

**Table 1: Examples of Objective Food Environment Assessment Tools**

Instrument	Food outlet type assessed	Food environment characteristic addressed	Methodology	Psychometric tests conducted?	Expertise and resources needed
NEMS-S: Checklist	Stores	<ul style="list-style-type: none"> <li>• Availability</li> <li>• Affordability</li> <li>• Quality</li> </ul>	Objective audits of food stores	Showed good inter-rater and test-retest reliability; good face and construct validity	Moderate-high
NEMS-R: Checklist	Restaurants	<ul style="list-style-type: none"> <li>• Availability</li> <li>• Affordability</li> </ul>	Objective audits of restaurants	Showed good inter-rater and test-retest reliability; good face and construct validity	Moderate-high
Shelf-space measures	Stores	<ul style="list-style-type: none"> <li>• Availability</li> </ul>	Ratio of sum of shelf space of healthy items to sum of shelf space of junk food	Showed good inter-rater reliability; good face and construct validity	Moderate
RFEI: Ratio of store types	Stores and restaurants	<ul style="list-style-type: none"> <li>• Access</li> </ul>	Geographic analysis of ratio of number of fast-food outlets and convenience stores to grocery and specialty stores	No	Moderate-high

Several strategies to improve the food environment for residents have already been employed, including limiting the number and density of fast food and other restaurants, supporting the creation of farmers' markets, community gardens, and grocery stores through financial incentives and zoning exemptions (Ashe et al., 2007; Diller & Graff, 2011). The 2009 handbook on designing healthy communities produced by Ontario Ministry of Municipal Affairs and Housing and the Ontario Professional Planners Institute (OPPI) recommends "facilitating access to local healthy foods and improving community food security" (Ministry of Municipal Affairs and OPPI, 2009, p. 7) and describes case studies of projects that have purportedly improved food access. However, the handbook neither defines healthy food access nor provides any guidelines for assessing adequate access to healthy food. More recently, the OPPI released a call to action for planning for food systems in Ontario (OPPI, 2011). Of note, the report recommends that planners, with their knowledge and experience, should be incorporated into research related to food systems.

Relevant to the current discussion is the very small number of food environment intervention studies that have been conducted to date. In part, this is because food environment interventions are complex, costly, and time-intensive. Due to this small number, several unresolved questions exist about what components compose a successful food environment intervention, whom to sample, and outcomes of interest (e.g., should food purchases or diet quality of neighborhood residents be measured?). To date, interventions have been aimed at either the consumer nutrition environment (Gittelsohn, Song, et al., 2010; Gittelsohn, Vijayadeva, et al., 2010; Song, Gittelsohn, Kim, Suratkar, Sharma, & Anliker, 2009), using measures of consumer purchases, diet behaviors and psychosocial factors related to food purchasing and diet, or the community nutrition environment (Cummins, Findlay, Higgins, Petticrew, Sparks, & Thomson, 2008; Cummins, Findlay, Petticrew, & Sparks, 2008; Wrigley, Warm, & Margetts, 2003; Wrigley, Warm, Margetts, & Whelan, 2002), using measures of store-switching behavior, diet, and psychological factors. Consumer interventions have shown positive

impacts on some food behaviors and psychosocial factors, but not others; community interventions have similarly shown modest impacts on some factors, and have further been shown to vary by “store switching” behavior (for example, one study found that those who switched to a new grocery store in a previously underserved area increased

their fruit and vegetable consumption more than those who did not switch (Wrigley, et al., 2003)). Consumer interventions have been limited by low exposure rates for respondents (for example, one study implemented the intervention in only nine of 100 local food stores (Gittelsohn, Song, et al., 2010), another in only five food stores (Gittelsohn,

**Table 2: Food environment Interventions**

Author, Year	Constructs addressed	Sample size/type; follow-up time	Intervention	Main Findings
Gittelsohn, Song, et al., 2010; Song et al., 2009	Food availability; point-of-purchase promotions	84 respondents who lived in intervention and comparison areas (48% retention rate); 18 month follow-up	10-month intervention was implemented in 9 of 100 local food stores. Intervention included print materials, working with store owners to increase or decrease supply of targeted healthy or unhealthy foods; shelf labels identifying targeted foods; information posters; incentive cards and coupons; nutrition education sessions; food samples; product giveaways; cooking demonstrations.	Intervention group: Healthy food preparation scores increased; purchasing promoted food because of shelf label increased; improvements in other food-related psychosocial factors not statistically significant.
Gittelsohn, Vijayadeva, et al., 2010	Food availability; point-of-purchase promotions	116 child-caregiver dyads from two intervention and two comparison areas; follow-up not specified	Nine- to 11-month intervention in five food stores, targeting children and caregivers. Components included increasing stocks of nutritious foods, point-of-purchase promotions, interactive sessions.	The intervention had a significant impact on caregiver knowledge and perceptions that healthy foods are convenient. Intervention group children increased their HEI score for grain servings, total consumption of water, and increased overall HEI score by 9.4%. Significant impacts were not observed for other caregiver or child psychosocial factors or behaviors.
Cummins, Findlay, Higgins, et al., 2008; Cummins, Findlay, Petticrew et al., 2008	Food access	412 respondents at follow-up from the intervention and comparison areas; 12-month follow-up	The opening of a large grocery store in a deprived area in Scotland.	There was little evidence for an intervention effect for fruit and vegetable intake or psychological health. People in the intervention group who switched to the new store for grocery shopping were not significantly different than nonswitchers in fruit and vegetable intake, but did significantly improve in measures of psychological health.
Wrigley, et al., 2002; 2003	Food access	615 respondents at follow-up; 12-month follow-up	The opening of a large grocery store in a deprived area in England.	A significant upward shift in fruit and vegetable consumption was observed among those with the poorest diets; respondents who switched to the new grocery store purchased significantly more fruit and vegetables than nonswitchers; respondents closer to the new grocery store (within 0.5 mile or 750m) ate significantly more fruits and vegetables postintervention.

Vijayadeva, et al., 2010), as well as low response rates. All intervention studies have called for increased “dose” — that is, sustained, comprehensive food environment improvements at multiple levels — for future research. The few published interventions studies and the mixed results found within the studies indicate no clear policy solutions for improving consumer or community food environments. Table 2 describes food environment interventions published to date.

### **Case Study: The Region of Waterloo**

Waterloo Region is a midsized urban municipality located in southern Ontario, Canada, and is within 200 miles (320km) of Toronto, Buffalo, and Detroit. The region includes three urban centers surrounded by four rural townships with a total population of 534,900 (Region of Waterloo Planning, Housing and Community Services, 2009). The region is governed by an upper tier regional council that sets broad directions for the community, as well as seven local city and township councils that provide more local policy solutions. Waterloo Region has historically been progressive in terms of implementing health-promoting policies. For example, the region was one of the first municipalities in Canada to implement policies to go smoke-free in bars and restaurants, as well as one of the first in Ontario to restrict pesticides in residential lawns and gardens.

In June 2009, Regional Council adopted a new Regional Official Plan (ROP) to provide a framework for decision-making on a wide range of planning issues. An official plan is comparable to a “comprehensive plan” in the United States; both documents have essentially the same intent and scope. The main difference between comprehensive plans and official plans is whether municipalities are legally required to prepare them. For example, in Canada, most municipalities are mandated to prepare official plans through provincial legislation, while most state governments do not require comprehensive plans (although municipalities in the United States are able to undertake land use planning). The ROP “contains goals, objectives and policies to manage and direct physical (land use) change and its effects on the cultural, social,

economic and natural environment of a municipality” (Region of Waterloo, 2010, para. 2). Among several interesting elements of the ROP is the stated goal of helping to create a healthy food system, which is defined as one in which “all residents have access to, and can afford to buy, safe, nutritious, and culturally-acceptable food that has been produced in an environmentally sustainable way and that sustains our rural communities” (Region of Waterloo Public Health, 2007, p. 4). This goal is unique in its explicit focus on food access and affordability and its implicit focus on quality. Specifically, while many official plans have begun to recognize food access and a healthy food environment, the ROP takes support of these issues one step further by incorporating them into specific land use bylaws (Desjardins, Lubczynski, & Xuereb, 2011).

One of the policies of the new ROP aims to provide a mix of land uses, including food destinations, within close proximity to each other to facilitate residents’ access to locally grown and healthy food products. Although the ROP does not specify how this policy should be implemented, one approach may be to require developers to describe how their proposed development would support citizens’ access to safe, nutritious, and affordable foods within the framework of a “complete development application.” Municipalities are increasingly requiring developers to submit complete development applications before the review process begins (see, for example, Section 10.D.3 of ROP) in order to avoid delays in approving applications with incomplete information. Presubmission consultation meetings are often held with municipal staff and the developer to ensure that the developer is aware of the municipality’s various policy requirements for a proposed development. Specifically, local planners identify the developer’s responsibilities for submitting relevant supporting studies, surveys, and information, including studies on transportation impact, environmental impact, and watershed implications. Measuring how the proposed development would support or enhance a healthy food environment is an additional study that could be required of the developer. The current challenge



is to implement this approach in a way that would make the measurable expectations transparent and clear to all parties involved.

While the goal of establishing healthy food environments in the ROP is certainly laudable, lack of consensus on how to best assess food environments to ensure policy enforcement presents a challenge to planners, developers, and policy-makers. Although the region of Waterloo in the past has identified food deserts (areas with reduced or no access to fresh food) within its boundaries (Region of Waterloo Public Health, 2004), a more robust methodology to assess aspects of the consumer nutrition environment (food availability, food affordability, and quality) would benefit municipal staff by providing a more nuanced understanding of food environments that exist in the communities in the region of Waterloo and by demonstrating how different food environment characteristics are associated with residents' health outcomes. Recognizing the trade-off between detail and accuracy on one hand and resource-intensiveness on the other (Ohri-Vachaspati & Leviton, 2010), region of Waterloo staff also articulated a need to identify the most effective and least resource-intensive way of measuring the food environment for future assessment endeavours, given the competing demands and costs of infrastructure, transportation, and resource-protection activities. Since the measurement of food environments is still at the developmental stage, short forms of instruments shown to adequately portray food environments and maintain statistical variance have not yet been developed (Ohri-Vachaspati & Leviton, 2010). Hence, a community-university partnership was formed between the Region of Waterloo local government interested in exploring ways to enforce policies related to creating and maintaining healthy food environments, and a group of academics involved in food environment assessment.

A study is currently underway that will attempt to address the food access needs of the Region of Waterloo. NEWPATH (Neighbourhood Environments in Waterloo Region: Patterns of Transportation and Health) is a transdisciplinary

research project aiming to evaluate how different urban built environments are associated with a variety of quality of life indicators, including physical activity, diet, food access, air pollution, and greenhouse gas emissions. The project team includes researchers and staff from the University of British Columbia, the University of Alberta, the University of Waterloo, and the Region of Waterloo. One element of this project is focused on assessing associations between food environment characteristics, diet quality, and diet-related health outcomes. This piece of the NEWPATH project employed the four food environment assessment tools described in table 1 in the Region of Waterloo. Collaboration between academic members of the research team and the Region of Waterloo public health planners to determine the most suitable methods for ensuring policy enforcement is ongoing. Specific questions to be answered include, "How accurately does each food environment assessment method predict diet-related health outcomes?"; "What method(s) would be both feasible for public health planners to implement and useful in terms of ensuring 'healthy' food environments are created and maintained as stated in the ROP?"; "Which methodologies would provide the best 'bang for the buck,' considering the multiple priorities of the Region of Waterloo?"; "How can food environment considerations be tied to complete development applications for developers interested in submitting proposals to the Region of Waterloo?"

With respect to the latter question, development review could be augmented to include an evaluation of a proposed land use action's consistency with a neighborhood-level food access plan. This implies that we first need to map out where future food outlets would be located, and to then tie this planning to zoning and development regulations that subsequently would support this type of land use action. Simply requiring space to accommodate food-serving retail does not mean it will happen, however. Therefore, food access planning at the neighborhood level also requires fiscal incentives to promote this type of land use. Evaluating a development proposal's consistency with an adopted land use plan is not new. The city of

Portland (Oregon) has instituted a “20-minute neighborhood” with a food outlet at the core to acknowledge the fundamental effect of having local access to healthy food choices.

### Conclusions


This paper reviewed food environment characteristics, theories, conceptual models, and assessment methods to provide academics and practitioners with bases for choosing the most appropriate food environment assessment tool. We also described food environment interventions. The case study of the Region of Waterloo has been presented to show how food environment assessments may aid in healthy public policy development and enforcement, and to identify specific questions to create methods for policy monitoring. The community-university partnership provides an opportunity to strengthen local food systems by integrating land use planning documents and academic research. This work can serve the practical needs of municipal staff by grounding a number of constructs of a healthy food system, namely access, availability, affordability, and the quality of healthy foods, in clear, transparent and measurable indicators. Further, the Region of Waterloo provided a setting for the community-university partnership and insight into what kinds of data are needed to create enforceable policies. This approach may be particularly useful to professional planners and developers in other jurisdictions because it sets clear expectations as to what food-related information is required for the submission of complete development applications. As the partnership continues and data analyses are completed, a clearer picture of whether some food environment constructs or assessment methods are more closely tied to health outcomes than others will emerge, thereby streamlining the amount of information required from developers in completing the applications. The results will enable municipal staff to develop requirements that are evidence-based and to provide clear and consistent expectations for all parties involved in the review process.

As mentioned, Canadian studies to date have differed from much of the international literature in that they find either no consistent patterning of

food stores based on area socioeconomic status or they find that wealthier areas have poorer food access (Apparicio et al., 2007; Black et al., 2011; Kestens & Daniel, 2010; Smoyer-Tomic et al., 2008; Smoyer-Tomic et al., 2006). These studies, however, have relied on measures of food access, and have not examined how consumer nutrition environment characteristics might be patterned by socioeconomic status. The ability of the current study to gain insight into potential socioeconomic patterning of consumer nutrition environment characteristics is a strength and will add to the food environment literature. If consumer nutrition environment characteristics are found to vary by socioeconomic factors, data from the current study could be used by municipal staff to identify priority areas for underserved populations. If the study finds no socioeconomic patterning in the consumer nutrition environment, municipal staff will still benefit from a more thorough understanding of the food environments in their community.

One limitation of attempting to develop tools for the purpose of healthy public policy enforcement is that while municipalities have the authority to approve land use and new development, their ability to control food availability (what kinds of food are sold within food stores and restaurants) and food affordability (how much healthy food costs) is very limited. Often, both healthy and unhealthy foods are available in the same food store or restaurant, and unhealthy foods tend to be cheaper (Drewnowski, 2004; Drewnowski & Darmon, 2005a; Drewnowski & Darmon, 2005b). While urban planners have no control over the foods sold or food prices within stores or restaurants, certain types of food outlets have been shown to both have more healthy foods available and at more affordable prices. For example, grocery stores, as opposed to other food stores, tend to offer the greatest variety of high-quality products at the lowest cost (Block & Kouba, 2006; Bodor et al., 2008; Chung & Myers, 1999; Glanz et al., 2007). A final limitation of this work is that food environment assessments were only conducted in urban environments and therefore may not be applicable to rural environments. However, given that approximately 80% of Canadians reside

in urban areas (Human Resources and Skills Development Canada, 2011), it stands to reason that the tools developed will be applicable to the majority of Canadians. Despite these limitations, going forward to create a checklist for developers with the best evidence currently available in order to support healthy food environments is a commendable objective, and may create more opportunities for residents to maintain a healthy diet than perspectives or practices that vary from planner to planner.

The benefit of employing a variety of methods to assess the strength of associations between aspects of the food environment and residents' diet and health outcomes is that a clearer picture of how and what to measure emerges. By creating a tool that focuses on aspects of the food environment that are related to diet and health outcomes of residents, development proposals can undergo a concise and pointed examination of how the proposal will address the most important of the outcomes of interest. 

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### References

Andreyeva, T., Blumenthal, D. M., Schwartz, M. B., Long, M. W., & Brownell, K. D. (2008). Availability and prices of foods across stores and neighborhoods: The case of New Haven, Connecticut. *Health Affairs*, 27(5), 1381–1388. <http://dx.doi.org/10.1377/hlthaff.27.5.1381>

- Apparicio, P., Cloutier, M.-S., & Shearmur, R. (2007). The case of Montreal's missing food deserts: Evaluation of accessibility to food supermarkets. *International Journal of Health Geographics*, 6(4). <http://dx.doi.org/10.1186/1476-072X-6-4>
- Ashe, M., Feldstein, L. M., Graff, S., Kline, R., Pinkas, D., Zellers, L. (2007). Local venues for change: Legal strategies for healthy environments. *Journal of Law, Medicine & Ethics*, 35(1), 138–147. <http://dx.doi.org/10.1111/j.1748-720X.2007.00118.x>
- Baker, E. A., Schootman, M., Barnidge, E., & Kelly, C. (2006). The role of race and poverty in access to foods that enable individuals to adhere to dietary guidelines. *Preventing Chronic Disease*, 3(3), A76.
- Beydoun, M. A., Powell, L. M., Chen, X., & Wang, Y. (2011). Food prices are associated with dietary quality, fast food consumption, and body mass index among U.S. children and adolescents. *The Journal of Nutrition*, 141, 304–311. <http://dx.doi.org/10.3945/jn.110.132613>
- Black, J. L., Carpiano, R. M., Fleming, S., & Lauster, N. (2011). Exploring the distribution of food stores in British Columbia: Associations with neighbourhood sociodemographic factors and urban form. *Health & Place*, 17(4), 961–970. <http://dx.doi.org/10.1016/j.healthplace.2011.04.002>
- Black, J. L., & Macinko, J. (2008). Neighborhoods and obesity. *Nutrition Reviews*, 66(1), 2–20. <http://dx.doi.org/10.1111/j.1753-4887.2007.00001.x>
- Block, D., & Kouba, J. (2006). A comparison of the availability and affordability of a market basket in two communities in the Chicago area. *Public Health Nutrition*, 9, 837–845. <http://dx.doi.org/10.1017/PHN2005924>
- Bodor, J. N., Rose, D., Farley, T. A., Swalm, C., & Scott, S. K. (2008). Neighbourhood fruit and vegetable availability and consumption: The role of small food stores in an urban environment. *Public Health Nutrition*, 11(4), 413–420. <http://dx.doi.org/10.1017/S1368980007000493>
- Booth, S. L., Mayer, J., Sallis, J. F., Ritenbaugh, C., Hill, J. O., Birch, L. L.,...Hays, N. P. (2001). Environmental and societal factors affect food choice and physical activity: Rationale, influences, and leverage points. *Nutrition Reviews*, 59(3), S21–S39. <http://dx.doi.org/10.1111/j.1753-4887.2001.tb06983.x>

- British Columbia Ministry of Education, and British Columbia Ministry of Healthy Living and Sport. (2010). *Guidelines for food and beverage sales in BC schools*. British Columbia: Author.
- Burns, C., Bentley, R., Thornton, L., & Kavanagh, A. (2011). Reduced food access due to a lack of money, inability to life and lack of access to a car for food shopping: A multilevel study in Melbourne, Victoria. *Public Health Nutrition*, 14(6), 1017–1023.  
<http://dx.doi.org/10.1017/S136898001000385X>
- California Center for Public Health Advocacy. (2008). *Designed for disease: The link between local food environments and obesity and diabetes*. UCLA Center for Health Policy Research. Davis, California: Author.
- Casagrande, S. S., Franco, M., Gittelsohn, J., Zonderman, A. B., Evans, M. K., Kuczmarski, M. F., & Gary-Webb, T. L. (2011). Healthy food availability and the association with BMI in Baltimore, Maryland. *Public Health Nutrition*, 14(6), 1001–1007.  
<http://dx.doi.org/10.1017/S1368980010003812>
- Cerin, E., Frank, L. D., Sallis, J. F., Saelens, B. E., Conway, T. L., Chapman, J. E., & Glanz, K. (2011). From neighborhood design and food options to residents' weight status. *Appetite*, 56, 693–703.  
<http://dx.doi.org/10.1016/j.appet.2011.02.006>
- Chung, C., & Myers, J. (1999). Do the poor pay more for food? An analysis of grocery store availability and food price disparities. *Journal of Consumer Affairs*, 33, 276–296. <http://dx.doi.org/10.1111/j.1745-6606.1999.tb00071.x>
- Coveney, J., & O'Dwyer, L. A. (2009). Effects of mobility and location on food access. *Health & Place*, 15, 45–55. <http://dx.doi.org/10.1016/j.healthplace.2008.01.010>
- Cummins, S., Findlay, A., Higgins, C., Petticrew, M., Sparks, L., & Thomson, H. (2008). Reducing inequalities in health and diet: Findings from a study on the impact of a food retail development. *Environment and Planning A*, 40(2), 402–422.  
<http://dx.doi.org/10.1068/a38371>
- Cummins, S., Findlay, A., Petticrew, M., & Sparks, L. (2008). Retail-led regeneration and store-switching behaviour. *Journal of Retailing and Consumer Services*, 15(4), 288–295.  
<http://dx.doi.org/10.1016/j.jretconser.2007.06.002>
- Cummins, S., & Macintyre, S. (2006). Food environments and obesity – neighbourhood or nation? *International Journal of Epidemiology*, 35, 100–104. <http://dx.doi.org/10.1093/ije/dyi276>
- Cummins, S., Smith, D. M., Taylor, M., Dawson, J., Marshall, D., Sparks, L., & Anderson, A. S. (2009). Variations in fresh fruit and vegetable quality by store type, urban-rural setting and neighbourhood deprivation in Scotland. *Public Health Nutrition*, 12(11), 2044–2050.  
<http://dx.doi.org/10.1017/S1368980009004984>
- Desjardins, E., Lubczynski, J., & Xuereb, M. (2011). Incorporating policies for a healthy food system into land-use planning: The case of Waterloo Region, Canada. *Journal of Agriculture, Food Systems & Community Development*, 2(1), 1–13.  
<http://dx.doi.org/10.5304/jafscd.2011.021.003>
- Diller, P. A., & Graff, S. (2011). Regulating food retail for obesity prevention: How far can cities go? *Journal of Law, Medicine & Ethics*, 39(S1), 89–93.  
<http://dx.doi.org/10.1111/j.1748-720X.2011.00575.x>
- Drewnowski, A. (2004). Obesity and the food environment: Dietary energy density and diet costs. *American Journal of Preventive Medicine*, 27(S3), S154–162.  
<http://dx.doi.org/10.1016/j.amepre.2004.06.011>
- Drewnowski, A. (2005). Concept of a nutritious food: Toward a nutrient density score. *The American Journal of Clinical Nutrition*, 82(4), 721–732.
- Drewnowski, A., & Darmon, N. (2005a). The economics of obesity: Dietary energy density and energy cost. *American Journal of Clinical Nutrition*, 82(S1), S265–S273.
- Drewnowski, A., & Darmon, N. (2005b). Food choices and diet costs: An economic analysis. *Journal of Nutrition*, 135(4), 900–904.
- Dubowitz, T., Heron, M., Bird, C. E., Lurie, N., Finch, B. K., Basurto-Dávila, R., Hale, L., & Escarce, J. J. (2008). Neighborhood socioeconomic status and fruit and vegetable intake among whites, blacks, and Mexican Americans in the United States. *American Journal of Clinical Nutrition*, 87, 1883–1891
- Farley, T. A., Rice, J., Bodor, J. N., Cohen, D. A., Bluthenthal, R. N., & Rose, D. (2009). Measuring the food environment: Shelf space of fruits, vegetables, and snack foods in stores. *Journal of Urban Health*, 86(5), 672–682.  
<http://dx.doi.org/10.1007/s11524-009-9390-3>

- Fleischhacker, S. E., Evenson, K. R., Rodriguez, A., & Ammerman, A. S. (2011). A systematic review of fast food access studies. *Obesity Reviews*, 12, e460–e471. <http://dx.doi.org/10.1111/j.1467-789X.2010.00715.x>
- Ford, P. B., & Dzawaltowski, D. A. (2008). Disparities in obesity prevalence due to variation in the retail food environment: Three testable hypotheses. *Nutrition Reviews*, 66(4), 216–228. <http://dx.doi.org/10.1111/j.1753-4887.2008.00026.x>
- Franco, M., Diez Roux, A. V., Glass, T. A., Caballero, B., & Brancati, F. (2008). Neighborhood characteristics and availability of healthy foods in Baltimore. *American Journal of Preventive Medicine*, 35(6), 561–567. <http://dx.doi.org/10.1016/j.amepre.2008.07.003>
- Franco, M., Diez-Roux, A. V., Nettleton, J. A., Lazo, M., Brancati, F., Caballero, B., Glass, T., & Moore, L. V. (2009). Availability of healthy foods and dietary patterns: The Multi-Ethnic Study of Atherosclerosis. *American Journal of Clinical Nutrition*, 89, 897–904. <http://dx.doi.org/10.3945/ajcn.2008.26434>
- Frank, L., Kerr, J., Saelens, B., Sallis, J., Glanz, K., & Chapman, J. (2009). Food outlet visits, physical activity and body weight. Variations by gender and race-ethnicity. *British Journal of Sports Medicine*, 43, 124–131. <http://dx.doi.org/10.1136/bjism.2008.055533>
- Giskes, K., van Lenthe, F., Kamphuis, C. B. M., Huisman, M., Brug, J., & Mackenbach, J. P. (2009). Household and food shopping environments: Do they play a role in socioeconomic inequalities in fruit and vegetable consumption? A multilevel study among Dutch adults. *Journal of Epidemiology and Community Health*, 63, 113–120. <http://dx.doi.org/10.1136/jech.2008.078352>
- Gittelsohn, J. & Sharma, S. (2009). Physical, consumer, and social aspects of measuring the food environment among diverse low-income populations. *American Journal of Preventive Medicine*, 36(4 Suppl.), S161–S165. <http://dx.doi.org/10.1016/j.amepre.2009.01.007>
- Gittelsohn, J., Song, H. J., Suratkar, S., Kumar, M. B., Henry, E. G., Sharma, S., ... Anliker, J. (2010). An urban food store intervention positively affects food-related psychosocial variables and food behaviors. *Health Education & Behavior*, 37(3), 390–402. <http://dx.doi.org/10.1177/1090198109343886>
- Gittelsohn, J., Vijayadeva, V., Davison, N., Ramirez, V., Cheung, L. W. K., Murphy, S., & Novotny, R. (2010). A food store intervention trial improves caregiver psychosocial factors and children's dietary intake in Hawaii. *Obesity*, 18(S1), S84–S90. <http://dx.doi.org/10.1038/oby.2009.436>
- Glanz, K., Sallis, J. F., Saelens, B. E., & Frank, L. D. (2005). Healthy nutrition environments: Concepts and measures. *American Journal of Health Promotion*, 19(5), 330–333. <http://dx.doi.org/10.4278/0890-1171-19.5.330>
- Glanz, K., Sallis, J. F., Saelens, B. E., & Frank, L. D. (2007). Nutrition environment measures survey in stores (NEMS-S) - Development and evaluation. *American Journal of Preventive Medicine*, 32(4), 282–289. <http://dx.doi.org/10.1016/j.amepre.2006.12.019>
- Gordon, C., Purciel-Hill, M., Ghai, N. R., Kaufman, L., Graham, R., & Van Wye, G. (2011). Measuring food deserts in New York City's low-income neighborhoods. *Health & Place*, 17(2), 696–700. <http://dx.doi.org/10.1016/j.healthplace.2010.12.012>
- Hamelin, A. M., Lamontagne, C., Ouellet, D., Pouliot, N., & Turgeon O'Brien, H. (2010). Healthful eating: Beyond food, a global concept. *Canadian Journal of Dietetic Practice and Research*, 71(2), e21–e27. <http://dcjournal.metapress.com/content/x124031366k74kp7/?p=19755a0eab214a189c1903cc0e865b68&pi=0>
- Holsten, J. E. (2009). Obesity and the community food environment: A systematic review. *Public Health Nutrition*, 12, 1–9
- Horowitz, C. R., Colson, K. A., Hebert, P. L., & Lancaster, K. (2004). Barriers to buying healthy foods for people with diabetes: Evidence of environmental disparities. *American Journal of Public Health*, 94(9), 1549–1554. <http://dx.doi.org/10.2105/AJPH.94.9.1549>
- Human Resources and Skills Development Canada. (2011). Canadians in context – geographic distribution. Retrieved from <http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=34>
- Inagami, S., Cohen, D. A., Brown, A. F., & Asch, S. M. (2009). Body mass index, neighborhood fast food and restaurant concentration, and car ownership. *Journal of Urban Health*. 86(5), 683–695. <http://dx.doi.org/10.1007/s11524-009-9379-y>

- Kamphuis, C. B. M., Giskes, K., de Bruijn, G. J., Wendel-Vos, W., Brug, J., & van Lenthe, F. J. (2006). Environmental determinants of fruit and vegetable consumption among adults: A systematic review. *British Journal of Nutrition*, 96(4), 620–635.
- Kestens, Y., & Daniel, M. (2010). Social inequalities in food exposure around schools in an urban area. *American Journal of Preventive Medicine*, 39(1), 33–40. <http://dx.doi.org/10.1016/j.amepre.2010.03.014>
- Kumar, S., Quinn, S. C., Kriska, A. M., & Thomas, S. B. (2011). “Food is directed to the area”: African Americans’ perceptions of the neighbourhood nutrition environment in Pittsburgh. *Health & Place*, 17(1), 370–378. <http://dx.doi.org/10.1016/j.healthplace.2010.11.017>
- Larsen, K., & Gilliland, J. (2008). Mapping the evolution of “food deserts” in a Canadian city: Supermarket accessibility in London, Ontario, 1961–2005. *International Journal of Health Geographics*, 7(1). <http://dx.doi.org/10.1186/1476-072X-7-16>
- Larson, N., Story, M., & Nelson, M. (2009). Neighborhood environments, disparities in access to healthy foods in the US. *American Journal of Preventive Medicine*, 36, 74–81. <http://dx.doi.org/10.1016/j.amepre.2008.09.025>
- Lytle, L. A. (2009). Measuring the food environment: State of the science. *American Journal of Preventive Medicine*, 36(4S), S134–S144. <http://dx.doi.org/10.1016/j.amepre.2009.01.018>
- Lytle, L. A., & Fulkerson, J. A. (2002). Assessing the dietary environment: Examples from school-based nutrition interventions. *Public Health Nutrition*, 5(6A), 893–899. <http://dx.doi.org/10.1079/PHN2002384>
- McKinnon, R. A., Reedy, J., Morrisette, M. A., Lytle, L. A., & Yaroch, A. L. (2009). Measures of the food environment: A compilation of the literature, 1990–2007. *American Journal of Preventive Medicine*, 36(4S), S124–S133. <http://dx.doi.org/10.1016/j.amepre.2009.01.012>
- McNicoll, S. (2011). Toronto’s food deserts. Retrieved June 27, 2011, from <http://sustainontario.com/2011/02/08/4050/blog/good-food-ideas-for-kids/torontos-food-deserts>
- Ministry of Municipal Affairs and Housing, and the Ontario Professional Planners Institute (OPPI). (2009, Fall). *Planning by design: A healthy communities handbook*. Retrieved from [http://www.ontarioplanners.on.ca/pdf/Healthy\\_Communities\\_Handbook.pdf](http://www.ontarioplanners.on.ca/pdf/Healthy_Communities_Handbook.pdf)
- Moore, L. V. & Diez Roux, A. V. (2006). Associations of neighborhood characteristics with the location and type of food stores. *American Journal of Public Health*, 96, 325–331. <http://dx.doi.org/10.2105/AJPH.2004.058040>
- Moore, L. V., Diez Roux, A. V., Nettleton, J. A., & Jacobs, D. R. (2008). Associations of the local food environment with diet quality: A comparison of assessments based on surveys and geographic information systems. *American Journal of Epidemiology*, 167(8), 917–924. <http://dx.doi.org/10.1093/aje/kwm394>
- Morland, K. B., & Evenson, K. R. (2009). Obesity prevalence and the local food environment. *Health & Place*, 15, 491–495. <http://dx.doi.org/10.1016/j.healthplace.2008.09.004>
- Mujahid, M. S., Roux, A. V. D., Morenoff, J. D., & Raghunathan, T. (2007). Assessing the measurement properties of neighborhood scales: From psychometrics to ecometrics. *American Journal of Epidemiology*, 165(8), 858–867. <http://dx.doi.org/10.1093/aje/kwm040>
- Odoms-Young, A. M., Zenk, S., & Mason, M. (2009). Measuring food availability and access in African-American communities: Implications for intervention and policy. *American Journal of Preventive Medicine*, 36(4 Suppl.), S145–S150. <http://dx.doi.org/10.1016/j.amepre.2009.01.001>
- Ohri-Vachaspati, P., & Leviton, L. C. (2010). Measuring food environments: A guide to available instruments. *American Journal of Health Promotion*, 24(6), 410–426. <http://dx.doi.org/10.4278/ajhp.080909-LIT-190>
- Ontario Professional Planners Institute (OPPI). (2011). Planning for food systems in Ontario: A call to action. Retrieved from [http://www.ontarioplanners.on.ca/pdf/a\\_call\\_to\\_action\\_from\\_oppi\\_june\\_24\\_2011.pdf](http://www.ontarioplanners.on.ca/pdf/a_call_to_action_from_oppi_june_24_2011.pdf)
- Papas, M. A., Alberg, A. J., Ewing, R., Helzlsouer, K. J., Gary, T. L., & Klassen, A. C. (2007). The built environment and obesity. *Epidemiological Reviews*, 29, 129–143. <http://dx.doi.org/10.1093/epirev/mxm009>

- Powell, L. M., & Chaloupka, F. J. (2009). Food prices and obesity: evidence and policy implications for taxes and subsidies. *The Millbank Quarterly*, 87(1), 229–257. <http://dx.doi.org/10.1111/j.1468-0009.2009.00554.x>
- Powell, L. M., Slater, S., Mirtcheva, D., Bao, Y., & Chaloupka, F. J. (2007) Food store availability and neighborhood characteristics in the United States. *Preventive Medicine*, 44(3), 189–195. <http://dx.doi.org/10.1016/j.ypmed.2006.08.008>
- Raine, K., Spence, J. C., Church, J., Boulé, N., Slater, L., Marko, J.,...Hemphill, E. (2008). *State of the evidence review on urban health and healthy weights*. Canadian Institute for Health Information (CIHI), Ottawa: Publisher.
- Region of Waterloo. (2010). New ROP - Home. Retrieved from <http://www.region.waterloo.on.ca/web/region.nsf/97dfc347666efede85256e590071a3d4/4a94f7b34be852628525746400708c7cOpenDocument>
- Region of Waterloo Planning, Housing and Community Services. (2009). Planning Information Bulletin: Population and employment forecasts 2006–2029. Retrieved from [http://www.region.waterloo.on.ca/web/region.nsf/DocID/A288897047333422852573700060C1D7/\\$file/Population and Employment Forecasts.pdf?openement](http://www.region.waterloo.on.ca/web/region.nsf/DocID/A288897047333422852573700060C1D7/$file/Population%20and%20Employment%20Forecasts.pdf?openement)
- Region of Waterloo Public Health. (2007). A healthy community food system plan. Retrieved June 27, 2011, from [http://chd.region.waterloo.on.ca/web/health.nsf/8f9c046037662cd985256af000711418/54ED787F44ACA44C852571410056AEB0/\\$file/FoodSystem\\_Plan.pdf?openement](http://chd.region.waterloo.on.ca/web/health.nsf/8f9c046037662cd985256af000711418/54ED787F44ACA44C852571410056AEB0/$file/FoodSystem_Plan.pdf?openement)
- Region of Waterloo Public Health. (2004). Building healthy and supportive communities: A glance at access to food. Retrieved June 27, 2011, from <http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/FoodAccess.pdf>
- Rose, D., Hutchinson, P. L., Bodor, J. N., Swalm, C. M., Farley, T. A., Cohen, D. A., & Rice, J. C. (2009). Neighborhood food environments and body mass index: The importance of in-store contents. *American Journal of Preventive Medicine*, 37(3), 214–219. <http://dx.doi.org/10.1016/j.amepre.2009.04.024>
- Saelens, B. E., Glanz, K., Sallis, J. F., & Frank L. D. (2007). Nutrition environment measures study in restaurants (NEMS-R) - Development and evaluation. *American Journal of Preventive Medicine*, 32(4), 273–281. <http://dx.doi.org/10.1016/j.amepre.2006.12.022>
- Sallis, J. F., & Glanz, K. (2009). Physical activity and food environments. Solutions to the obesity epidemic. *The Milbank Quarterly*, 87, 123–154. <http://dx.doi.org/10.1111/j.1468-0009.2009.00550.x>
- Saskatoon Health Region Public Health Observatory. (2010). Food access in Saskatoon. Retrieved June 27, 2011, from [http://www.saskatoonhealthregion.ca/your\\_health/documents/PHO/CommunityFoodAccessReport\\_TwoPgSummary.pdf](http://www.saskatoonhealthregion.ca/your_health/documents/PHO/CommunityFoodAccessReport_TwoPgSummary.pdf)
- Sharkey, J. R., & Horel, S. (2008). Neighborhood socioeconomic deprivation and minority composition are associated with better potential spatial access to the ground-truthed food environment in a large rural area. *Journal of Nutrition*, 138(3), 620–627.
- Sloane, D. C., Diamant, A. L., Lewis, L. B., Yancey, A. K., Flynn, G., Nascimento, L. M. et al. (2003). Improving the nutritional resource environment for healthy living through community-based participatory research, *Journal of General Internal Medicine*, 18, 568–575. <http://dx.doi.org/10.1046/j.1525-1497.2003.21022.x>
- Smoyer-Tomic, K. E., Spence, J. C., & Amrhein, C. (2006). Food deserts in the prairies? Supermarket accessibility and neighbourhood need in Edmonton, Canada. *Professional Geographer*, 58, 307–326. <http://dx.doi.org/10.1111/j.1467-9272.2006.00570.x>
- Smoyer-Tomic, K. E., Spence, J. C., Raine, K. D., Amrhein, C., Cameron, N., Yasenovskiy, V.,...Healy, J. (2008). The association between neighborhood socioeconomic status and exposure to supermarkets and fast food outlets, *Health & Place*, 14(4), 740–754. <http://dx.doi.org/10.1016/j.healthplace.2007.12.001>
- Song, H. J., Gittelsohn, J., Kim, M., Suratkar, S., Sharma, S., & Anliker, J. (2009). A corner store intervention in a low-income urban community is associated with increased availability and sales of some healthy foods. *Public Health Nutrition*, 12(11), 2060–2067. <http://dx.doi.org/10.1017/S1368980009005242>

- Sooman, A., MacIntyre, S., & Anderson, A. (1993). Scotland's Health—a more difficult challenge for some? The price and availability of healthy foods in socially contrasting localities in the West of Scotland. *Health Bulletin*, 51, 276–284.
- Spence, J. C., Cutumisu, N., Edwards, J., Raine, K. D., & Smoyer-Tomic, K. (2009). Relation between local food environments and obesity among adults. *BMC Public Health*, 9, 192.  
<http://dx.doi.org/10.1186/1471-2458-9-192>
- Sturm, R., & Datar, A. (2011). Regional price differences and food consumption frequency among elementary school children. *Public Health*, 125(3), 136–141.  
<http://dx.doi.org/10.1016/j.puhe.2010.11.016>
- van der Horst, K., Oenema, A., Ferreira, I., Wendel-Vos, W., Giskes, K., van Lenthe, F., & Brug, J. (2007). A systematic review of environmental correlates of obesity-related dietary behaviors in youth. *Health Education Research*, 22(2), 203–226.  
<http://dx.doi.org/10.1093/her/cyl069>
- Walker, R. E., Keane, C. R., & Burke, J. G. (2010). Disparities and access to healthy food in the United States: A review of food deserts literature. *Health & Place*, 16(5), 876–884. <http://dx.doi.org/10.1016/j.healthplace.2010.04.013>
- Webber, C. B., Sobal, J., & Dollahite, J. S. (2010). Shopping for fruits and vegetables. Food and retail qualities of importance to low-income households at the grocery store. *Appetite*, 54, 297–303.  
<http://dx.doi.org/10.1016/j.appet.2009.11.015>
- White, M. (2007). Food access and obesity. *Obesity Reviews*, 8, 99–107. <http://dx.doi.org/10.1111/j.1467-789X.2007.00327.x>
- White, M., Williams, E., Raybould, S., Adamson, A., Bunting, J., & Mathers, J. (2004). Do food deserts exist? A multi-level geographical analysis of the relationship between retail food access, socio-economic position and dietary intake. Final report to the Food Standards Agency, UK School of Health Sciences, University of Newcastle upon Tyne, Newcastle.
- Wrigley, N., Warm, D., & Margetts, B. (2003). Deprivation, diet, and food-retail access: Findings from the Leeds “food deserts” study. *Environment and Planning A*, 35(1), 151–188.  
<http://dx.doi.org/10.1068/a35150>
- Wrigley, N., Warm, D., Margetts, B., & Whelan, A. (2002). Assessing the impact of improved retail access on diet in a “food desert”: A preliminary report. *Urban Studies*, 39(11), 2061–2082.  
<http://dx.doi.org/10.1080/0042098022000011362>
- Zenk, S. N., Odoms-Young, A. M., Dallas, C., Hardy, E., Watkins, A., Hoskins-Wroten, J., & Holland, L. (2011). You have to hunt for the fruits, the vegetables: Environmental barriers and adaptive strategies to acquire food in a low-income African American neighborhood. *Health Education & Behavior*, 38(3), 282–292.  
<http://dx.doi.org/10.1177/1090198110372877>
- Zenk, S. N., Schulz, A. J., Hollis-Neely, T., Campbell, R. T., Holmes, N., Watkins, G., Nwankwo, R., & Odoms-Young, A. (2005). Fruit and vegetable intake in African Americans: Income and store characteristics. *American Journal of Preventive Medicine*, 29(1), 1–9.  
<http://dx.doi.org/10.1016/j.amepre.2005.03.002>
- Zenk, S. N., Schulz, A. J., Israel, B. A., James, S. A., Bao, S. M., & Wilson, M. L. (2005). Neighborhood racial composition, neighborhood poverty, and the spatial accessibility of supermarkets in metropolitan Detroit. *American Journal of Public Health*. 95(4), 660–667. <http://dx.doi.org/10.2105/AJPH.2004.042150>



## Emerging assessment tools to inform food system planning

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### Abstract

Food system planning is an emerging field engaging planners and planning organizations, civic leaders, citizens, food policy councils, and others interested in creating more sustainable food systems. Planning practices are being developed to address the complex soil-to-soil food system, which spans production to consumption to reuse and recycling of waste. Community engagement is critical to fostering interactions within the full

spectrum of food system stakeholders — from farmers and ranchers to planners and local officials to individual and institutional consumers. A growing body of assessment tools is being developed to inform this process. As most of these tools are relatively new, there is little research that addresses the different methodologies or evaluates their use as planning tools. This paper outlines a variety of approaches and suggests further research to evaluate their efficacy.

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### Keywords

community food assessment, comprehensive planning, food system assessment, food system planning, food systems evaluation, foodsheds, local food and farm economies

### Background

Food system planning is an emerging field that engages citizens, food policy councils, planning professionals, civic officials, and others interested in creating more sustainable food systems. While many disciplines within the planning profession

have established best practices that span data collection methods, visioning, design charrettes, and community decision-making, planners are only beginning to develop practices that address the complex soil-to-soil food system, which spans from production to consumption to reuse and recycling of waste. Similarly, while people engaged in sustainable agriculture have addressed food system issues for many years, they could gain insights from the planning field, which emphasizes systems-based approaches and relies heavily on data assessment and community engagement tools.

As recently as 2000, Kameshwari Pothukuchi and Jerome Kaufman pointed out that the food system is “notable by its absence from most planning practice, research, and education” (p. 113). Despite the fact that planning practice is “concerned with community systems — such as land use, housing, transportation, the environment, and the economy — and their interconnections” (Pothukuchi & Kaufman, p. 113), until 2008 food was not included in mainstream planning activities. When it did occur, planning efforts typically were led by food system stakeholders and people working in fields related to sustainable agriculture and community food security. As one example, the Leopold Center at Iowa State University published a guide for citizen groups entering into local food system planning (Pirog et al., 2006).

In 2007, the American Planning Association (APA) addressed this gap in planning practice with its *Policy Guide on Community and Regional Food Planning*, which stated, “Yet among the basic essentials for life — air, water, shelter, and food — only food has been absent over the years as a focus of serious professional planning interest. This is a puzzling omission because, as a discipline, planning marks its distinctiveness by being comprehensive in scope and attentive to the temporal dimensions and spatial interconnections among important facets of community life” (p. 1). Since then, food system planning has emerged as an exciting new field that is beginning to connect agricultural land use with economic development, public health, community food security and, to a lesser extent, environmental protection.

At its best, food system planning addresses the entire life cycle of food: from natural resource management and the cultivation of crops and livestock, through processing, packaging, and distribution of food, to acquisition and consumption at homes, cafeterias, and restaurants, and ending with disposal in a waste facility or reuse as compost applied to a field. More typically, food planning addresses a narrow part of this spectrum. As a result, each plan has a different mission and a different emphasis. For example, hunger advocates tend to focus on food security, public health focuses on obesity, farmland protection groups highlight the land base needed to support local or regional diets, and economists generally concentrate on job creation and economic development.

Since 2010, however, a flurry of new food system plans have been released in various parts of the country that address everything from farmland protection to healthy food access — integrating, for example, the prevailing public costs for food-related disease into new economic opportunities, and fashioning community wealth-creation opportunities in low-income neighborhoods. Many address food justice concerns as well. Despite a lack of low-income participation in existing alternative agri-food movements (Guthman, 2006), planners often employ tools such as community-based assessments and stakeholder participation to incorporate the needs of all individuals. While in the past most plans focused on parts of the food system rather than the whole system, some of the newer plans are truly comprehensive and increasingly are supported by thorough data analysis.

Since many of the assessment tools used to inform these plans are new, there is little objective evaluation of their efficacy. However, their future-oriented nature and focus on assets and liabilities make them similar to other assessment tools that are used at the beginning stages of the professional planning process. Needs assessments may be useful in prioritizing public policy in the areas of greatest need (Percy-Smith, 1996). Environmental impact assessments are required by law to determine the effect of new plans (Nagarajan, 1999), and are valuable tools for promoting sustainable develop-

ment (Benson, 2003). Health impact assessments are useful both in the creation of plans and to traditional planning outcomes such as contributing to social capital and institutional change (Slotterback, 2011). These assessments have all contributed information to the planning process and facilitated collaborations across disciplines, suggesting that similar assessments of the food system should prove valuable for the beginning stages of food systems planning.

Different tools can help diverse interests develop plans and policies to achieve their goals. With their interdisciplinary systems training and cross-sectoral work, planners are well suited to work with communities and multiple stakeholders to build sustainable food systems that address all of these interests together. Planners are trained in the political process and in ways to facilitate incorporating stakeholder involvement at all levels of policy-making. Whether leading or supporting, planner engagement in food system efforts brings valuable perspectives and methods to the table, as they are trained to solicit community involvement and often have proprietary data sets that can be of value to comprehensive food system assessments. Assessment tools are needed to support community as well as professional efforts to create safe, secure and resilient food systems.

The following sections outline tools that planners, as well as professional and community advocates for sustainable food systems, are using to support food system planning efforts. Examples are not comprehensive, but demonstrate what is addressed in a typical assessment of each type. Two of the newest types of assessments, foodshed and food system assessments, are noted first because of their increasing use and appeal to local and regional food system planning.

A variety of assessment tools have been used in recent years that bring food system and planning professionals together to establish a baseline of information and set goals for comprehensive food system planning efforts. These tools vary in methodology and scope, and as such define the problems associated with contemporary food systems

differently. This paper attempts to catalogue the different types of assessments currently in use, in order to provide food system planners with an understanding of the tools available to assist them.

So far, there are no agreed-upon definitions of assessment typologies that differentiate one tool from another, and sometimes one assessment tool will fit into more than one category. This article represents one of the first attempts to separate the different assessments into typological categories. Table 1 lists exemplary assessments along with summary characteristics, such as their key purposes and methodologies. It also presents profiles of a few “typical” reports that demonstrate both the strengths and weaknesses of different assessment tools.

### **Foodshed Assessments**

Based metaphorically on the concept of a watershed,<sup>1</sup> a “foodshed” is a way to identify the geography of prevailing or future sources of food for a given region, or to trace the movement of food from agricultural regions to a specified population center. Ultimately drawn from John Wesley Powell’s classic 1878 definition of a watershed, “. . . within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community,” Kloppenburg, Hendrickson, and Stevenson (1996) describe a foodshed as a “unifying and organizing metaphor for conceptual development that starts from a premise of the unity of place and people, of nature and society” (p. 34). As such, a foodshed is a conceptual framework to connect communities with the agricultural land base needed to produce food to support them, but given that food travels by boat, truck, and airplane, foodsheds are not strictly a natural resource definition in the same way as are watersheds. Still, taking poetic license, the term has

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<sup>1</sup> According to the EPA, a watershed is the “area of land where all of the water that is under it or drains off of it goes into the same place. . . . Watersheds come in all shapes and sizes. They cross county, state, and national boundaries” (<http://water.epa.gov/type/watersheds/whatis.cfm>). There are 2,267 watersheds in the United States.

**Table 1: Categories of Food System Assessments**

Note: This list is not necessarily exhaustive. Moreover, categories are not completely separable. Any given food assessment may include elements from one or more of these types.

Assessment Type	Purposes	Methodologies	Limitations	Selected Examples
<b>Local or Regional Foodshed Assessment</b>	Determine the existing or potential geographic boundaries of local food procurement; identify the land requirements for feeding a given population.	Geospatial analysis of soils data, land use characteristics, production levels and capacity, and consumption estimates.	<ul style="list-style-type: none"> <li>• “Foodshed” is more conceptual than actual.</li> <li>• Local consumption data is not readily available.</li> <li>• External forces beyond geographic boundaries often are not considered.</li> <li>• Key food system infrastructure often is not addressed.</li> </ul>	<ul style="list-style-type: none"> <li>• Testing a complete-diet model for estimating the land resource requirements of food consumption and agricultural carrying capacity: The New York State example. New York. (Peters et al., 2009)</li> <li>• Local foodshed mapping tool. New York. (Cornell University Cooperative Extension, 2010)</li> <li>• Think globally, eat locally: San Francisco foodshed assessment. California. (Thompson, Harper, &amp; Kraus, 2008)</li> <li>• Assessing the local food supply capacity of Detroit, MI. Michigan. (Colasanti &amp; Hamm, 2010)</li> </ul>
<b>Comprehensive Food System Assessment</b>	Analyze the systemic nature of a local, state, or regional food system, including the land requirements, production, processing, distribution, consumption, and disposal of waste. Addresses the interactions of food with social, environmental, and economic concerns.	Quantitative and qualitative, often including geospatial analysis of soils data, land use characteristics, food production and consumption, and related topics, such as historical trends and life cycle analysis of the food system. Qualitative analysis of stakeholder focus groups, surveys and interviews.	<ul style="list-style-type: none"> <li>• Conceptual and methodological approaches to “systemic” work are not always made explicit.</li> <li>• Holistic assessments are expensive, but it is misleading to address parts of the system and represent them as the whole.</li> <li>• Systems analysis may be viewed as too complex to be useful.</li> </ul>	<ul style="list-style-type: none"> <li>• Eating here: Greater Philadelphia’s food system plan. Pennsylvania. (DVRPC, 2011)</li> <li>• Food system assessment for Oakland: Towards a sustainable food plan. California. (Unger &amp; Wooten, 2006)</li> <li>• The new mainstream: A sustainable food agenda for California. California. (Brady, 2005)</li> <li>• Farm to plate initiative. Vermont. (Vermont Sustainable Jobs Fund, 2011)</li> <li>• Local Food Assessment and Plan. Ohio. (Mid-Ohio Regional Planning Commission, 2010)</li> <li>• Ohio’s food systems: Farms at the heart of it all. Ohio. (Meter, 2011b)</li> </ul>
<b>Community Food Security<sup>a</sup> Assessment</b>	Engage community members in assessing food system access and framing action initiatives. Improve low-income food access and participation; promote food security. Identify key system dynamics affecting low-income	Compile demographic data; prepare narratives, lists, or maps showing food access concerns of low-income residents; identify placement of groceries or farm stands; assess adequacy of food supply; identify logistical	<ul style="list-style-type: none"> <li>• It may be difficult to convince local decision makers that ensuring access to low-income consumers is an essential part of a food assessment.</li> <li>• Unless researchers are savvy about working with low-income constituencies, tensions may develop between residents and research staff.</li> </ul>	<ul style="list-style-type: none"> <li>• Making room at the table: A guide to community food security in Connecticut. Connecticut. (Connecticut Food Policy Council, 1998)</li> <li>• Bedford-Stuyvesant community food assessment. New York. (City Harvest, 2010)</li> <li>• Burlington community food assessment. Vermont. (Burlington Food Council, 2004)</li> <li>• From Our Own Soil: A Community Food Assessment, Benton County Oregon and its Foodshed. Oregon. (Ecumenical Ministries of</li> </ul>

Assessment Type	Purposes	Methodologies	Limitations	Selected Examples
	residents.	barriers that tend to exclude low-income residents; identify cultural traditions and concerns. Qualitative analysis of focus groups, surveys and interviews with food system stakeholders.	<ul style="list-style-type: none"> <li>If the assessment focuses too narrowly on low-income communities, it may miss potential external resources.</li> </ul>	<p>Oregon, 2006)</p> <ul style="list-style-type: none"> <li>La Plata County food assessment. Durango, Colo.: Growing Partners of Southwest Colorado. (Growing Partners of Southwest Colorado, Fitzgerald &amp; Pepinsky, 2007)</li> </ul>
<b>Community Food Asset Mapping</b>	Engage residents in informal mapping exercise to take asset-based approach to food-system visioning.	Participatory mapping or listing exercises to identify existing or potential community food assets.	<ul style="list-style-type: none"> <li>Informality may inhibit comprehensive evaluation or dissemination.</li> <li>Unless researchers are savvy in building capacity in low-income communities, tensions may develop between residents and professional staff.</li> </ul>	<ul style="list-style-type: none"> <li>Analyzing local food systems for success: Naming and graphing entrepreneurial and community based agriculture linkages. Iowa. (Smith, Huber, &amp; Russell, 2007)</li> </ul>
<b>Food Desert Assessment</b>	Identify locations in a given region where residents have limited access to supermarkets or other healthy food sources. Identify resident concerns about food access.	Geospatial analysis of food stores' proximity to residential neighborhoods; qualitative analysis of resident perceptions of access and health issues.	<ul style="list-style-type: none"> <li>The term "food desert" is often viewed as offensive to low-income communities.</li> <li>A focus on what a community lacks, rather than what resources it has, can have negative psychological impacts on the community.</li> <li>The concept of "food desert" focuses primarily on access to grocery stores, neglecting smaller food retailers and community food production.</li> </ul>	<ul style="list-style-type: none"> <li>Access to affordable and nutritious food – measuring and understanding food deserts and their consequences: Report to Congress. United States. (Ver Ploeg et al., 2009)</li> <li>Examining the impact of food deserts on public health in Chicago. Illinois. (Mari Gallagher Research &amp; Consulting Group, 2006)</li> </ul>
<b>Land Inventory Food Assessment</b>	Identify underutilized land suitable for agriculture and assess the extent to which a municipality or region can feed itself.	GIS mapping of underutilized land, soils data, water access, and collection of other information useful to urban agriculture.	<ul style="list-style-type: none"> <li>Assessments tend to rely on technology rather than engaging community residents and farmers in the study process.</li> <li>Other key elements of the region's food processing, storage, and distribution capacities generally are not included</li> </ul>	<ul style="list-style-type: none"> <li>Cultivating the commons: An assessment of the potential for urban agriculture on Oakland's public land. California. (McClintock &amp; Cooper, 2010)</li> <li>The diggable city: Making urban agriculture a planning priority. Oregon. (Balmer et al., 2006)</li> </ul>

Assessment Type	Purposes	Methodologies	Limitations	Selected Examples
<b>Local Food Economy Assessment</b>	Assess prevailing economic conditions in local farm and food systems. Make the case for community-based food commerce, jobs and wealth creation; unify local stakeholders around economic analysis of food system; help engage local officials in food planning.	Compile and analyze demographic and economic data, identify historical trends, identify current or potential business clusters, calculate economic multipliers.	<ul style="list-style-type: none"> <li>• Often overlook key elements of social and environmental sustainability.</li> <li>• Given global economic forces, it may be difficult for a localized view of economics to be persuasive.</li> <li>• Prevailing economic constructs may not effectively encompass local foods and economies.</li> </ul>	<ul style="list-style-type: none"> <li>• Finding food in farm country. Minnesota. (Meter &amp; Rosales, 2001) (Also 70 related studies in 30 states, <a href="http://www.crcworks.org/?submit=fffc">www.crcworks.org/?submit=fffc</a>)</li> <li>• The food system as an economic driver: Strategies and applications for Michigan. Michigan. (Conner, Knudson, Hamm, &amp; Peterson, 2008)</li> <li>• The 25% shift: The benefits of food localization for Northeast Ohio &amp; how to realize them. Ohio. (Masi, Schaller, &amp; Shuman, 2010)</li> <li>• Economic impact summaries for local food production. Iowa. (Swenson, 2007)</li> <li>• Ohio's food systems: farms at the heart of it all. Ohio. (Meter, 2011b)</li> </ul>
<b>Food Industry Assessment</b>	Identify key food industries in a region, perhaps assist investors in making investment decisions, or identify existing or potential industry clusters in food.	Compile quantitative data covering local food businesses or clusters of related firms.	<ul style="list-style-type: none"> <li>• May overlook key elements of social and environmental sustainability.</li> <li>• May be systematic in scope methodically, without paying close attention to system dynamics.</li> </ul>	<ul style="list-style-type: none"> <li>• Mapping the Minnesota food industry. Minnesota. (Meter, 2009)</li> <li>• The competitive advantage of the inner city. United States. (Porter, 1995)</li> <li>• Agricultural and food industry clusters in the Northeast US. United States. (Goetz, Shields, &amp; Wang, 2004)</li> <li>• Toronto's key industry clusters: Food &amp; beverage. Ontario. (Wolfson, 2010)</li> </ul>

Note. This table was created by Marisol Pierce-Quiñonez and Ken Meter. Select elements of this table were presented by Ken Meter as part of a webinar offered for the Centers for Disease Control (Meter, K. (2011). Using food system assessments with food policy councils. May 16. <http://www.crcworks.org/crcppts/KMcdc11.pdf>). All studies have full citations in the references section.

<sup>a</sup> The Community Food Security Coalition (CFSC) defines food security as “increasing access to food and the active participation of low-income residents in creating a more responsive food system.”

galvanized community desire to localize food supplies because it opens the door to the development of a modern food system that simultaneously supports local and regional agriculture and the dietary needs of people in nearby population centers. Chris Peters, originally of Cornell University, has led the academic work on foodshed assessments. Beginning with 2003 papers that explored the relationship between local agricultural production and nutrition (Peters, Bills, Wilkins, & Smith, 2003a, 2003b), Cornell researchers have published a series of foodshed studies that measure the land resource requirements of food production in New York. A 2007 paper tested a complete diet framework to understand how diet influences the demand for agricultural land (Peters, Wilkins, & Fick, 2007). In this paper, researchers called for a geospatial framework to improve understanding of the ability of a local region to supply more of its own food. This led to a paper on mapping potential foodsheds in New York that provides a template for considering the geography of food production and consumption simultaneously (Peters, Bills, Lembo, Wilkins, & Fick, 2009).

Most recently, Cornell released a Local Foodshed Mapping Tool that establishes the productive capacity of agricultural land by geospatially analyzing soils data, land use, and production averages from the U.S. Census of Agriculture (Cornell University Cooperative Extension, 2011). What began as Peters' master's thesis, aimed at linking food production and consumption, has evolved into a sophisticated web-based tool which is currently live for the state of New York, with plans to bring data for the rest of the country online by fall 2011.

The Local Foodshed Mapping Tool allows users to visualize the geographic area required to feed population centers within the state, based on the productive capacity of local farmland and optimization modeling techniques that minimize the number of food miles from production to consumption. The tool will be very useful to planners who want to assess the capacity of local agriculture to feed communities within its foodshed. However, unlike assessments that address the entire system, it does not take into consideration processing facili-

ties or distribution networks needed to turn the capacity into a practical reality. Another limitation of this approach is that many practitioners assume each parcel of land will support only a single commodity, when in fact many farmers rotate through a variety of crops and livestock, leaving land fallow as well.

In 2008, American Farmland Trust (AFT) released *Think Globally, Eat Locally: San Francisco Foodshed Assessment*, attempting to answer the question, "could the City of San Francisco feed itself with local food from farms and ranches within 100 miles [160 km] of the Golden Gate Bridge?" (Thompson, Harper, & Kraus, 2008, p. 1). Using a 100-mile radius as a proxy, the study examined to what extent people in the Bay Area could improve their well-being and reduce their global footprint by eating locally. The report documents both the answers that AFT found and the additional questions that arose because of the investigation.

The agricultural data available were ample for conducting an analysis. The study found that more than 80 different commodities were produced in the foodshed, only a handful of which lacked the abundance to satisfy the food requirements of the city and Bay Area. However, the assessment was limited by deficiencies in consumer data available to trace the flow of food from producer to consumer. It was not possible to determine accurately how much food grown within the foodshed actually was consumed in the city or how much of what was consumed in the city was produced by local farms and ranches. Beyond the fact that private enterprises withhold privileged information, decades of modernization to achieve convenience, consolidation and standardization has made it impossible to trace the what, when, where, who, and how of where our food comes from. Thus, among other recommendations, the report calls for expansion of local infrastructure to store, process, preserve, and transport local food, but does not propose the means by which to achieve this.

### **Land Inventory Food Assessment**

Land inventories are essentially a subset of foodshed assessments. They identify property charac-

teristics that may shape the future potential for food system creation, and are used particularly by people working to build urban or regional agricultural systems. The inventory process might include: (1) listing underutilized parcels of land, (2) identifying how much land would be needed to feed a given population, and/or (3) identifying lands in a region that are especially suited (or not) to producing food or supporting agriculture. Often the inventories are overlaid with maps showing characteristics such as soil quality, slope, and water access, to determine whether a given area is suitable for cultivation. Assessments then combine this supply-side data with consumption data to determine the potential contribution agriculture can make to the total food needs of a city or region. Land inventories do not necessarily address the political feasibility of converting all available land to agricultural use, nor do they address the additional infrastructure required by such a change to local land use.

A land inventory for the city of Oakland found that 5% to 10% of the city's food needs could come from within city boundaries (McClintock & Cooper, 2009), while a similar study in Toronto found that through community gardens, existing small farms, green roofs, and institutional lands, roughly 10% of Toronto's food needs could be met (MacRae et al., 2010). Like other foodshed models, these inventories do not take into account what it takes to connect the food that could be grown on this land to consumers. In addition, they do not address the limited number of people with sufficient access to capital and land, and who have the desire and drive to commercially produce and market farm products.

### **Comprehensive Food System Assessments**

Among the many tools people engaged in planning can use to promote sustainability is drawing upon environmental information to guide policy through the use of sustainability indicators. While few sets of sustainability indicators have made dramatic impacts on policy or governmental operations, municipalities such as the city of Santa Monica have begun to tie budget decisions to agency achievement of sustainability goals, and linked

indicators have helped show interconnections among systemic issues (Meter, 2004, 2007).<sup>2</sup> Another tool is to assess the environmental effects of policies through environmental impact assessments (Levett, 1997).

Food system assessments (FSAs) are a promising new combination of these and other assessment tools. Some FSAs are used to gather information, some are launched as part of a process of engaging citizens in visioning or planning processes, some are aimed at understanding prevailing economic conditions or food system dynamics, while others are used to measure the changes in various system parameters over time. FSAs are meant to operate through a systems framework in which individual disciplines are viewed as interconnected fields instead of separate domains. Research aims go beyond the productive capacity of a given region ultimately to address the entire life cycle of the food and farming system. Thus FSAs encompass the complex relationships within a food system, starting with stewardship of land and water resources and the cultivation of crops and livestock, moving through the supply chain<sup>3</sup> to the acquisition and consumption of food, and completing the cycle with the disposal and reuse of agricultural and food-product waste.

Food system assessments are more comprehensive in scope than foodshed assessments. Where foodshed assessments focus on the connection between the availability and capacity of agriculture and the land base to support food and dietary needs, food system assessments address more of the social and economic factors involved in getting food from farm to fork (Curtis, Creamer, & Thraves, 2010). They may also include close attention to environmental concerns, and the linkages among sustainability issues. Since the food system is more than just production outputs and consumption statistics, FSAs assess food access and often address the hardships associated with bringing food to marginalized communities. These assessments recognize

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<sup>2</sup> <http://www.smgov.net/departments/ose/>

<sup>3</sup> Sometimes referred to as "value networks." See Meter, K., *JAFSCD*, 2(1), "Breaking Our Chains."



that a food system will result in hunger unless it is just and equitable, and it includes policies that promote food access and distribution.

FSA's are also part of an emerging field focused on the evaluation of systems. Systemic evaluation involves looking at the "big picture," but also analyzing the interconnections between pieces of that picture (Williams & Imam, 2007). Food systems are complex adaptive systems. How researchers define the boundaries of a given system and investigate its relationship to other systems can markedly affect results. Meter (2007) discusses the use of several system frameworks in evaluating food systems, finding that, although complicated, systemic frameworks can provide valuable insights into the workings of food systems. Meter views food systems as "complex adaptive systems" (p. 153) in which the essential dynamics of the system change over time. As such, using specified quantitative indicators may be tricky; key indicators may wax and wane in importance over time. Thus, his research integrates time-series data and other quantitative measures with qualitative comments from "wise practitioners" with practical experience in the food system. Often these practitioners, being embedded in community contexts, hold deep insight about systems dynamics that are difficult for specialists to see on their own.

Often a FSA and a food system plan are released as a single document. Such is the case for the *Food System Assessment for Oakland: Towards a Sustainable Food Plan* (Unger & Wooten, 2006) and the *Assessment and Action Plan for Localization in Washtenaw County, Michigan* (Davis et al., 2004). Since food systems are not truly sustainable if they do not ensure food security, food access is a central point of focus for these reports, as with community food assessments. However, addressing the complexity of local/regional food systems is their chief purpose. Therefore, they typically recommend ways to improve every aspect of the system, including the production, processing, packing, distribution, acquisition, and disposal and reuse of food and food and agricultural waste.

The priorities embedded in sustainable local, state and regional food systems often conflict with one another, resulting in a complex web of food policy priorities. An FSA can help elucidate priorities, using existing data and stakeholder input as a guide. Input from the community at large is important, but not necessarily an intrinsic part of an FSA, as reports can be developed by mining the data collected by government institutions such as the USDA, the Bureau of Labor Statistics, and the U.S. Census, as well as local planning and health departments.

FSA's are conducted by local and regional governments, coalitions of food and farming organizations, food policy councils, consultants, and academics. Unlike CFAs, no standard toolkit has been developed to support them, so reports and outcomes are difficult to compare. Often this has led to an incomplete picture of the complexity of the overlapping issues that should be addressed. For instance, *A Healthy Seasonal Local Food System Plan* for Linn & Johnson Counties in Iowa prioritizes the economic viability of local farms, but does not address the environmental impacts of agriculture such as soil erosion and water pollution (Linn/Johnson Local Food Task Force, 2010).

Taking FSA's a step further toward planning, the Sacramento Area Council of Governments (SACOG) assessed the potential to develop regional food infrastructure for its six-county planning area, which includes the city of Sacramento and surrounding rural communities. Following the adoption of its *Blueprint 50-Year Smart Growth Land-Use Strategy*, SACOG initiated a Rural-Urban Connections Strategy (RUCS) to address agricultural conservation and infrastructure, among other issues. It used a web-based platform called I-PLACE3S, which supports scenario planning, to develop a sophisticated, data-driven tool to analyze a range of situations and test multiple variables and economic indicators (SACOG, 2009). One of the things this achieved was the ability to assess the relationship between market conditions, land use changes, and demand on resources such as water, labor, and transportation and infrastructure.

(National Association of Development Organizations Research Foundation, 2011)

At the end of the 2009 session, the Vermont legislature approved the Vermont Farm to Plate (F2P) Initiative. After extensive research, community outreach, and planning, in 2011 F2P released a 10-year strategic plan to strengthen the state's food system (Vermont Sustainable Jobs Fund, 2011). Led by the Vermont Sustainable Jobs Fund in consultation with the Sustainable Agriculture Council and other stakeholders, this soil-to-soil analysis is rich with data that starts with examining agricultural inputs, follows agricultural products through processing and market distribution, and ends with an analysis of what happens to these products when they are returned to the environment. F2P is one of the most comprehensive food system assessments in circulation.

The Vermont F2P Initiative is a good example of a food system assessment and a strategic plan that resulted from an extensive stakeholder process. The F2P explored current conditions, assessed barriers and gaps, identified emerging opportunities, and provided a series of objectives and strategies including a market-oriented Farm and Food Enterprise Development Framework. Addressing the question of whether Vermonters can feed themselves through local food production, as with foodshed assessments, the analysis concluded, "no comprehensive data exist to indicate exactly how much and what type of food — local or imported — is currently being consumed by Vermonters" (Vermont Sustainable Jobs Fund, 2011, p. 12).<sup>4</sup> However, the project has an entire section on goals, indicators, and measures to strengthen the state's agricultural sector and reconnect food production and consumption, not only among households but in schools and other institutions as well.

Of the various organizations that are responsible for FSAs, Regional Planning Organizations (RPOs) and Metropolitan Planning Organizations (MPOs) hold great promise for conducting assessments that

will lead to plans and policies strengthening local, state, and regional food systems, because planners are trained to take a systems approach to problem solving. Planners are familiar with many of the ideas associated with food system assessments, such as the needs of low-income residents, the primacy of sustainability, the community as a unit of analysis, and the interdisciplinary nature of the topic (Pothukuchi, 2004). The commonalities between food systems and the planning profession make planners well suited to prepare as well as to use FSAs.

The Delaware River Valley Planning Commission (DVRPC) is a case in point. Beginning in 2009, the Philadelphia-based MPO conducted a food system study specifically to lay groundwork for a food systems plan (DVRPC, 2011). Using planners' skills to bring multiple, diverse stakeholders together and with all assessment tools at their disposal, DVRPC developed baseline conditions for the region's foodshed as a precursor to developing its regional food system plan. It identified characteristics of the foodshed, used the USDA Census of Agriculture to examine agricultural conditions and the farmland base needed to sustain food and farming in the region, and mapped remaining agricultural soils.

Similar to the AFT foodshed study, DVRPC used a theoretical geographical area — a 100-mile (160-km) radius from Philadelphia — to designate the Greater Philadelphia regional foodshed. Using the foodprint methodology (Peters et al., 2009), DVRPC determined that Philadelphia's 5.5 million people needed 6.8 million acres of agricultural land to meet their annual nutritional needs. This would require 2.8 million more acres of land than is encompassed in its foodshed.

Further calculations comparing the total value of agricultural products sold in the region and the amount of food purchased in Greater Philadelphia illustrated the gap between production and consumption: a total of US\$6 billion of agricultural products were sold in 2007, including food, while consumers in Greater Philadelphia purchased US\$15 billion of food. While DVRPC found it

<sup>4</sup> A follow-up study has been commissioned to begin this measurement process.

difficult to trace the origin of most of the food consumed in the region, it was able to determine that the region consumes most of what it grows, estimating that 61% of all food freight shipments originating in the region were destined for purchase within the region.

Based on their FSA and the multiyear stakeholder-driven process, in February 2011 DVRPC released *Eating Here: Greater Philadelphia's Food System Plan*, one of the most comprehensive food system plans to date. *Eating Here* details more than 50 recommendations for strengthening the regional economy and agricultural sector, decreasing waste and want, enhancing public health, protecting soil and water, and encouraging diversity, innovation and collaboration. These recommendations can be measured using a set of 10 indicators.

As an example of another MPO, the Mid-Ohio Regional Planning Commission (MORPC) released the *Central Ohio Local Food Assessment and Plan* in 2010, which contains five goal categories: Increase the Supply of Local Food, Expand the Local Food Infrastructure, Improve the Viability of Farm and Food Businesses, Remove Barriers to a Local-Food System, and Increase Understanding of Local Food and its Benefits. These goals support 13 short-term recommendations and 11 long-term recommendations to “build a regional food system that can make farms more viable...promote healthful eating and living; strengthen rural and urban communities that grow and process food; and create a resilient network of farms and food-related businesses” (MORPC, 2010, p. 31). Based on the work of five task forces within their Agriculture and Food Systems Working Group, MORPC engaged 80 individuals, representing a variety of interests throughout the region's 12 counties, to guide and conduct the assessment.

Another assessment of Ohio's food systems (Meter, 2011b) found that US\$30 billion drains from Ohio food systems each year through three channels: (a) farmers gain only a small amount by producing commodities for export, yet (b) buy billions of dollars of essential inputs sourced outside the state, while (c) consumers eat food that

is grown outside Ohio (Meter, 2011b). The study argued that recapturing these dollars would create significant economic opportunities, and touched on a variety of related issues: from historical trends that have created an emphasis on export-based commercial infrastructure, to the vulnerability inherent in reliance on fossil fuels, to the medical costs of treating diabetes and related conditions. Further, it identified food-related firms that have been building clustered business relationships for more than 40 years and proposed public and private investment to strengthen this ongoing business development. The growth of these business networks over four decades was analyzed as a dynamic of systemic emergence.

### **Community Food Security Assessments**

A community food security assessment (CFSAs) is a community-based approach to measuring, envisioning, and/or creating a more secure and just food system. CFSAs are produced by community members, often but not always with the assistance of technical experts, and designed to address local conditions. Usually, because of the leadership of the Community Food Security Coalition (CFSC), which has emphasized food security, CFSAs have prioritized work in low-income neighborhoods. Some emphasize access to food, while others involve a more integrated picture of the food system that includes production, distribution, and recycling of food waste.

Hundreds of CFSAs have been conducted across the country. The CFSC toolkit uses a slightly different term, community food assessment (CFA), defining CFA as a “collaborative and participatory process that systematically examines a broad range of community food issues and assets, so as to inform change actions to make the community more food secure” (Pothukuchi, Joseph, Burton, & Fisher, 2002, p. 11).<sup>5</sup> CFSC notes that the goal of a CFA is often broader than measurement or practical recommendations; often, the focus is on

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<sup>5</sup> CFSC defines food security as increasing access to food and the active participation of low-income residents in creating a more responsive food system.

gathering data, civic engagement and coalition-building.

The Bedford-Stuyvesant community food assessment of New York City is an interesting example of a CFA. City Harvest conducted the assessment in collaboration with 17 local food and agriculture organizations, obtaining data from community members surveyed in several subway stations and churches in the Bedford-Stuyvesant neighborhood of Brooklyn (City Harvest, 2010). The assessment gathered information on the demographic makeup of the community and secondary data from a variety of food- and hunger-related studies conducted in the past. Primary research was conducted to assess current food needs. Interviews, surveys, and focus groups aimed at answering questions about food access, affordability, and quality, and subjects' personal eating habits. Additional information on the retail food environment was gathered by visiting grocery stores and conducting price comparisons and qualitative assessments of the freshness and appearance of food items. Six recommendations for community-based food policy changes were made.

### **Community Food Asset Mapping**

One relatively simple exercise that is used by citizen food planners and also by professional planners to convene a food planning process is to map local food system assets. Often a highly energizing step for a community to take, this can be effectively used to set a positive tone at the launch of a public process. Avoiding the negative implications of a "needs" assessment (which can spiral community members into inactivity), an "asset map" can bring people together more positively to discuss what their community already *has*, rather than what it *lacks*. Residents often build a strong spirit of collaboration by enjoying new discoveries and capacities together. Using imagery rather than words may enhance the participation of people who often feel marginalized by more formal processes. One hour-long session can at times launch several months' worth of activity, so this can be a deeply effective way to energize a civic planning process.

A food asset map can be done as an exercise of

drawing an informal map on butcher paper, or it can be performed using a sophisticated GIS platform. It can be as simple as making a word list of current or potential food system assets, or it can produce a well developed study document. Professionals and civic leaders can work on the map together, or low-income residents can collaborate to form a new appreciation of what their community already owns and what local practitioners have already accomplished. One author of this paper has used asset mapping to identify vacant buildings that were viewed as eyesores, but which became valued as potential locations for future food system activity. If led by a practitioner having a solid grasp of systemic work, residents will often identify essential system dynamics as they discuss what their work circle has placed on the map.

A pioneer in developing food asset mapping has been Carol Richardson Smith, who worked extensively with communities across Iowa in her former position with the National Catholic Rural Life Conference (Smith, Huber, & Russell, 2007). Asset-based planning processes have also been advanced by the Asset-Based Community Development practitioners at Northwestern University (Asset-Based Community Development Institute, 2009). Yet the very nature of this work — it is relatively easy to do spontaneously, and lends itself well to informal settings — limits the production of formal papers, or the scholarly treatment of this as a formal methodology. This approach may be one part of a CFSA process, but does not inherently engage low-income residents or treat food security concerns. Because of its focus on land and facilities, an asset-mapping exercise tends to move rapidly to coverage of distribution and other infrastructure; it also lends itself well to expanding into a discussion about existing or potential local food businesses, and may help to identify local business clusters. Asset-mapping can also be an excellent technique for drawing out resident wisdom in identifying patterns of emergence<sup>6</sup> in local food systems.

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<sup>6</sup> For a definition of patterns of emergence, see Williams & Imam (2007), pages 134–135.

## Food Desert Assessment

A “food desert” is defined as a geographical area that lacks adequate access to affordable and healthy food (Cummins & Macintyre, 2002). Defining access is a complicated task: it can mean anything from lack of healthy produce at local corner stores to the absence of full-service supermarkets within walking or driving distance from a population. The Mari Gallagher Research and Consulting firm produced several groundbreaking food desert assessments, defining a food desert as a “large geographic area with no or distant grocery stores” (Gallagher, 2006, p. 6). Food desert assessments have been valuable tools in calling attention to the lack of adequate access to healthy foods through graphical representation of the issue through maps. Although the term has evoked broad interest and is easy to comprehend, it has not always been welcomed by low-income residents themselves.

In 2009 the USDA released a report on U.S. food access, which mapped supermarkets and other large grocery stores and classified geographic areas as low-, medium-, or high-access areas (Ver Ploeg et al., 2009). In 2011 the data was brought online to create an interactive map in conjunction with the Let’s Move! Campaign (USDA, 2011). It is meant to be an informational tool and also as a guide for food retail development through the Healthy Food Finance Initiative (HFFI).

Food deserts have been associated primarily with low-income urban areas, but researchers have found that inadequate access exists in rural communities as well (Meter & Rosales, 2001). A meta-analysis of food access studies conducted by Policy Link and the Food Trust compiled a comprehensive bibliography from the past 20 years that profiled 132 studies: 61 published in peer-reviewed journals primarily conducted by university-based researchers, and 71 conducted and self-published by practitioners or policy researchers that were sometimes completed in collaboration with academic researchers (Treuhaft & Karpyn, 2010). It found that accessing healthy food is particularly challenging for “those living in low-income neighborhoods, communities of color, and rural areas” (p. 13). The report notes that the majority of

studies focus on urban areas, but 20 studies found significant food access issues in rural communities. The study concluded that rural areas can suffer from severe distances between retailers, and often see a decline in small food retailers due to the rise of supercenters.

Despite the widespread adoption of the term “food desert” and the local and federal programs based around various definitions, some communities reject the term. The term can be construed as overly negative in its focus on a quality that the neighborhood lacks rather than on its current or potential assets. Others take issue with the importance placed on supermarkets, and argue that smaller corner stores and bodegas should also be taken into consideration when qualifying food access. Still another critique is not about the term itself, but rather about the emphasis this conceptual approach places on food *consumption* rather than *production*. Many food security leaders insist it is more important to build resident capacity to produce and process foods for their own community, rather than simply ensuring grocery store access; in a rural context, this often suggests a goal of ensuring that farmers produce more foods that can support the family itself, or are sold directly to consumers, rather than through grocers.

## Local Food Economy Assessments

Other food assessments review the prevailing economic trends in food and agriculture with an eye toward strengthening the local economy by creating clusters of local foods businesses and supportive infrastructure. This analysis may be a stand-alone economic study, or an element of a broader CFA or food-system assessment. Local economic assessments often make the case that a food system that promotes the purchase of locally produced foods keeps more money within the local economy, thus creating a more prosperous locale or region.

A variety of economic assessments have been conducted across the country, in both urban and rural settings. Since money is the vehicle society uses to place value on competing uses of resources (for example, whether it is more valuable to compost

organic matter to build soil fertility, or to apply chemical fertilizers), economic analysis constantly crosses disciplinary lines. This makes economics a powerful lens for integrative work by planners. For example, a 2008 Michigan State University input-output analysis found that transitioning to a more local, sustainable food system in Michigan would create about 2,000 Michigan jobs and US\$200 million in new labor income (Conner, Knudson, Hamm, & Peterson, 2008).

Calculations of economic multipliers also play a key role in planning decisions, since investment choices often hinge on the extent to which jobs and labor income are anticipated from a proposed project or plan. For example, an Iowa economist found that a small restaurant that had committed itself to buying local foods generated a multiplier of 1.9 in an eight-county area, as compared to a value of 1.5 for an average restaurant in the region (Swenson, 2007). Another study found that a rural economy in western Wisconsin, based on small farms, generated an overall output multiplier of between 2.2 and 2.6 (Swain, 1999; L. B. Swain, personal interview, February 12, 2001; Swain & Kabes, 1998).

Essentially, economic multipliers measure how a specific business or sector interacts with the prevailing infrastructure (Meter, 2010). Often the net impact of local food investments is relatively small compared to the prevailing economy, so the most successful practitioners insert new functions into the software to ask questions that have meaningful answers. As one example, since the amount of food traded in one Iowa region was too small to show a marked difference in IMPLAN,<sup>7</sup> researchers calculated the difference in multipliers for two restaurants, one of which purchased foods locally (Swenson, 2007). Higher multipliers are also, in general, a sign of stronger social connectivity, i.e., social capital. When interpreting a multiplier study, it is important to ask whether the definition of “local” used is simply taken to mean *purchased*

locally, or rather *sourced* locally. The latter test yields lower, but more realistic, multipliers.

### Food Industry Assessments

Many food analysts limit themselves to an overview of business activity, viewing it as separable from social and environmental concerns. A classic example would be the precise analysis of business dynamics that a stock analyst or financial reporter might produce that illuminates the profitability of an industry or highlights investment trends. Many industry assessments are effective analyses of food systems, but because they often are performed with the assumption that the financial system is the only system worth covering, they are often less comprehensive than other assessment tools. They also tend to be more static in their nature, viewing the financial sector more as a financial mechanism with changes only within predictable realms, and less as a complex adaptive system.

Still, industry assessments can be valuable to both citizen and professional food planners. The Toronto study listed in table 1, for example, highlights food industry clusters in that region. The study could certainly form the basis of concerted planning to strengthen this sector; or work such as this could be expanded into a more complete view of multiple food systems in the region.

Michael Porter’s work (1995) has highlighted his contention that inner-city grocery stores often are among the most profitable markets in the United States. This seems to occur primarily when groceries are located at the boundary between lower-income and upper-income neighborhoods, and the stores become cultural meeting grounds where consumers of all strata feel comfortable shopping. This is of clear importance to food-system and land-use planning efforts.

*Mapping the Minnesota Food Industry* (Meter, 2009) is a hybrid: a food industry assessment that is also one of the first efforts to consciously develop a systemic framework for analysis of the food industry. This study also considers the state food system to be a complex adaptive system. The title was specified by the contractor that commissioned

<sup>7</sup> IMPLAN is software system for local-level economic impact analysis. See more at <http://implan.com/V4/Index.php>

the study in advance of the writing, but the work also focuses on emergent qualities of the food system, and offers 10 “system levers” that the author claims drive change in Minnesota food systems toward a new paradigm (p. 64). It pays brief attention to food security issues and the health costs of faulty eating. Its analysis combines time-series data with in-depth interviews with “wise practitioners” who have practical experience in the emergent food system (p. 47).

### **Applicability of Assessments/Analyses**

The purpose of planning is to analyze, guide, and manage change at the community, city, and regional levels. Professional planning is a practice to create fully accessible communities that are healthy, safe places to live and work; promote social, economic, and racial equity; provide jobs close to home, quality education, affordable housing, transportation choices, recreational and cultural opportunities; promote sustainable natural resource management and protection from environmental hazards<sup>8</sup>; and, increasingly, to ensure access to healthy and affordable food.

Food system planning is emerging as a discipline for planning professionals as well as nonprofit and community organizations. In some cases, food system elements are included in traditional comprehensive plans. Marin County’s countywide plan, for example, outlines steps for building a sustainable food system by protecting farmland, encouraging production of local fruits and vegetables, and promoting healthy eating — and in turn markets for local produce (Marin County Community Development Agency, 2007, pp. 4–5). In other cases, planners can play an important role in building sustainable food systems because their job is to enhance the dynamic relationships between the social, ecological, and economic health of communities. Their interdisciplinary training and cross-sectoral work responsibilities are well suited to the task. Young planners in particular — both recent graduates and those currently in school — are learning about food systems while they develop

traditional planning skills. As they move into the workforce, they will become leaders in food system planning practice.

To succeed, however, residents, businesses, planners, and food system professionals need reliable assessment tools, which are still in the early stage of development. These tools will help them bring together the diverse interests in the food system to address the complex issues of creating the connectivity and resiliency needed to ensure sustainability across the food system spectrum. This includes the need to address the environmental problems of the food system more coherently, which could be achieved by incorporating data collected in foodshed analyses.

Environmental analysis would add considerably to understanding the food system. For instance, carbon emissions and food transport were often cited in the studies as environmental impacts of the food system, but are difficult to quantify without an accurate picture of where and how food is being grown and through which channels it is transported to market.

Certainly, all food system assessments draw upon reliable public data sources; it may be possible to devise standard approaches, which help to direct the design and collection of local data. This also could relieve much of the burden of data collection, enabling more time for data analysis and recommendations. Yet each community also has unique challenges and conditions, and adaptive food systems experience emergent change; standardization can only be the beginning of investigation into a community’s food system.

Finally, while it is clear that planners have an emerging role to play, there also is a need for them to coordinate and collaborate with people who have experience in sustainable agriculture as well as community food system stakeholders. The vision of the MORPC local food assessment and plan was to make fresh, safe, healthy, and affordable local foods easily and equally accessible in Central Ohio and distributed through a system that promotes sustainable farming practices and resilience in the

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<sup>8</sup> American Planning Association,  
<http://www.planning.org/apaataglanance/mission.htm>

region. To achieve this, the MORPC convened a multicounty agriculture and food systems working group that included professionals spanning the entirety of the food system and that examined production, processing, distribution, and consumption of food throughout the region. The Vermont Sustainable Jobs Fund engaged a broad group to develop the F2P plan, and the diverse DVRPC stakeholder committee included farmers and antihunger groups and engaged organizations as diverse as land trusts and the Food Trust, Farm Credit, and private foundations, as well as economic development councils. Likewise, sustainable agriculture advocates should seek out opportunities to work with planners and take advantage of the systems-based skill set and tools they have at their disposal.

These nascent efforts lay the groundwork for robust food system planning efforts in the years to come. To be most useful to planners and policy makers, it will be important to fully develop comprehensive assessments that include data and recommendations pertaining to farmland protection and the stewardship of natural resources, through the supply chain between production and consumption, ensuring healthy food access to all citizens, and ending with the proper reuse (composting) or disposal of food and agricultural waste. The combination of new assessment tools and broad community engagement inform an exciting new direction for food system planning practice.

### **Limitations of Assessments**

The most conspicuous limitation of the entire body of food system assessments is that they tend to focus on fresh produce rather than all the foods that make up the U.S. diet. Few refer to the meat and dairy industries, or to wheat, corn, and other commodities. This is a significant problem, as meat, poultry, eggs and dairy compose a considerable portion of the U.S. diet, and much of the U.S. agricultural economy produces feed crops such as corn and soybeans. Beyond their importance to the U.S. diet, livestock operations can be a major contributor to both water pollution and climate change (Steinfeld, Gerber, Wassenaar, Cassel, Mauricio, & de Haan, 2006, p. 85). Food

system assessments should address the complexities inherent in creating more sustainable food systems and pay more attention to environmental and public health issues.

Overall, many studies focus primarily on access to food and some simply on the agricultural land base needed to support food production, with very few that embrace the whole system, including the supply chain that connects them. The AFT San Francisco study is one exception, although researchers were unable to accurately trace food from farm to plate. Food procurement at the wholesale and retail level is a closely guarded secret, making it nearly impossible to know exactly from where an item actually comes. Meter's food system studies also cover the entire supply web (Meter 2009, 2011b). The U.S. Department of Transportation's Freight Analysis Framework is a good approximation of the transport of food through regions, but reveals little about where foodstuffs ultimately end up (U.S. Department of Transportation, 2011). The DVRPC included this information in its assessment; another that has done so is the International Society for Ecology and Culture (Mamen, Gorelick, Norberg-Hodge, & Deumling, 2004).

The research and reporting costs tend to be too high for comprehensive assessments. Food system professionals may not use assessment tools or may shun food system planning as an unnecessary step in creating on-the-ground projects. Food systems are not uniform from one jurisdiction to the next, so assessments must be tailored to their individual needs.

Foodshed assessments have other limitations. The foodshed concept is more a metaphor than an actuality, and the geographic region needed to supply a population center often will not fit neatly into jurisdictional interests or analyses. Most foodshed assessment focuses solely on farmland capacity and production, and so may overlook key elements of the region's food processing, storage, and distribution capacities, or social concerns. This is especially true of land inventory assessments, which generally



overlook key elements of the region's food processing, storage, and distribution capacities.

Furthermore, it may be difficult to fund a truly comprehensive food system assessment, as it requires significant time and resources to conduct a holistic examination of a multifaceted system. While professional planners have an established framework for systems analysis, only recently has the framework been applied to food. Given that many actors engage in food systems assessments, it is important to define conceptual and methodological approaches to "systemic" work, which are not always made explicit. Given the expense and complexity of these assessments, there is a danger of underrepresenting key elements of the food system, whether natural resource management, community economic development, food access or disposal of food and farm-related waste, while representing the system as a whole. Despite their limitations, assessments are useful if they are region-specific and lay a blueprint that can continue to be evaluated as the political landscape changes and the food system progresses.

Scores of community food coalitions across the United States are aware that the marketing channels that link producers and consumers are important and that it is critical to create infrastructure that makes local food trade more efficient, but most coalitions lack resources to make this happen. Several assessments in this study identified the need for a community kitchen to support value-added food enterprises, or a food hub to aggregate and process food in a centralized location. Those studies that cover economic issues most often address these sectors.

It can be difficult to convince local decision-makers that ensuring access for low-income consumers is an essential part of a food system assessment. Unless researchers are savvy about building capacity in low-income communities, tensions may develop between residents and professional staff. On the other hand, if the assessment focuses too narrowly on low-income communities, it may miss potential resources that are viewed as external, but which could play a

positive role. Focusing on what a community *lacks*, rather than what resources it *has*, can have negative psychological impacts, making it harder to actually solve the problems identified by the assessment. Finally, the concept of "food deserts" as used to date focuses primarily on access to grocery stores and supermarkets, neglecting other ways that low-income people may gain access to food, including producing their own.

As with the other types of assessments, those that focus on the local food economy or food industries may be too narrowly focused on economics, thus overlooking key elements of social and environmental sustainability. These assessments tend to take land use economics for granted without addressing key issues of land availability and price. Also, they share the limitations inherent in foodshed assessments because proprietary data is not available to accurately trace the flow of food from the farm to the consumer. Finally, these studies may be *systematic* in scope (methodical) without being *systemic* (paying close attention to system dynamics, including complexity).

### **Further Research**

Over the years progressive researchers have employed various assessment tools to gain a better understanding of food systems (Feenstra & Campbell, 1998; Gable, 1981). One remaining gap is access to reliable local food consumption data. Further research is needed to both identify and share improved measurement data about what people in specific places really eat, where their food actually comes from, and how it travels through the food system to get to them.


Community food security and local food economy assessments are the most established assessment tools, but recently foodshed and comprehensive food system assessments in particular have attracted significant interest. Our understanding of these, or any food system assessment, would be greatly enhanced through formal professional evaluation or academic review. Evaluating their approaches to stakeholder involvement would be especially useful.

Assessments that apply to a community context would benefit from evaluation of the extent and efficacy of community engagement, the assessment's ability to unify stakeholders regarding a common agenda, and the impacts of the related food system work on the community defined. It would also be interesting to know whether comprehensive assessments, which are less rooted in individual communities, effectively address stakeholder engagement and how consistently they address land use, economic, and environmental impacts, not only of existing food systems, but also of the ones they seek to create. Such evaluations could help illuminate whether the choice of differing scopes or methodologies leads to different visions of local or regional food systems, or, more importantly, leads to comprehensive food system plans that could be implemented through better policies — not only at the local level, but state and federal policies, as well.

The strengths of comprehensive food system and community food security assessments lie partially in their ability to incorporate many voices into one vision for the future and to unify stakeholders behind that vision. Other assessments may equally serve these purposes if performed properly. The field would benefit from detached research investigating the extent to which those voices are truly representative of the community and its needs, and how researchers overcame challenges in achieving full community engagement. Moreover, a test for bias should be applied to quantitative assessments that do not engage community members. Does an alleged “neutral” analysis actually take the side of one group of stakeholders relative to another? What impacts do community residents experience when their concerns are not addressed in a formal food assessment? Such questions clearly lend themselves to formal professional evaluation or scholarly research.

As noted earlier, a major limitation of all of these studies is the absence of an environmental analysis in the assessments. It would be valuable to research the attitudes of those behind these studies, to determine why environmental concerns tend to be left out of their investigations. Research on the

environmental impacts and externalities of the food system, along with recommendations about how to address these in existing food system assessment tools, would enhance food system planning practice and ensure that it addresses the entire system — not just in ensuring a land base for future food production, but evaluating the complete life cycle of the food system and its impacts on soil and water quality, its carbon footprint, the disposal of food and agricultural waste, and so on.

Overall, these studies attempt to achieve similar goals — the promotion of local, regional and/or sustainable food systems — but use different methods to produce their results. Follow-up evaluations should be conducted to determine the extent to which these assessment tools inform truly comprehensive food system plans, and whether those plans foster real policy achievements, and/or community and programmatic change. 

## References

- American Planning Association. (2007). *Policy guide on community and regional food planning*. Washington, D.C.: Author. Available from <http://www.planning.org/policy/guides/adopted/food.htm>
- Asset-Based Community Development Institute. (2009). Evanston, Illinois: ABCD, School of Education and Social Policy, Northwestern University. <http://www.abcdinstitute.org/>
- Balmer, K., Gill, J., Kaplinger, H., Miller, J., Peterson, M.,...& Wall, T. (2006). *The diggable city: Making urban agriculture a planning priority*. Portland, Oregon: The Diggable City Project Team/Nohad A. Toulan School of Urban Studies and Planning, Portland State University. [http://www.diggablecity.org/dcp\\_finalreport\\_PSU.pdf](http://www.diggablecity.org/dcp_finalreport_PSU.pdf)
- Benson, J. F. (2003). Round table: What is the alternative? Impact assessment tools and sustainable planning. *Impact Assessment and Project Appraisal*, 21(4), 261–280.
- Brady, E. (2005). *The new mainstream: A sustainable food agenda for California for review by the Roots of Change Council and the Roots of Change Fund*. Sacramento, California: The Vivid Picture Project/ Ecotrust. [http://www.vividpicture.net/documents/The\\_New\\_Mainstream.pdf](http://www.vividpicture.net/documents/The_New_Mainstream.pdf)

- Burlington Food Council. (2004). *Burlington community food assessment: An effort to improve nutrition for school-aged children and develop a more sustainable food system*. Burlington, Vermont: Author.  
[http://www.foodsecurity.org/cfa\\_outsideca.html#vermont](http://www.foodsecurity.org/cfa_outsideca.html#vermont)
- City Harvest. (2010). *Bedford-Stuyvesant community food assessment*. New York, New York: Author.  
<http://www.hungercenter.org/wp-content/uploads/2011/06/Community-Food-Assessment-Bed-Stuy-Zahilay.pdf>
- Clapp, J., Stringer, S. M., & Manhattan (New York, N.Y.). (2010). *FoodNYC: A blueprint for a sustainable food system*. New York, New York: Manhattan Borough President's Office.
- Colasanti, K. J. A., & Hamm, M. W. (2010). Assessing the local food supply capacity of Detroit, Michigan. *Journal of Agriculture, Food Systems, and Community Development*, 1(2), 41–58.  
<http://dx.doi.org/10.5304/jafscd.2010.012.002>
- Connecticut Food Policy Council. (1998). *Making room at the table: A guide to community food security in Connecticut*. Hartford, Connecticut: CFPC.
- Conner, D. S., Knudson, W. A., Hamm, M. W., & Peterson, H. C. (2008). The food system as an economic driver: Strategies and applications for Michigan. *Journal of Hunger & Environmental Nutrition*, 3(4), 371–383.  
<http://dx.doi.org/10.1080/19320240802528849>
- Cornell University Cooperative Extension. (2010). *Local foodshed mapping tool for New York State*. Ithaca, New York: Cornell University Department of Crop and Soil Sciences. <http://www.cals.cornell.edu/cals/css/extension/foodshed-mapping.cfm>
- Cummins, S., & Macintyre, S. (2002). “Food deserts”: Evidence and assumption in health policy making. *British Medical Journal*, 325, 436–438.  
<http://dx.doi.org/10.1136/bmj.325.7361.436>
- Curtis, J., Creamer, N., & Thraves, T. E. (2010). *From farm to fork: A guide to building North Carolina's sustainable local food economy*. Raleigh, North Carolina: Center for Environmental Farming Systems.
- Davis, G., DiRamio, M., Ellis, E. M., Horigome, K., Katz, L. A., & Martin-Schwarze, A. (2004). *Toward a sustainable food system: Assessment and action plan for localization in Washtenaw County, Michigan* (Unpublished master's thesis, University of Michigan).  
<http://www.mendeley.com/research/toward-sustainable-food-system-assessment-action-plan-localization-washtenaw-county-michigan/>
- Delaware Valley Regional Planning Commission (DVRP). (2011). *Eating here: Greater Philadelphia's Food System Plan*. Philadelphia, Pennsylvania: Author. <http://www.dvrpc.org/reports/10063.pdf>
- Ecumenical Ministries of Oregon. (2006). *From our own soil: A community food assessment, Benton County, Oregon, and its foodshed*. Available at <http://www.emoregon.org/pdfs/IFFP/CorvallisFoodAssessmentReport-logo.pdf>
- Feenstra, G., & Campbell, D. (1998). *Community food systems bibliography*. Updated: February 2000. Davis, California: UC SAREP.  
<http://www.sarep.ucdavis.edu/cdpp/cfsbib.htm>
- Gable, M. (1981). *Empty breadbasket? The coming challenge to America's food supply and what we can do about it*. Kutztown, Pennsylvania: Rodale Press.
- Goetz, S. J., Shields, M., & Wang, Q. (2004). *Agricultural and food industry clusters in the Northeast U.S.: Technical report*. Rural development paper no. 26. University Park, Pennsylvania: Northeast Regional Center for Rural Development. <http://nercrd.psu.edu/publications/rdppapers/rdp26.pdf>
- Growing Partners of Southwest Colorado, Fitzgerald, S., & Pepinsky, K. (2007). *La Plata County food assessment*. Durango, Colorado: Author.
- Guthman, J., Morris, A. W., & Allen, P. (2006). Squaring farm security and food security in two types of alternative food institutions. *Rural Sociology*, 71(4), 662–684.  
<http://dx.doi.org/10.1526/003601106781262034>
- Kloppenborg, J., Hendrickson, J., & Stevenson, G. W. (1996). Coming in to the foodshed. *Agriculture and Human Values*, 13(3), 33–42.  
<http://dx.doi.org/10.1007/BF01538225>
- Levett, R. (1997). Tools, techniques and processes for municipal environmental management. *Local Environment*, 2(2), 189–202.  
<http://dx.doi.org/10.1080/13549839708725524>
- Linn/Johnson Local Food Task Force. (2010). *A healthy seasonal local food plan for the Iowa Corridor Food & Agriculture Coalition: Developing strategic partnerships to revitalize a local food system within the Iowa Corridor Region*. Amana, Iowa: Linn/Johnson Local Food Task Force. [http://www.iacorridor-localfood.org/Projects/Final%20Strategic%20Plan\\_final.pdf](http://www.iacorridor-localfood.org/Projects/Final%20Strategic%20Plan_final.pdf)

- MacRae, R., Gallant, E., Patel, S., Michalak, M., Bunch, M., & Schaffner, S. (2010). Could Toronto provide 10% of its fresh vegetable requirements from within its own boundaries? Matching consumption requirements with growing spaces. *Journal of Agriculture, Food Systems, and Community Development*, 1(2), 105–127.  
<http://dx.doi.org/10.5304/jafscd.2010.012.008>
- Mamen, K., Gorelick, S., Norberg-Hodge, H., & Deumling, D. (2004). *Ripe for change: Rethinking California's food economy*. Berkeley, California: International Society for Ecology and Culture.  
<http://www.localfutures.org/images/stories/pdf/ripeforchange.pdf>
- Mari Gallagher Research & Consulting Group. (2006). *Examining the impact of food deserts on public health in Chicago*. Chicago, Illinois: Author.  
[http://www.marigallagher.com/site\\_media/dynamic/project\\_files/1\\_ChicagoFoodDesertReport-Full.pdf](http://www.marigallagher.com/site_media/dynamic/project_files/1_ChicagoFoodDesertReport-Full.pdf)
- Marin County Community Development Agency. (2007). *Marin countywide plan*. San Rafael, California: Author.  
[http://co.marin.ca.us/depts/CD/main/fm/cwpdocs/CWP\\_CD2.pdf](http://co.marin.ca.us/depts/CD/main/fm/cwpdocs/CWP_CD2.pdf)
- Masi, B., Schaller, L., & Shuman, M. H. (2010). The 25% shift: The benefits of food localization for Northeast Ohio & how to realize them. Cleveland, Ohio: The Cleveland Foundation/The Northeast Ohio (NEO) Food Web.  
<http://www.neofoodweb.org/sites/default/files/resources/the25shift-foodlocalizationintheNEOregion.pdf>
- McClintock, N., & Cooper, J. (2010). *Cultivating the commons: An assessment of the potential for urban agriculture on Oakland's public land*. Berkeley, California: City Slicker Farms, HOPE Collaborative, Institute for Food & Development Policy (Food First).  
[http://www.urbanfood.org/docs/Cultivating\\_the\\_Commons2010.pdf](http://www.urbanfood.org/docs/Cultivating_the_Commons2010.pdf)
- Meter, K. (2004). *Fifty-year vision and indicators for a sustainable Minneapolis*: Minneapolis sustainability roundtable. Minneapolis, Minnesota: Crossroads Resource Center.  
<http://www.crcworks.org/indicators.pdf>
- Meter, K. (2006). Evaluating farm and food Systems in the US. In Williams, B., & Imam, I. (Eds.), *Systems concepts in evaluation: an expert anthology* (pp. 141–159). Inverness, California: Edgepress.
- Meter, K. (2007). Linked indicators of sustainability build bridges of trust. In C. A. Maida (Ed.), *Sustainability and Communities of Place (Volume 5, Studies in environmental anthropology and ethnobiology)* (pp. 183–200). Oxford, UK: Berghahn Books.
- Meter, K. (2009). *Mapping the Minnesota food industry*. For Blue Cross and Blue Shield Minnesota Center for Prevention. Minneapolis, Minnesota: Crossroads Resource Center.  
<http://www.crcworks.org/crcdocs/mnfood.pdf>
- Meter, K. (2010). Metrics from the field: Learning how to multiply. *Journal of Agriculture, Food Systems, and Community Development*, 1(2), 9–12.  
<http://dx.doi.org/10.5304/jafscd.2010.012.014>
- Meter, K. (2011a). Metrics from the field: Breaking our chains. *Journal of Agriculture, Food Systems, and Community Development*, 1(4), 23–25.  
<http://dx.doi.org/10.5304/jafscd.2011.014.008>
- Meter, K. (2011b). *Ohio's food systems: farms at the heart of it all*. For University of Toledo Urban Affairs Center. Minneapolis, Minnesota: Crossroads Resource Center.  
<http://www.crcworks.org/ohfood.pdf>
- Meter, K., & Rosales, J. (2001). *Finding food in farm country: The economics of food and farming in Southeast Minnesota*. Lanesboro, Minnesota: Hiawatha's Pantry Project of the Community Design Center, Experiment in Rural Cooperation, Crossroads Resource Center.  
<http://www.crcworks.org/ff.pdf>
- Mid-Ohio Regional Planning Commission, Agriculture and Food Systems Working Group. (2010). *Central Ohio local food assessment and plan*. Columbus, Ohio: MORPC/The Columbus Foundation.  
<http://www.morpc.org/pdf/CentralOhioLocalFoodAssessmentAndPlan2010.pdf>
- Nagarajan, V., & Okot-Uma, R. W. O. (1999). *Environmental assessment of development projects: A guide for planners and managers*. London, UK: Commonwealth Secretariat.
- National Association of Development Organizations Research Foundation. (2011). *Regional food systems infrastructure*. Washington, D.C.: Author.  
<http://www.nado.org/regional-food-systems-infrastructure/>
- Percy-Smith, J. (1996). Introduction: Assessing needs. Theory and Practice. In J. Percy-Smith (Ed.), *Needs assessment in public policy* (pp. 3–10). Buckingham, UK: Open University Press.

- Peters, C. J., Bills, N. L., Lembo, A. J., Wilkins, J. L., & Fick, G. W. (2009). Mapping potential foodsheds in New York State: A spatial model for evaluating the capacity to localize food production. *Renewable Agriculture and Food Systems*, 24(1), 72–84.  
<http://dx.doi.org/10.1017/S1742170508002457>
- Peters, C. J., Bills, N., Wilkins, J. L., & Smith, R. D. (2003a, February). Vegetable consumption, dietary guidelines, and agricultural production in New York State: Implications for local food economies. *Smart Marketing*. Ithaca, New York: Cornell University.  
<http://hortmgt.dyson.cornell.edu/pdf/smartmarketing/peters2-03.pdf>
- Peters, C. J., Bills, N., Wilkins, J. L., & Smith, R. D. (2003b, September). Fruit consumption, dietary guidelines, and agricultural production in New York State: Implications for local food economies. *Smart Marketing*. Ithaca, New York: Cornell University.  
<http://hortmgt.dyson.cornell.edu/pdf/smartmarketing/peters9-03.pdf>
- Peters, C. J., Wilkins, J. L., & Fick, G. L. (2007). Testing a complete-diet model for estimating the land resource requirements of food consumption and agricultural carrying capacity: The New York State example. *Renewable Agriculture and Food Systems*, 22(2), 145–153.  
<http://dx.doi.org/10.1017/S1742170507001767>
- Pirog, R., Zdorkowski, G., Enshayan, K., Pardee, C., Meter, K., Beidler, K.,...Hug, A. (2006, August). *Developing a vibrant and sustainable regional food system: Suggestions for community-based groups*. Aldo Leopold Center for Sustainable Agriculture, Regional Food System Working Group, Iowa State University. Available at <http://www.leopold.iastate.edu/pubs-and-papers/2006-08-developing-vibrant-and-sustainable-regional-food-system>
- Porter, M. E. (1995). The competitive advantage of the inner city. *Harvard Business Review* (May/June), 55+. [http://www.uc.edu/cdc/Urban\\_database/food\\_resources/competitive-advantage-of-inner-city.pdf](http://www.uc.edu/cdc/Urban_database/food_resources/competitive-advantage-of-inner-city.pdf)
- Pothukuchi, K. (2004). Community food assessment: A first step in planning for community food security. *Journal of Planning Education and Research*, 23(4), 356–377.  
<http://dx.doi.org/10.1177/0739456X04264908>
- Pothukuchi, K., & Kaufman, J. L. (2000). The food system: A stranger to the planning field. *Journal of the American Planning Association*, 66(2) 113–24.  
<http://dx.doi.org/10.1080/01944360008976093>
- Pothukuchi, K., Joseph, H., Burton, H., & Fisher, A. (2002). *What's cooking in your food system? A guide to community food assessment*. Venice, California: Community Food Security Coalition.  
<http://www.foodsecurity.org/CFAGuide-whatscookin.pdf>
- Sacramento Area Council of Governments. (2009). SACOG I-PLACE3S program. Sacramento, California: SACOG. [http://www.sacog.org/projects/attachments/modeling-tools/Lizon\\_PC%20Present\\_IPLACE3S.pdf](http://www.sacog.org/projects/attachments/modeling-tools/Lizon_PC%20Present_IPLACE3S.pdf)
- Second Harvest Food Bank. (2009). *From the bayou to the boucherie: A food system assessment of South Louisiana*. New Orleans, Louisiana: Author.  
[http://repscottsimon.com/yahoo\\_site\\_admin/assets/docs/A\\_Food\\_System\\_Assessment\\_of\\_South\\_LA\\_Introduction\\_and\\_Chapters.1.33131214.pdf](http://repscottsimon.com/yahoo_site_admin/assets/docs/A_Food_System_Assessment_of_South_LA_Introduction_and_Chapters.1.33131214.pdf)
- Slotterback, C. S., Forsyth, A., Krizek, K. J., Johnson, A., & Pennucci, A. (2011). Testing three health impact assessment tools in planning: A process evaluation. *Environmental Impact Assessment Review*, 31(2), 144–153.  
<http://dx.doi.org/10.1016/j.eiar.2010.01.005>
- Smith, C. R., Huber, P., & Russell, M. (2007). *Analyzing local food systems for success: Naming and graphing entrepreneurial and community based agriculture linkages*. Des Moines, Iowa: Leopold Center for Sustainable Agriculture. <http://www.leopold.iastate.edu/sites/default/files/grants/2004-M04.pdf>
- Steinfeld, H., Gerber, P., Wassenaar, T., Cassel, V., Mauricio, R., & de Haan, C. (2006). *Livestock's long shadow: Environmental issues and options*. Rome, IT: Food and Agriculture Organization of the United Nations. <ftp://ftp.fao.org/docrep/fao/010/a0701e/a0701e00.pdf>
- Swenson, D. (2007). *Economic impact summaries for local food production*. Ames, Iowa: Iowa State University.
- Swain, L. B. (1999). *A study of the economic contribution of small farms to communities — completed 1996 to 1999*. Unpublished manuscript, Rural Development Institute, University of Wisconsin–River Falls.
- Swain, L. B., & Kabes, D. (1998). *1996 community supported agriculture report*. Unpublished manuscript, Rural Development Institute, University of Wisconsin–River Falls.

- Tchumtchoua, S., & Lopez, R. A. (2005). A town-level assessment of community food security in Connecticut. Storrs, Connecticut: University of Connecticut, Food Marketing Policy Center. *Research Monographs*. No. 1. [http://digitalcommons.uconn.edu/fpmc\\_mono/1](http://digitalcommons.uconn.edu/fpmc_mono/1)
- Thompson, E., Harper, A. M., & Kraus, S. (2008). Think globally, eat locally: San Francisco foodshed assessment. Washington, D.C.: American Farmland Trust. <http://www.farmlandinfo.org/documents/37187/ThinkGloballyEatLocally-FinalReport8-23-08.pdf>
- Treuhaf, S., & Karpyn, A. (2010). *The grocery gap: Who has access to healthy food and why it matters*. Oakland, California, & Philadelphia, Pennsylvania: PolicyLink/The Food Trust. <http://www.policylink.org/atf/cf/%7B97C6D565-BB43-406D-A6D5-ECA3BBF35AF0%7D/FINALGroceryGap.pdf>
- Unger, S., & Wooten, H. (2006). *A food systems assessment for Oakland, CA: Toward a sustainable food plan*. Oakland, California: Mayor's Office of Sustainability. [http://oaklandfoodsystem.pbworks.com/f/OFSA\\_TOC\\_ExecSumm.pdf](http://oaklandfoodsystem.pbworks.com/f/OFSA_TOC_ExecSumm.pdf)
- United States Department of Agriculture. (2011). *Food desert locator*. Washington, D.C.: USDA, Economic Research Service. <http://www.ers.usda.gov/data/fooddesert/index.htm>
- United States Department of Transportation. (2011). *Freight Analysis Framework*. Washington, D.C.: USDOT, Federal Highway Administration. [http://www.ops.fhwa.dot.gov/freight/freight\\_analysis/faf/](http://www.ops.fhwa.dot.gov/freight/freight_analysis/faf/)
- Ver Ploeg, M., Breneman, V., Farrigan, T., Hamrick, K., Hopkins, D., Kaufman, P.,...& Tuckermanty, E. (2009). *Access to affordable and nutritious food: Measuring and understanding food deserts and their consequences*. Report to the U. S. Congress. Washington D.C.: United States Department of Agriculture, Educational Research Service. Administrative report AP-036. <http://www.ers.usda.gov/publications/ap/ap036/ap036.pdf>
- Vermont Sustainable Jobs Fund. (2011). *Farm to Plate Strategic Plan*. Montpelier, Vermont: Author. [http://www.vsjf.org/assets/files/Agriculture/Strat\\_Plan/F2P%20Executive%20Summary\\_6.27.11\\_High%20Quality.pdf](http://www.vsjf.org/assets/files/Agriculture/Strat_Plan/F2P%20Executive%20Summary_6.27.11_High%20Quality.pdf)
- Williams, B., & Imam, I. (Eds.). (2007). *Systems concepts in evaluation: An expert anthology*. Inverness, California: Edgepress.
- Wolfson, M. (2010). *Toronto's key industry clusters: Food & beverage*. Toronto, Ontario: City of Toronto. <http://www.toronto.ca/invest-in-toronto/food.htm>

## Evaluating food systems in comprehensive planning: Is the Mississippi Gulf Coast planning for food?

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### Abstract

The Mississippi Gulf Coast is famous for its shrimp, oysters, and crabs. Seafood is an essential part of both the culture and the diet of coastal residents. The last five years have been hard on the seafood industry, due first to Hurricane Katrina, then the national recession, and then the Deep-water Horizon oil spill. In the five years following the hurricane, all of the cities and counties on the Mississippi Gulf Coast prepared comprehensive plans covering the future of the land use, public facilities, and housing for the community for 20 or

more years. This paper examines the degree to which food systems have been incorporated into the comprehensive plans developed on the Mississippi Gulf Coast. It finds that food systems have not been adequately integrated into the plans. The comprehensive plans for the region begin to touch on food systems, but fail to create a factual basis to support planning for those systems, such as identification of the proportion of retail food establishments that accept food assistance programs. They set limited goals to support food systems and propose limited implementation measures in support of them. While the region as a whole has not yet planned for food systems, there are instances where communities are examining the future of food. This article concludes by offering recommendations on how communities can improve their plans relative to food systems as they move into their next phase of regional planning.

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### Keywords

comprehensive plan, food system, Gulf Coast, Mississippi, plan evaluation, seafood

## Introduction

“Eat Local” is a phrase that is being heard more and more across the United States. While it sounds great, there are significant concerns about food safety, environmental impact, economic impact, and food quality for both local and imported food. On the Mississippi Gulf Coast, seafood is a local food that has had significant historical, cultural, and economic importance for the region. Innovations in canning, ship-building, and transportation in the region led to Biloxi, Mississippi, becoming the seafood capital of the world. By the mid-nineteenth century, the invention of artificial ice and the extension of the railroad system through the Mississippi Gulf Coast led to the commercialization of the seafood industry (MDMR, 2009). The first seafood cannery opened in Biloxi in 1881, and by 1890 it was processing two million pounds (907,185 kg) of oysters and 614,000 pounds (278,506 kg) of shrimp annually. There were 12 canneries processing almost six million pounds (2,721,554 kg) of oysters and 4.4 million pounds (1,995,806 kg) of shrimp by 1902, and Biloxi was named the “Seafood Capital of the World” in 1903 (Mississippi Historical Society, n.d.). Seafood production continues to be an important industry on the Mississippi Gulf Coast. For example, in 2007 the Port of Pascagoula was ranked sixth nationally in terms of pounds of commercial seafood landed (NOAA, 2011).

While the seafood industry has continued to be of critical importance to the Gulf Coast, it is a threatened industry. In 2005, Hurricane Katrina destroyed many shrimping boats, processing facilities, and fishermen’s homes. The hurricane also resulted in significant degradation of Mississippi’s coastal environment, including substantial impact on such seafood habitat as the coastal marshes (Fletcher, 2007). Beyond the devastation of the natural environment there was substantial job loss across the coast, including in the seafood industry (NOAA, 2007). As the industry began to rebuild, the national recession resulted in decreased demand for Gulf Coast seafood and a more competitive global market, where imports competed with Gulf Coast seafood.

The Deepwater Horizon oil spill occurred off the coast of Pascagoula, Mississippi, on April 20, 2010, creating a massive “train wreck” along the Gulf Coast of Mississippi. Haeuber (1998) describes a “train wreck” as a clash between urban development and environmental protection objectives following a disaster. He suggests that an environmental disaster presents the opportunity for discussion about environmental goals that may not otherwise have occurred. He further argues that this collision of interests between different groups is instrumental in bringing about environmental protection efforts. The Deepwater Horizon oil spill directly affected the food system by contaminating seafood and the habitats of seafood. A “food system,” for the purposes of this article, is defined as the sequence of activities tying together food production, processing, distribution, access, consumption, waste, and their associated regulatory institutions and activities (American Planning Association, 2007).

The combination of environmental and economic loss created a train wreck that has engaged the public, elected leaders, and the business community in challenging debates over how to recover. Creating a sustainable future following an event like an oil spill is a difficult balance, as it must include consideration of environmental protection, the food system, social equity, and economic development goals. Campbell (1996) describes the combination of environmental, economic, and social goals as the “planner’s triangle,” with sustainable development at the center. Campbell argues that planners must deal constantly with the conflicts between promoting these three goals. Over the last five years, the public and planners have worked together to create comprehensive plans that attempted to create a more sustainable future.

Community planning efforts were initiated immediately following Hurricane Katrina. Governor Barbour’s Commission for Recovery, Rebuilding, and Renewal hosted the Mississippi Renewal Forum, which brought together more than 200 architects, planners, and community leaders to create initial rebuilding plans for each of the incor-



porated communities along the Mississippi Gulf Coast (Mississippi Renewal Forum, 2005; Evans-Cowley & Gough, 2009). In 2006, HUD provided funding to the Mississippi Development Authority to support comprehensive planning in Mississippi Gulf Coast cities and counties. The intent was to ensure that every Mississippi Gulf Coast community would have a comprehensive plan to guide its long-term changes. The grants were used by local governments to hire consultants to create comprehensive plans that met the needs of each individual community.

The HUD funding provided a unique opportunity for every community to simultaneously undertake comprehensive planning that could lead to a more sustainable and resilient future. Given the importance of the seafood industry, the author wondered whether communities integrated food systems into their comprehensive plans. As of June 2011, all of the communities along the Mississippi Gulf Coast had developed comprehensive plans, although three of the plans are still drafts and will soon be considered for adoption. The state of Mississippi's provision of expertise and financial assistance in initiating planning makes the Mississippi Gulf Coast an ideal location to compare planning efforts. It has 11 cities and three counties<sup>1</sup> that simultaneously undertook planning under very similar conditions with similar levels of funding, thereby allowing for comparisons of plans. Mississippi statute sets minimum requirements for a comprehensive plan: it must coordinate physical development based on present and future needs and express public policy for the development of the community. The comprehensive plan must include long-range goals and objectives, a land use plan, a transportation plan, and a community facilities plan (State of Mississippi, 1972). Food is not required as a specific element, but can easily be included as part of the land use, transportation, and community facilities elements. For example, where food stores are located can be part of land use, and how the public accesses food stores can be addressed in transportation.

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<sup>1</sup> These counties do the planning for unincorporated communities.

This study examines whether food is being considered as part of the planning for a more sustainable future of the Mississippi Gulf Coast. It seeks to answer three key research questions: (1) Are plans creating a factual basis to support decision-making that would support food systems? (2) Are plans setting goals and objectives in support of food systems? (3) Are plans proposing implementation strategies and policies that will support food systems? Support for the food system is determined by how the plan describes specifically how specific data, goals, or policies will improve some aspect of the food system.

The paper begins by focusing on selected literature related to food systems planning and plan evaluation. The methodology for this study is then discussed, followed by the results of the evaluation. The paper concludes with a discussion of policy decisions and recommendations for improving food system planning along the Mississippi Gulf Coast.

### **Literature Review**

Food system planning has received little emphasis over the past few decades. A study of 22 U.S. planning agencies that had either a food policy council or active food organizations found that planning agencies are only lightly involved in food system planning (Pothukuchi & Kaufman, 2000). The study found that the planners' role in the food system is generally reactive and piecemeal. Planners in these agencies reported being 50% or more involved only in the siting of food outlets, the design of food outlets, the siting and design of community gardens, and studies on the impact of the food sector on the local economy.

The result of the lack of integration of food system planning into the role of the city planner leads planners to fold grocery stores into general commercial development, without considering the high priority food plays in household needs. As another example, failure to devise comprehensive community-wide plans for composting food wastes results in their being disposed of in landfills. Planners responded that they are not engaged in food system planning because they only deal with the built

environment, that food systems are a rural issue, that the food system is dominated by the private market, that planners are not funded to undertake food system planning, and that there isn't a problem (Pothukuchi & Kaufman, 2000). Researchers have argued that the lack of integration of food system planning into the design of the city disproportionately impacts women. There have also been calls for designing neighborhoods with food features such as co-ops and community gardens (Franck & Ahrentzen, 1989; Hayden, 1981, 1986; Tinker, 1995, 1997).

Raja et al. (2008) call for the inclusion of food as an element of comprehensive plans. They recommend that comprehensive plans integrate food destinations, foodscapes, neighborhood access, and connections between transportation and food sources. Food destinations include farmers' markets, while foodscapes are edible landscapes. Pothukuchi and Kaufman (2000) argue that planners should engage in food system planning by compiling data on the community food system, analyzing the connections between food and other planning issues, assessing the current impact of planning on the local food system, and integrating food security into community goals. These calls to action for planners tend to be land-based in their approach, yet for the Mississippi Gulf Coast land is only one piece of the food system challenge.

Much of the historic literature linking food systems and planning has focused on agricultural preservation (Daniels, 1991; Paster, 2004). This literature points to the importance of protecting agricultural land from development encroachment. However, development encroachment is important from another perspective on the Mississippi Gulf Coast.

Seafood is a particularly important part of the food system on the Mississippi Gulf Coast. While seafood has been highly valued culturally, it has been difficult to reconcile a desire to preserve the nurseries that support fishing with population growth and land development. Human activities are the leading cause of the loss of ecosystem integrity (Peck, 1998). Looking across the Mississippi Gulf Coast, fragmentation of natural drainage systems

can be attributed to local planning decisions that have allowed development to repeatedly intrude into flood plains and wetland areas.

There is a direct link between land use policies and ecosystem health. Research has found that land use decisions affect the effective management of an ecosystem (Beatley, 2000; Endter-Wada, Blahna, Krannich, & Brunson, 1998; Kirklin, 1995; McGinnis, Woolley, & Gamman, 1999; Noss & Scott, 1997). Because land use policies and plans affect the ecosystem, and in turn the availability of seafood, comprehensive plans are an important source of control. Deliberative comprehensive plans and follow-through on implementation can protect critical habitats that support seafood production (Duerksen, Elliott, Thompson, Johnson, & Miller, 1997).

Food system protection can also be achieved through land use policies that discourage growth in flood-prone areas (Bechtol & Laurian, 2005; Berke, Crawford, Dixon, & Ericksen, 1999; Berke & French, 1994; Brody, 2003; Godschalk & Burby, 1999). Food system protection techniques can be regulatory, such as limiting development in a flood-prone area, or voluntary, such as encouraging urban farming practices. Both types of strategies can be incorporated into local land use decisions, but they require that local governments engage in comprehensive planning to change the development patterns in the community.

Local governments are also looking to siting requirements as a tool for limiting or providing increased access to food, for example, through the siting of farmers' markets, fruit stands, and mobile food vendors in public and private spaces (Hernandez-Lopez, 2010; Morales & Kettles, 2009). Other communities are reconsidering their limitations on urban animal husbandry (Duerksen, 2009).

Another way to promote the local food system is a locally grown food law that requires or provides incentives for purchasing food grown within a specific area. For example, cities are using locally grown food purchase policies that ensure that food

for public facilities is purchased locally where possible. The goal of these policies is to allow for local producers to expand their market locally and increase food safety, support the local economy, reduce storage time, and create more transparency and accountability (Denning, Graff, & Wooten, 2010).

The Mississippi Gulf Coast must determine the environmental impact on the estuaries, Mississippi Sound, and other areas affected by the oil spill, and how it can work with communities to clean up and protect these areas. The literature proposes that a disaster such as an oil spill may spur major environmental initiatives that can work in favor of protecting sensitive areas. Haeuber's (1998) description of the clash between urban development and environmental protection objectives following a disaster as a train wreck suggests that the Mississippi Gulf Coast is ripe for new environmental protection opportunities that could protect the food system.

Public officials and planners are charged with making complex decisions that meet environmental protection, social equity, and economic development goals following a train wreck (Blowers, 1993; Campbell, 1996). Planning for food systems is an example of a topic that has implications for environmental protection, social equity, and economic development. Campbell (1996) argues that sustainability may be very hard to achieve because of the difficulty in breaking the concept down into small implementable steps. There are also political challenges, where economic values may trump environmental or social values. What is more important: food security, seafood production, or estuary protection? Planners and public officials can find it difficult to solve the challenges facing food systems.

One way to address the complexity of these and other competing interests is through the use of collaborative planning that integrates the efforts of planners, public officials, and the public (Beatley, 1995; Blowers, 1993; Campbell, 1996). The participation of all parties can result in valuable exchanges of ideas about how to create a more

sustainable food system. Public involvement in comprehensive planning is essential in bringing about change through supporting community farmers' markets, changing zoning regulations, and encouraging capital investment in harbor facilities. Several researchers have identified the "window of opportunity" phenomenon, in which public interest peaks after a focusing event, such as an oil spill, and then declines over time (Birkland, 1996, 1997; Lindell & Perry, 1999; Prater & Lindell, 2000). In collaborative planning opportunities, the public may feel empowered to make decisions about its future and hold ownership in the final plan (Daniels & Walker, 2001; Innes, 1996; Roberts, 2006; Sowman & Brown, 2006). Research has found that participation at the beginning of the planning process increases trust and support for environmental protection (Yaffee & Wondolleck, 1997). Participatory planning processes can help members of the public understand their behaviors and how they affect the sustainability of the community (Adolfsson, 2002; Grant, Manuel, & Joudrey, 1996). In a study of multijurisdictional environmental problems, researchers found that strong natural resource protection plans resulted from trust built through a collaborative planning process (Innes, 1996). In light of the recent oil spill and preceding hurricane, one could expect public interest in protecting natural resources to be high (Burby & French, 1981; Wondolleck & Yaffee, 2000).

Given the importance of food system planning, how can it best be incorporated into comprehensive plans? Protocols for evaluating comprehensive plans have been developed. The protocol and evaluation criteria used by numerous researchers, which are discussed in the following methodology section, were reviewed and evaluated for appropriateness to include in this evaluation.

## **Methodology**

In order to answer the research questions in this study, each of the local governments on the Gulf Coast was contacted in winter 2011 to request a copy of their comprehensive plan. All 14 of the

communities participated by providing copies of the comprehensive plans.<sup>2</sup>

### *Coding Instrument*

In order to systematically evaluate the integration of food systems into the comprehensive plans, the methodology relies on a detailed plan evaluation protocol that is designed specifically for the evaluation of food systems. While seafood was an important aspect of this study, seafood represents just one part of the food system. Coastal communities should be planning for the entire food system, including seafood. This protocol is built on the idea that food systems can best be planned for if the community's comprehensive plan creates a factual basis for food systems that supports decision-making (such as identification of the proportion of retail food establishments that accept food assistance programs), sets goals and objectives, and identifies implementation strategies intended to advance the food system. Existing plan evaluation literature identifies standard methods for plan evaluation (Berke & French, 1994; Berke et al., 1999; Chaplin & Kaiser, 1979; Kaiser, Godschalk, & Chapin, 1995; Srivastava & Laurian, 2006). The method used in this study utilizes the protocols developed in previous evaluations of comprehensive plans (Baer, 1997; Berke & French, 1994; Berke et al., 1999; Berke et al., 2006; Brody, 2003; Burby & May, 1997; Evans-Cowley & Gough, 2007; Evans-Cowley & Gough, 2008; Laurien et al., 2004; Norton, 2006; Srivastava & Laurian, 2006). However, the previous plan evaluations examined food systems on a very limited basis. The criteria for evaluation in these previous studies have some elements related to food systems, such as the use of transfer of development rights as a policy. In order to develop criteria to evaluate plans, the author examined indicators used in the previous studies and examined those developed to measure healthy and sustainable communities, such as the Healthy Development Measurement Tool used by

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<sup>2</sup> One community declined to provide a copy of its plan, citing that it had not yet been adopted by the city council. The researcher was able to obtain a copy of the draft plan, which was at the time being presented in public meetings, from another planning agency in the region.

the San Francisco Department of Public Health and the Sustainable Community Development Code Framework (San Francisco Department of Health, 2006; Duerksen, 2009). The literature points to important potential indicators. For example, Pothukuchi and Kaufman (2000) recommend that data about local food and food security be collected as part of the planning process. This led to the author's inclusion of factual basis measures in the plan evaluation, such as identification of the proportion of retail food establishments that accept food assistance programs. A number of researchers point to the importance of agricultural preservation (Daniels, 1991; Duncan, 1984; Paster, 2004), which led to the inclusion of a goal indicator "concentrate growth away from agriculture." There is a wide array of potential implementation policies and strategies that can support food systems, for example, siting farmers' markets and permitting mobile food vendors, both of which were included as indicators (Hernandez-Lopez, 2010; Morales & Kettles, 2009). Local food purchasing policies is another example that emerged from the literature (Denning et al., 2010).

A total of 57 indicators are used to evaluate the plans (see appendix, table 1). Twenty-four indicators are used to evaluate the factual basis of food systems, which assists in providing adequate information upon which goals and policies can be set. Seven indicators are used to evaluate plan goals and objectives. Twenty-six indicators are used to determine strategies to achieve food system goals.

### *Coding Process*

Each comprehensive plan indicator was evaluated on a scale of zero to two. For the factual basis, a score of zero indicates that the criteria was absent in the plan. A score of one indicates that criteria was present but not detailed, and two indicates that the criteria was present and detailed. For example, if a plan does not discuss farmers' markets, a score of zero would be marked. If the plan mentions farmers' markets but provides no detail, it would receive a score of one. For a plan that has a detailed explanation of farmers' markets, including discussion of the location of markets and types of food products, a score of two would be marked.

For goals, a zero is assigned if that indicator was absent. One indicates that the indicator was present and recommended, and two indicates that the indicator was present and required. For example, one of the indicators is the strengthening of the local and regional economy by promoting local and regional food systems. The Biloxi comprehensive plan received a score of two on this goal because it includes the following: “Ensure that the commercial seafood industry remains a vital part of Biloxi’s economy, heritage, and appeal as a premiere visitor destination” (City of Biloxi, 2010, p. 131).

Following the initial development of the plan evaluation indicators, a colleague reviewed the criteria and provided feedback. Mississippi Gulf Coast planners then gave feedback on the criteria. Based on suggestions from these professionals the indicators were finalized. Each plan was then reviewed and coded. The author evaluated a trial plan in a community outside of Mississippi, identifying questions related to interpretation and refining the protocol until it was standardized.

#### *Score Calculation*

Scores were calculated in three steps. In the first step, we totaled the scores in each evaluation by category. For example, a plan might receive nine out of 16 points in the goals category. In the second step, we totaled the score across all categories. In the third step, we divided this score by the total number of points available to create a percentage score. Each category carried an equal weight. Due to the different number of indicators in each category, an averaged percentage score is calculated by summing the percentage score in each of the three categories and dividing by three, resulting in a normalized score. Higher percentage scores indicate a higher degree of integration of food systems. The overall plan score represents the degree to which the plan has a factual basis, specifies food system goals and objectives, and includes implementation strategies for achieving the plan’s food system goals. In this paper, the percentage scores by category and for the entire plan, rather than individual point scores, are reported.

## **Results**

While the author believed that there would be variation in the degree to which the plans address food systems, the fact that many simply did not address food systems at all was surprising, especially since seafood is such an important part of both the historical development of the region and its current economy. The average percentage scores of the comprehensive plans across categories ranged from 3.9% to 38.8% (see table 1). The highest score was for Harrison County, whose plan contains a Healthy Communities chapter that specifically focuses on food-system related proposals. For example, one of the actions is to build farmers’ market pavilions onto existing community centers in the rural areas of the county (see figure 1) (Harrison County, 2008). This plan has a goal to increase access to healthy food options in Harrison County (Harrison County, 2006a).

#### *Factual Basis*

The plans generally received low scores for the factual basis for food systems, with Long Beach’s plan receiving the lowest score, just 4.2% of the available points. Some of the factors that contribute to the low scores include plans that do not identify the location of food production facilities and/or that do not appropriately identify preservation areas as wetlands or flood plains. Some plans omit natural and environmental elements altogether, such as Long Beach, whose plan emphasizes urban redevelopment but never discusses the community’s environmental conditions and their relationship to support of the food system.

The Harrison County comprehensive plan received the highest factual basis score of 29.2%. The county has some agriculture as well as a fish hatchery, both of which resulted in some emphasis on food systems. Additionally, its plan includes data about the preventable disease incidence associated with an unhealthy diet (Harrison County, 2008). Biloxi, Ocean Springs, and Pascagoula both scored more than 18% on factual basis indicators. Both Biloxi and Pascagoula identified the historical role of food systems in their communities. For example, Biloxi was referred to as “the seafood capital

**Figure 1. These Proposed Shade Structures Would Provide Protection for Farmers at Harrison County Farmers' Markets**



Source: Remya Kumar

of the world” at the turn of the twentieth century because of its pioneering work in seafood canning (City of Biloxi, 2010). Ocean Springs identified the local food bank (City of Ocean Springs, 2010). All of these communities focused on documenting physical areas and facilities that support mariculture.

#### *Goals and Objectives*

Eight of the 12 plans examined did not have any goals or objectives that directly support food systems. The four remaining plans varied in their supportive goals. Food systems were also considered from an economic perspective. Pass Christian’s plan emphasizes the importance of rebuilding the

harbor because 97% of the oysters harvested in Mississippi come from the reefs off Pass Christian (City of Pass Christian, 2006). Harrison County also focuses on the economics of food systems by supporting the economic vitality of the commercial and charter fishing industries (Harrison County, 2008). Based on the fact that the goals and objectives in many of the plans resulted from direct citizen input, it appears that citizens tend to be more interested in economic development than food systems.

Other plans viewed food systems from alternative perspectives. For example, Hancock County and Gautier County support the separation of devel-

opment from agricultural areas. Harrison County's plan was the most specific about access to food by residents. For example, its objectives include improving food access, promoting community gardening, promoting farmers' markets, and developing a land bank to bring vacant and abandoned properties into agriculturally productive use (Harrison County, 2008).

#### *Policies, Tools, and Strategies*

Because only a limited number of plans had goals and objectives related to food systems, it is not surprising that the plans promote a limited number of policies, tools, and strategies for achieving food system goals. The plans scored poorly for their strategies for supporting food systems, ranging from 3.7% to 46.3%. It is important to note that a number of the strategies could reach the same goal, so a low score by and of itself does not mean that a plan did not consider tools for achieving food system goals.

The key focus of the implementation measures was seafood. Where there were food system goals, they were primarily posed from an economic development perspective. Not surprisingly, many of the implementation strategies are also from an economic development perspective, including improving physical facilities and implementing land use policies to support working waterfronts.

For example, Biloxi, Gulfport, and Pass Christian have plans to expand the physical infrastructure that supports the seafood industry (City of Biloxi, 2009; City of Gulfport, 2010; City of Pass Christian, 2006). These would be achieved in different ways. For example, Gulfport is creating a new marina to support recreational and commercial charter fishing, while Pass Christian is supporting the movement of shrimpers to their harbor. A number of the communities, including Hancock County, Harrison County, and Biloxi, identified land use as an opportunity to support the seafood industry through working waterfronts (Hancock County, 2008). Biloxi's plan (2009) has a series of strategies that directly support the seafood industry, including:

- “Enact LDO [Land Development Ordinance] provisions and other strategies to support the seafood industry, other working waterfront uses, and recreational uses” (p. 22)
- “Limit industrial uses, other than seafood industry related, on the Peninsula” (p. 25)
- “Create a waterfront/commercial seafood district” (p. 36)
- “The proposed Seafood Village on the Back Bay... would provide dedicated berthing space for the commercial fishing fleet and processing facilities while also serving as a tourist attraction and destination with a seafood market” (p. 83)

Other communities, such as Biloxi, Long Beach, Moss Point, and Jackson County, are focusing on enhancing water access for tourism and recreational access (City of Biloxi, 2009; City of Gautier, 2009; City of Moss Point, 2009; Hancock County, 2008; Jackson County, 2009). Long Beach, for example, plans to create a harbor district that would cater to recreational boaters (City of Long Beach, 2010).

Interestingly, Waveland is the only community that mentions sustainability in this context, suggesting that the city should build a sustainable marine facility; however, no further detail is provided (City of Waveland, 2009).

Beyond promoting water access, the plans also promote the use of buffering along waterfronts — particularly bayous and rivers — and support the clustering of development away from natural resources. Fifty-seven percent of plans include provisions for either clustering or buffering. A number of the plans mention wetlands preservation and other conservation efforts, yet in only one of the plans is conservation tied to fishing: Bay St. Louis proposes acquiring wetlands to support nurseries for fisheries (City of Bay St. Louis, 2008). Education centered around marine life, and the seafood life cycle, was a strategy in two communi-

ties (City of Gulfport, 2010; City of Bay St. Louis, 2008).

The implementation strategies in the plans primarily focused on seafood, yet there were a few instances where communities identified additional opportunities in the food system. The implementation efforts were focused on community gardens, urban agriculture, and farmers' markets (City of Bay St. Louis, 2008; City of Biloxi, 2009; City of Moss Point, 2009; Harrison County, 2008; Jackson County, 2009). Figure 1 illustrates the Harrison County Farmers' Market concept, which would build shaded, open additions onto existing community centers to provide access to farmers' markets in the rural areas of the county.

### *Overarching Results*

Prior research supports the findings of the present study. Pothukuchi and Kaufman (2000) examined 22 cities and found that food system planning was happening in a very limited way. For example, planners are engaged in siting of grocery stores. This trend was similar on the Mississippi Gulf Coast, as "food system" goals tended to be focused on tourism and economic opportunity rather than food production or food security.

Conroy and Berke (2004) found that the use of sustainability concepts, such as a healthy food system, did not translate into development of policies, and that even though plans may be created with the principles of sustainability, the results often lack sustainable development implementation strategies. Similar to these findings, all the plans encouraged sustainable development, but the implementation strategy scores remained low because of their lack of focus on food.

While the overall results of this study point to a lack of focus on food, one plan did show a significant focus on food: Harrison County. The zoning administrator for the county at the outset of the plan requested that this plan "be the most sustainable plan on the coast" (P. Bonck, Harrison County Zoning Administrator, personal communication, January 4, 2007). This plan specifically identified healthy communities as a key element to

consider for the future. The plan has an extensive factual basis to inform the plan making, considering everything from soil suitability to diet-related diseases. This plan was supplemented by a citizen participation process that is well-documented in the plan, which specifically included questions about where people shop, what is missing from their grocery stores, and whether they need better access to food. There are clear connections between what the citizens said they want for their community and the plan's goals and objectives. The plan identified clear implementation policies, such as adopting an edible landscaping ordinance. The overall result has been tremendous community and political support for the plan and its implementation. As an example, since 2005 three new farmers' markets have been created in Harrison County. Participants in the planning process created a nonprofit organization, Real Food Gulf Coast,<sup>3</sup> dedicated to growing and supporting a sustainable food economy on the Mississippi Gulf Coast. This organization emerged from an alliance of two farmers' market managers who were committed to making sure the people of the coast understand where their food comes from and to promote regional production and direct sales of these foods to consumers.

The Harrison County plan points to the potential for broader food system planning in the region. How can plans be improved to better address food systems? The conclusion of this paper addresses ways that Mississippi Gulf Coast communities can better plan for food systems.

### **Conclusion**

The author expected that because food system planning is an emerging issue for professional planners, the level of inclusion of food system elements in the Gulf Coast comprehensive plans evaluated would be low, particularly as they relate to issues such as food security. However, given the importance of the seafood industry, the author expected that there would be inclusion of significant plan elements related to seafood. The degree

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<sup>3</sup> Real Food Gulf Coast's website is <http://www.realfoodgulfcoast.org>



to which food systems are incorporated into the community plans varied. Some communities integrated food systems well, while others failed to integrate them into their plans almost altogether. In part this may be a result of the small size and limited capacity of some communities; in other cases it may be because community members have not flagged food as a significant issue. Where food systems were included, there was a clear emphasis on the seafood industry. This emphasis focused primarily on community facilities, with limited attention to the land use and transportation issues that also affect the food system. In the communities where seafood was not emphasized, the emphasis was on expansion of ports and other facilities that support global trade, including foodstuffs. Given that comprehensive plans in Mississippi are expected to cover all three of these areas (land use, transportation, and community facilities), one would hope to see the intersections of food with these topics considered.

One can argue that food is an essential element of sustainability, and therefore considering the intersection of food with issues of economic, equitable, and environmental sustainability should be a part of comprehensive planning efforts. One partial explanation of why plans didn't robustly consider food may be the degree of complexity of the social, economic, and environmental problems facing the region in the wake of Hurricane Katrina. Campbell (1996) argues that planners have not yet determined how to get to sustainable development, which may be why the plans have not been effectively able to balance economic, social, and environmental needs. The literature suggests that in the aftermath of a natural disaster there will be a high degree of interest in integrating environmental protection measures, which could protect the food system (Birkland, 1996, 1997; Blowers, 1993; Burby & French, 1981; Campbell, 1996; Lindell and Perry, 1999; Prater and Lindell, 2000). Yet this study found that for planners, economic development was more important than environmental protection as it relates to food systems. In the Gulf Coast region, both citizens and local officials were clearly focused on the immediate challenges of rebuilding housing and creating jobs, rather than on longer-

term issues such as the preservation of farmland or seafood habitat.

While this article finds that the comprehensive planning efforts on the Mississippi Gulf Coast have examined food systems on a limited basis, there is optimism for the future. HUD recently awarded the Gulf Regional Planning Commission a US\$2 million grant to undertake a regional sustainability planning process. The plan will include an element called "Savor the Coast: A recipe for regional food system sustainability," that will address the regional food system. This provides an opportunity for the region to work together to address food system challenges.

In guiding this effort and other planning efforts the author has several key recommendations. To combat the idea that food is a rural issue that is outside the bounds of the jurisdiction, planners should consider the foodshed, a geographic area where foods can be grown (Getz, 1991). Communities should understand where their food comes from and how they access it. This could include a historical review of agriculture production in the foodshed, estimates of the ability of the foodshed to produce enough food to feed the population, identification of seasonal foods, and opportunities for urban agriculture (Feenstra, 1997). Examining food insecurity factors such as distance to food stores, income, and transit accessibility can lead to an understanding of neighborhood-level conditions that can lead to solutions supporting access to healthy food (Raja et al., 2008).

Elevating the importance of food planning can be achieved through stronger engagement of food system stakeholders. By creating stronger collaborative planning processes that integrate all stakeholders, from the low-income resident to the seafood processor, communities can develop a higher level of interest in planning (Godschalk, Brody, & Burby, 2003; Innes, 1996). In the case of the Mississippi Gulf Coast there can be regional collaboration to take on food system planning through its regional sustainability planning process. Other ways to support stakeholder engagement could include a city creating a department of food,

regions creating a food policy council, and city planning departments supporting the work of food system planning (Pothukuchi & Kaufman, 1999).

The comprehensive plans in this study minimally discussed food organizations. Where there was discussion it was typically about regulatory or funding agencies, such as the Mississippi Department of Marine Resources. As part of the planning process, there should be efforts to reach out to organizations such as Real Food Gulf Coast, the Mississippi Gulf Coast Seafood Association, the Farm Service Agency, the Mississippi Food Policy Council, and others that bring together individuals with an interest in the food system. In addition to engaging local stakeholders, it will also be important to engage regional, state, and federal agencies and organizations that are conducting research and making decisions directly related to food systems. For example, the Mississippi Food Policy Council, Mississippi State University's Extension Service and Coastal Research Center, the Mississippi Department of Agriculture and Commerce, the Mississippi Department of Marine Resources, and the Gulf Coast Fisheries Council are all examples of key organizations that can be engaged in local food system planning.

All these organizations can be partners in gathering factual information, and identifying challenges facing the food system and strategies to collectively support the development of the local food system. Working in partnerships would help start the challenging discussions about where development and investment in the food system are most appropriate.

There are a number of regulatory measures and policy tools that are available to local governments. Morales and Kettles (2009) call for revising vendor ordinances. Currently on the coast there is mobile vending of shrimp. A study of mobile vending, evaluating the opportunities for expanded healthy food access is one option. Incentivizing the siting of food stores that carry healthy food choices is another option. Food purchasing and diversion policies could be adopted by large-scale institutional consumers to support the local food system.

Land use policies that support food systems by designating areas for food processing and food distribution, as well as preserving land for food production, can support the food system. An example of such a policy in action might be the creation of seafood hubs to allow for the seafood value chain to be centered in one location.

Supporting the food chain could also include consideration of policies to support mobile meat processing. Farmers on the Mississippi Gulf Coast note that they have to drive their cattle to Alabama because there are no processing facilities on the coast. Policies that would support cottage-scale food processing can provide the opportunity for small growers to add value to their products. Permitting programs for direct market sales of produce, meat, and seafood should be considered.

Currently the Mississippi Department of Health's regulations can be prohibitively onerous for small producers and processors who are trying to market their products directly. For example, shrimp can only be sold by the fisher if there is no processing. Removal of the heads is considered processing. However, even this minimal level of processing would make the product more desirable for consumers. While Mississippi has a farm to school program, only 10 farmers participate because the barriers to entry are high. A new effort might be starting up a sea to school program, increasing access to local food for schoolchildren. The Women, Infant, and Children (WIC) program is currently delivered through a county distribution center system. Changing the system to allow WIC recipients to redeem their benefits in local grocery stores would increase both redemption rates and access to healthy food by needy families. Regulations on backyard and large-scale composting and biogas facilities should be evaluated. These are just a few examples of the types of policies and regulations that could be included as part of food system planning.

Beyond regulatory and policy implementation, significant economic development opportunities exist. Small grant and loan programs can create significant opportunities for diversity in the availability of

local foods which would increase market opportunities for producers and processors. A small loan program to support high tunnel greenhouses would allow for a longer growing season for fruits and vegetables. A small grant from Market Umbrella allowed the start-up of a community supported fishery (CSF) in New Orleans. The CSF used the grant funds to purchase insulated bags that were provided to each customer, who was then able to pick up the weekly share at a local farmers' market and safely carry it home.

Pennsylvania's Fresh Food Financing Initiative provides funding to support the provision of fresh food in food-insecure neighborhoods. Another possibility is a farmer and fisher co-op that can jointly put together fresh market baskets that can be delivered to food-insecure neighborhoods and could be paid for with Supplemental Nutrition Assistance Program (SNAP) benefits. Prior to Hurricane Katrina there were seafood markets at harbors. Bringing these markets back would allow fishers to sell directly to consumers at the docks. The image of Gulf Coast seafood was negatively affected by the Deepwater Horizon oil spill. "Buy Fresh-Buy Local" campaigns could boost local seafood sales, along with other locally produced foods.

Beyond grants and loans, providing facilities can benefit the community. A number of the plans promoted the idea of adding farmers' markets. The plans should be specific about what type of farmers' market is desired. Is it a market for locally produced food, or is it a produce market that provides access to resold produce, or some other market that may integrate nonfood goods such as arts and crafts? Markets serve many purposes. If the goal is to promote the local food system, this should be explicit in the promotion of local farmers' markets. Another example of a community facility is a commercial community kitchen, which can provide small start-up businesses with a place to process their food. Providing economic development incentives that focus on locally driven job creation can support the food system by allowing small food businesses the opportunity to grow. Many of the region's food pantries are located in neighbor-

hoods affected by hurricanes. Consideration should be given to hurricane-proofing critical food distribution facilities.

A robust food system planning effort will consider all aspects of the food system and make culturally appropriate determinations as to which goals and implementation strategies are most appropriate. The Mississippi Gulf Coast provides an example of a region where food system planning efforts can be improved. With the current sustainability planning effort underway, there is significant promise that regional food system planning will be enhanced. There is a need for further research to explore the success of implementation strategies for food systems that emerge from comprehensive planning efforts.

## References

- Adolfsson, J. S. (2002). Local agenda 21 in four Swedish municipalities: A tool towards sustainability? *Journal of Environmental Planning and Management*, 45(2), 219–244. <http://dx.doi.org/10.1080/09640560220116314>
- American Planning Association (APA). (2007). *American Planning Association policy guide on community and regional food planning*. Prepared for the American Planning Association's Legislative and Policy Committee.
- Baer, W. C. (1997). General plan evaluation criteria: An approach to making better plans. *Journal of the American Planning Association*, 63(3), 329–344. <http://dx.doi.org/10.1080/01944369708975926>
- Beatley, T. (2000). Preserving biodiversity: Challenges for planners. *Journal of the American Planning Association*, 66(1), 5–20. <http://dx.doi.org/10.1080/01944360008976080>
- Beatley, T. (1995). Planning and sustainability: The elements of a new (improved?) paradigm. *Journal of Planning Literature*, 9(4), 383–395. <http://dx.doi.org/10.1177/088541229500900405>
- Bechtol, V., & Laurian, L. (2005). Restoring straightened rivers for sustainable flood mitigation. *Disaster Prevention and Management: An International Journal*, 14(1), 6–19. <http://dx.doi.org/10.1108/09653560510583806>
- Berke, P. R. (2002). Does sustainable development offer a new direction for planning? Challenges for the twenty-first century. *Journal of Planning Literature*, 17, 21–36. <http://dx.doi.org/10.1177/088122017001002>

- Berke, P. R., & French, S. P. (1994). The influence of state planning on local plan quality. *Journal of Planning Education and Research*, 13(4), 237–250. <http://dx.doi.org/10.1177/0739456X9401300401>
- Berke, P. R., Backhurst, M., Day, M., Ericksen, N., Laurian, L., Crawford, J., & Dixon, J. (2006). What makes plan implementation successful? An evaluation of local plans and implementation practices in New Zealand. *Environment and Planning B: Planning and Design*, 33, 581–600. <http://dx.doi.org/10.1068/b31166>
- Berke, P. R., Crawford, J., Dixon, J. E., & Ericksen, N. J. (1999). Do cooperative environmental planning mandates produce good plans? Empirical results from the New Zealand experience. *Environment and Planning B: Planning and Design*, 26, 643–664. <http://dx.doi.org/10.1068/b260643>
- Birkland, T. A. (1996). Natural disasters as focusing events: Policy communities and political response. *International Journal of Mass Emergencies and Disasters*, 14(2), 221–243.
- Birkland, T. A. (1997). *After disaster: Agenda setting, public policy, and focusing events*. Washington, D.C.: Georgetown University Press.
- Blowers, A. (1993). The time for change. In A. Blowers (Ed.), *Planning for a Sustainable Environment* (pp. 1–18), London, UK: Earthscan.
- Brody, S. D., Godschalk, D. R., & Burby, R. J. (2003). Mandating citizen participation in plan making. *Journal of the American Planning Association*, 69(3), 245–264. <http://dx.doi.org/10.1080/01944360308978018>
- Brody, S. D. (2003). Measuring the effects of stakeholder participation on the quality of local plans based on the principles of collaborative ecosystem management. *Journal of Planning Education and Research*, 22, 407–419. <http://dx.doi.org/10.1177/0739456X03022004007>
- Burby, R. J., & French, S. (1981). Coping with floods: The land use management paradox. *Journal of the American Planning Association*, 47(3), 289–300. <http://dx.doi.org/10.1080/01944368108976511>
- Burby, R. J., & May, P. J. (1997). *Making governments plan: State experiments in managing land use*. Baltimore, Maryland: Johns Hopkins Press.
- Campbell, S. (1996). Green cities, growing cities, just cities? Urban planning and the contradictions of sustainable development. *Journal of the American Planning Association*, 62, 296–313. <http://dx.doi.org/10.1080/01944369608975696>
- Chaplin, S., & Kaiser, E. (1979). *Urban land use planning*. Champaign, Illinois: University of Illinois Press.
- City of Bay St. Louis. (2008). *Bay St. Louis comprehensive plan update*. Bay St. Louis, Mississippi: Author.
- City of Biloxi. (2010). *City of Biloxi comprehensive plan*. Biloxi, Mississippi: Author.
- City of Gulfport. (2010). *Gulfport 2030 comprehensive plan*. Gulfport, Mississippi: Author.
- City of Long Beach. (2009). *Long Beach, Mississippi, comprehensive plan*. Long Beach, Mississippi: Author.
- City of Ocean Springs. (2010). *City of Ocean Springs comprehensive plan*. Ocean Springs, Mississippi: Author.
- City of Pass Christian. (2006). *The City of Pass Christian comprehensive plan*. Retrieved from <http://www.ci.pass-christian.ms.us/2compplan20061026.pdf>
- Conroy, M. M., & Berke, P. R. (2004). What makes a good sustainable development plan? An analysis of factors that influence principles of sustainable development. *Environment and Planning A*, 36(8), 1381–1396. <http://dx.doi.org/10.1068/a367>
- Daniels, T. L. (1991). The purchase of development rights: Preserving agricultural land and open space. *Journal of the American Planning Association*, 57, 421–431.
- Daniels, S. E., & Walker, G. (2001). *Working through environmental conflict: The collaborative learning approach*. Westport, Connecticut: Praeger.
- Denning, B. P., Graff, S., & Wooten, H. (2010). Laws to require purchase of locally grown food and constitutional limits on state and local government: Suggestions for policymakers and advocates. *Journal of Agriculture, Food Systems, and Community Development*, 1(1), 139–148. <http://dx.doi.org/10.5304/jafscd.2010.011.014>
- Duerksen, C., Elliot, D., Thompson, N., Johnson, E., & Miller, J. (1997). *Habitat protection planning: Where the wild things are* (APA Planning Advisory Service Report No. 470/471) American Planning Association: Chicago.
- Duerksen, C. (2009). *Sustainable community development code framework*. Denver, Colorado: University of Denver Sturm College of Law. Retrieved from <http://law.du.edu/index.php/rmlui/rmlui-practice/code-framework>
- Endter-Wada, J., Blahna, D., Krannich, R., & Brunson, M. (1998). A framework for understanding social science contributions to ecosystem management. *Ecological Applications*, 8(3), 891–904. [http://dx.doi.org/10.1890/1051-0761\(1998\)008\[0891:AFFUSS\]2.0.CO;2](http://dx.doi.org/10.1890/1051-0761(1998)008[0891:AFFUSS]2.0.CO;2)

- Evans-Cowley, J. S., & Gough, M. Z. (2007). Is hazard mitigation being incorporated into post-Katrina plans in Mississippi? *International Journal of Mass Emergencies and Hazards*, 25(3), 177–217.
- Evans-Cowley, J. S., & Gough, M. Z. (2008). Evaluating environmental planning in post-Katrina plans in Mississippi? *Journal of Environmental Planning and Management*, 51(3), 399–419.
- Evans-Cowley, J. S., & Gough, M. Z. (2009). Evaluating New Urbanist plans in post-Katrina Mississippi. *Journal of Urban Design*, 14(4), 439–461.
- Feenstra, G. W. (1997). Local food systems and sustainable communities. *American Journal of Alternative Agriculture*, 12(1), 28–36.  
<http://dx.doi.org/10.1017/S0889189300007165>
- Fletcher, M. (2007). *Hurricane Katrina impacts and responses in pristine coastal salt marsh estuary*. Retrieved from University of South Carolina website:  
<http://www.sc.edu/katrinacrisis/fletcher.shtml>
- Franck, K. A., & Ahrentzen, S. (Eds.) (1989). *New households, new housing*. New York, New York: Van Nostrand Reinhold.
- Getz, A. (1991, October). Urban foodsheds. *The Permaculture Activist*, 24, 26–27.
- Godschalk, D. R., & Burby, R. (1999). Unleashing the power to create disaster-resistant communities. *Journal of the American Planning Association*, 65(3), 247–258.
- Godschalk, D. R., Brody, S., & Burby, R. (2003). Public participation in natural hazard mitigation policy formation: Challenges for comprehensive planning. *Journal of Environmental Planning and Management*, 46(5), 733–754. <http://dx.doi.org/10.1080/0964056032000138463>
- Grant, J., Manuel, P., & Joudrey, D. (1996). A framework for planning sustainable residential landscapes. *Journal of the American Planning Association*, 62, 331–345. <http://dx.doi.org/10.1080/01944369608975698>
- Harrison County. (2008). *2030 Harrison County comprehensive plan*. Harrison County, Mississippi: Author.
- Hayden, D. (1981). *The Grand Domestic Revolution*. Cambridge, Massachusetts: MIT Press.
- Hayden, D. (1986). *Redesigning the American Dream: The future of housing, work and family life*. New York, New York: Norton and Company.
- Haeuber, R. (1998). Ecosystem management and environmental policy in the United States: Open window or closed door? *Landscape and Urban Planning*, 40, 221–233. [http://dx.doi.org/10.1016/S0169-2046\(97\)00115-1](http://dx.doi.org/10.1016/S0169-2046(97)00115-1)
- Hernandez-Lopez, E. (2010). *LA's taco truck war: How law cooks food culture contests*. Social Science Research Network. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1694747](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1694747)
- Innes, J. E. (1996). Planning through consensus building. *Journal of the American Planning Association*, 62, 460–472. <http://dx.doi.org/10.1080/01944369608975712>
- Kaiser, E., Godschalk, D., & Chapin, S. (1995). *Urban Land Use Planning* (5th edition). Chicago: University of Illinois Press.
- Kirklin, J. (1995). Protecting species and ecosystems within planning process. *Environmental Planning*, 12(4), 6–13.
- Laurien, L., Day, M., Berke, P., Ericksen, N., Backhurse, M., Crawford, J., & Dixon, J. (2004). Evaluating plan implementation: A conformance-based methodology. *Journal of the American Planning Association*, 70(4), 471–480. <http://dx.doi.org/10.1080/01944360408976395>
- Lindell, M. K., & Perry, R. W. (1999). Household adjustment to earthquake hazard: A review of research. *Environment and Behavior*, 32(4), 590–630.
- McGinnis, M., Woolley, J., & Gamman, J. (1999). Bioregional conflict resolution: Rebuilding community in watershed planning and organizing. *Environmental Management*, 24(1), 1–12. <http://dx.doi.org/10.1007/s002679900210>
- Mississippi Historical Society. (n.d.). *The seafood industry in Biloxi: Its early history, 1848–1930*. Mississippi History Now, the Mississippi Historical Society. Retrieved from the Mississippi Historical Society website: <http://mshistory.k12.ms.us/articles/209/the-seafood-industry-in-biloxi-its-...2>
- Mississippi Department of Marine Resources (MDMR) and Office of Coastal Management and Planning. (2009). *Mississippi Gulf Coast National Heritage Area Management Plan and Environmental Assessment*. Biloxi, Mississippi.
- Mississippi Renewal Forum. (2005). *The People*. Retrieved 19 April 2007 from <http://www.mississippirenewal.com/info/people.html>
- Morales, A., & Kettles, G. (2009). Healthy food outside: Farmers' markets, taco trucks, and sidewalk fruit vendors. *The Journal of Contemporary Health Law and Policy*, 26(20), 20–48.
- National Oceanic and Atmospheric Administration (NOAA). (2007). *Environmental impacts of Hurricane Katrina*. Retrieved 19 April 2007 from [http://www.st.nmfs.noaa.gov/hurricane\\_katrina/press\\_releases.html](http://www.st.nmfs.noaa.gov/hurricane_katrina/press_releases.html)

- National Oceanic and Atmospheric Administration (NOAA). (2011). *Safe and sustainable seafood supply*. Retrieved from <http://d276864.h39.zee-hosting.com/page.asp?id=189>
- Noss, R., & Scott, M. (1997). Ecosystem protection and restoration: The core of ecosystem management. In M. Boyce & A. Hanley (Eds.). *Ecosystem management: Applications for sustainable forest and wildlife resources* (pp. 239–264). New Haven, Connecticut: Yale University Press.
- Norton, R. K. (2006). *Managing development in coastal Michigan: What communities have, what they say they want, and what they'll likely get*. Paper presented at the Association of Collegiate Schools of Planning, Fort Worth, Texas, November 9, 2006.
- Paster, E. (2004). Preservation of agricultural lands through land use planning tools and techniques. *Natural Resources Journal*, 44(1), 283–318.
- Peck, S. (1998). *Planning for biodiversity: Issues and examples*. Washington, D.C.: Island Press.
- Pothukuchi, K., & Kaufman, J. L. (2000). The food system: A stranger to the planning field. *Journal of the American Planning Association*, 66(2), 113–124.
- Prater, C., & Lindell, M. K. (2000, May). Politics of hazard mitigation. *Natural Hazards Review*, 1(2), 73–82. [http://dx.doi.org/10.1061/\(ASCE\)1527-6988\(2000\)1:2\(73\)](http://dx.doi.org/10.1061/(ASCE)1527-6988(2000)1:2(73))
- Raja, S., Ma, C., & Yadav, P. (2008). Beyond food deserts: Measuring and mapping racial disparities in neighborhood food environments. *Journal of Planning Education and Research*, 27(4), 469–482. <http://dx.doi.org/10.1177/0739456X08317461>
- Roberts, P. (2006). Evaluating regional sustainable development: Approaches, methods and the politics of analysis. *Journal of Environmental Planning and Management*, 49(4), 515–532. <http://dx.doi.org/10.1080/09640560600747786>
- San Francisco Department of Public Health. (2010). *Healthy development measurement tool*. Retrieved from <http://www.thehdm.org/>
- Sowman, M., & Brown, A. L. (2006). Mainstreaming environmental sustainability into South Africa's integrated development process. *Journal of Environmental Planning and Management*, 49(5), 695–712. <http://dx.doi.org/10.1080/09640560600849988>
- Srivastava, R., & Laurian, L. (2006). Natural hazard mitigation in local comprehensive plans: The case of flood, wildfire and drought planning in Arizona. *Disaster Prevention and Management*, 15(3), 461–483. <http://dx.doi.org/10.1108/09653560610669936>
- State of Mississippi. (1972). *Mississippi Code of 1972 – Section 17-1*. Retrieved from Michie's Legal Resources website: <http://michie.com/mississippi/lpext.dll?f=templates&fn=main-h.htm&cp=>
- Tinker, I. (1995). The urban street food trade: Regional variations in women's involvement. In E. N. Chow & C. W. White (Eds.). *Women, the family, and policy: A global perspective*. Albany, New York: SUNY Press.
- Tinker, I. (1997). *Street foods: Urban food and employment in developing countries*. New York, New York: Oxford University Press.
- Wondolleck, J., & Yaffee, S. (2000). *Making collaboration work: Lessons from innovation in natural resource management*. Washington, D.C.: Island Press.
- Yaffee, S., & Wondolleck, J. (1997). Building bridges across agency boundaries. In K. A. Kohm & J. F. Franklin (Eds.). *Creating a forestry for the 21<sup>st</sup> century* (pp. 381–396). Washington, D.C.: Island Press.

## Appendix

**Table 1. Food Systems Evaluation Results**

Indicator	Biloxi	D'Iberville	Gulfport	Long Beach	Pass Christian	Pascagoula	Moss Point	Gautier	Ocean Springs	Waveland	Bay St. Louis	Harrison County	Hancock County	Jackson County
<b>A. Factual Basis</b>														
Recognition of the historical role of food systems in the community	1	1	0	0	0	1	0	0	0	1	0	2	1	1
Identification of physical areas used for agriculture and aquaculture	2	0	2	0	0	1	1	2	1	1	1	1	1	1
Identification of facilities for seafood processing	1	0	0	0	0	0	1	0	1	0	0	0	0	0
Identification of physical areas used for mariculture	0	0	0	0	1	1	0	0	1	0	0	1	1	0
Identification of water bodies	2	2	2	1	1	2	1	1	2	1	1	2	1	1
Identification of employment in agriculture, aquaculture, and mariculture industries	1	2	0	0	2	1	2	1	1	1	0	1	1	1
Identification of physical facilities that support agri/aqua/mariculture (such as boat launches, harbors, ports, rail)	1	0	2	1	2	1	2	1	2	0	1	2	1	1
Identification of social services that support food access	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Identification of food waste	0	0	0	0	0	0	1	0	0	0	0	0	0	0

Recognition of climate change and its potential impacts on the food system	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Recognition that food is a sustaining and enduring necessity	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recognition that food system activities take up a significant amount of land	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recognition that the food system represents an important part of regional economies	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recognition of the fossil fuel energy needed to produce, process, transport, and dispose of food	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recognition that water pollution adversely affects mariculture	1	0	0	0	0	2	0	0	0	0	0	0	0	0
Recognition that access to healthy foods in low-income areas is an increasing problem	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Promotion of a regional food system to create stronger communities	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Identification of preventable disease incidence (asthma, diabetes, heart disease, etc.)	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Proportion of population within 1 mile of a supermarket	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Proportion of retail food establishments that accept food assistance programs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Proportion of public schools with a school garden	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Density of fast food outlets	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Proportion of households within 1 mile of a farmers' market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Proportion of households within 1 mile of a community garden, CSA, or other food source	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Score for Factual Basis</b>	<b>9</b>	<b>5</b>	<b>6</b>	<b>2</b>	<b>6</b>	<b>9</b>	<b>8</b>	<b>5</b>	<b>9</b>	<b>4</b>	<b>3</b>	<b>14</b>	<b>7</b>	<b>5</b>
<b>Total Percentage Score for Factual Basis</b>	<b>18.8%</b>	<b>10.4%</b>	<b>12.5%</b>	<b>4.2%</b>	<b>12.5%</b>	<b>18.8%</b>	<b>16.7%</b>	<b>10.4%</b>	<b>18.8%</b>	<b>8.3%</b>	<b>6.3%</b>	<b>29.2%</b>	<b>14.6%</b>	<b>10.4%</b>
<b>B. Goals and Objectives</b>														
Creating a sustainable and more self-reliant community and regional food system	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Supporting food systems that are ecologically sustainable	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Supporting food systems that improve the health of the region's residents	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Supporting food systems that are equitable and just	0	0	0	0	0	0	0	0	0	0	0	2	0	0

Strengthening the local and regional economy by promoting local and regional food systems	2	0	0	0	0	0	0	0	0	0	0	2	0	0
Concentrating growth away from agriculture	0	0	0	0	0	0	0	2	0	0	0	0	2	0
Supporting the development of facilities that support the food system	0	0	2	0	0	1	0	0	0	0	2	0	0	0
<b>Total Score for Goals and Objectives</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>0</b>
<b>Total Percentage Score for Goals and Objectives</b>	<b>14.3%</b>	<b>0.0%</b>	<b>14.3%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>7.1%</b>	<b>0.0%</b>	<b>14.3%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>21.4%</b>	<b>42.9%</b>	<b>14.3%</b>	<b>0.0%</b>
<b>C. Policies, Tools, and Strategies</b>														
Encouraging community gardens	1	0	0	0	0	0	0	0	0	0	0	2	0	2
Establishing urban growth boundaries to exclude food-growing areas	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Targeting growth away from food sources	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Making capital improvements	2	2	2	2	2	1	2	2	0	2	2	2	2	1
Establishing conservation zones or overlay districts	0	0	0	0	1	2	2	0	0	1	0	2	2	1
Establishing buffer requirements	0	0	0	0	1	2	2	0	1	0	0	0	0	1
Identifying commercial districts (where restaurants and grocery are located)	1	0	0	0	1	1	0	0	0	0	0	2	0	0

Encouraging Main Street programs (to support mom-and-pop enterprises)	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Establishing transit options connecting low-income areas with supermarkets	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offering technical assistance to food producers to avoid adverse impacts on water	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offering educational facilities and/or programming to support food systems education	0	0	1	0	0	0	0	0	0	0	1	0	0	0
Building or rebuilding farmers' markets	0	0	0	0	0	0	2	0	0	0	2	2	1	0
Encouraging urban and/or suburban agriculture	1	0	0	0	0	0	0	0	0	0	0	2	0	0
Regulating land use to support working waterfronts	1	0	0	0	0	0	0	0	0	0	0	2	2	0
Establishing a local food purchasing policy	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Creating a food vendor cart ordinance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Establishing a transfer of development rights program	1	0	2	2	2	0	0	0	0	0	0	0	0	0
Encouraging cluster development	2	1	1	0	0	2	1	2	1	2	2	2	2	1

Offering storm water management credit for providing agricultural land on site	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offering incentives for green roofs for urban agriculture	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Offering extra credit for fruit trees as part of landscaping requirements	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Offering incentives for community supported agriculture operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Restricting fast food restaurants	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Allowing fruit and vegetable carts on sidewalks	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Score for Policies, Tools, and Strategies</b>	<b>9</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>4</b>	<b>2</b>	<b>5</b>	<b>7</b>	<b>24</b>	<b>9</b>	<b>6</b>
<b>Total Percentage Score for Policies, Tools, and Strategies</b>	<b>16.7%</b>	<b>5.6%</b>	<b>11.1%</b>	<b>7.4%</b>	<b>13.0%</b>	<b>14.8%</b>	<b>16.7%</b>	<b>7.4%</b>	<b>3.7%</b>	<b>9.3%</b>	<b>13.0%</b>	<b>44.4%</b>	<b>16.7%</b>	<b>11.1%</b>
<b>Total Normalized Percentage Score Across All Categories</b>	<b>16.6%</b>	<b>5.3%</b>	<b>12.6%</b>	<b>3.9%</b>	<b>8.5%</b>	<b>13.6%</b>	<b>11.1%</b>	<b>10.7%</b>	<b>7.5%</b>	<b>5.9%</b>	<b>13.5%</b>	<b>38.8%</b>	<b>15.2%</b>	<b>7.2%</b>

## Incorporating policies for a healthy food system into land use planning: The case of Waterloo Region, Canada

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### Abstract

Land use planning is a critical tool among the strategies needed to redirect our food system into a new trajectory toward improved health, environmental sustainability, and small to midsize farm viability. We present the case of the region of Waterloo, Ontario, Canada, where recent revisions to the Regional Official Plan (ROP) now include a suite of specific land use policies related to food.

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What characterizes food systems planning in Waterloo is the inclusion of both rural and urban land use policies, and close collaboration between the Planning and Public Health departments. This article documents the context in which this partnership took shape, the process of information gathering and community consultation, and the specific food-related policies that were included in the ROP. The relevance of these policies to the local produce auction, community markets, community gardens, and on-farm stores illustrates how policy emerges from practice, and also suggests that policy work is an ongoing work in progress.

### Keywords

Canada, farm viability, food policy, food system planning, healthy food access, land use planning, local food system, public health, official plan, Waterloo Region

### Introduction

Land use planning is a critical tool among the strategies needed to redirect our food system into a new trajectory toward improved health, environmental sustainability, small to midsize farm viability, and community engagement. Inequality and

deterioration in these areas have been broadly documented and have led to a growing recognition of the need for policy change, including the consideration of food-related issues when planning our urban communities. This has prompted increased awareness and involvement among professional urban planners in initiatives that aim to systemically revitalize local food chains (Campbell, 2004; Kaufman, 2009; Nichol, 2003; Pothukuchi & Kaufman, 1999). Changing existing land use policies that support food systems is never simple. It requires knowledge of the existing regulatory structure and is fraught with tensions between commercial and public interests, which are often not clear-cut. This work is therefore politically sensitive in nature and requires cooperation with and input from relevant stakeholders. It also needs evidence and data on which to base planning decisions. Time intensive as this process might be, it can be seen as a valuable opportunity for enhancing understanding of the local food system and building support among citizens, politicians, and rural and urban planners — thus creating a foundation for ongoing systemic change.

We present here the case of the region of Waterloo, Ontario, Canada, where revisions to the Regional Official Plan (ROP) included, for the first time in a Canadian context, a suite of specific land-use policies related to food (Region of Waterloo, 2010a). There are numerous examples of basic support for the production, processing, and retail of locally grown food embedded in official or comprehensive plans throughout Canada and the USA (Canadian Institute of Planners, 2010; Raja, Born, & Purcell, 2008). For instance, the Toronto Official Plan promotes the creation of community gardens and reducing loss of foodlands to urban sprawl (City of Toronto, 2009, pp. 1–5; Wekerle, 2004). However, planning policies that prescribe rather than just promote such efforts are more rare. They can be enshrined at the “macro level” in provincial or regional government official plans, which then allows local municipalities to implement food-related policies at the “mid- and micro-levels” by passing and enforcing detailed zoning regulations (Oswald, 2009). Examples in Canada of macro-level policies include the new

Manitoba Planning Act, which directs and guides municipalities to designate allowable sizes and locations of livestock operations in their local land use plans (Grift, 2009); and the Ontario Provincial Policy Statement (PPS), which requires local municipalities to establish criteria for farmers wishing to produce value-added farm products from their farm operations (Ontario Ministry of Municipal Affairs and Housing, 2005). An example of a micro-level policy is any local municipal bylaw that would permit a neighborhood market selling locally grown food (Maan Miedema, 2008; Raja et al., 2008, pp. 23–26).

What has uniquely characterized food systems planning in Waterloo is the inclusion of both rural and urban land use policies, and close collaboration between the Planning and Public Health departments. This article documents the context in which this partnership took shape, the process of information gathering and community consultation, and the specific land use policies that were included in the ROP. The relevance of these policies to initiatives such as the local produce auction, community markets, community gardens, and on-farm stores illustrates how policy emerges from practice, but also suggests that policy work is an on-going work in progress.

#### *The Context: A Midsized Rural-Urban Community*

The region of Waterloo is located approximately 62 miles (100 km) west of Toronto, and is part of a larger economic region in Ontario known as the “Greater Golden Horseshoe.” The region consists of three cities, Kitchener, Waterloo, and Cambridge, and four rural townships that contain several smaller towns and villages. With a population of just over half a million people (the tenth largest urban area in Canada), it has a mix of small-town qualities as well as big city amenities, including two universities and several leading-edge technology companies such as Research in Motion (RIM).

Waterloo Region, situated between the Great Lakes, has always had a vibrant and productive agricultural sector because it has some of the highest quality farmland in Canada. A unique

contribution to the region's strong rural economy comes from the large concentration of Mennonite and Amish people, whose way of life and farming practices explain the greater number of smaller, mixed farms in the region compared to elsewhere in Ontario.

#### *Concerns About Health and Urban/Rural Development*

Shortly into the new millennium, the Waterloo Region Planning Department and Public Health Department were both engaged in operational planning that saw their issues converge. Planners were preparing a new Growth Management Strategy and revised Official Plan, while Public Health had established a new Health Determinants division which was striving to improve contextual influences — social, economic and environmental — on health. Basically, the issues of concern were threefold:

#### ***Strong Urban Growth, but Health and Environmental Issues:***

Given its location and economy, Waterloo Region is one of the fastest growing urban areas in the country. Over the next 20 years, the population is projected to grow by about 40%, to over 700,000 people. Although growth has positive benefits, it also presents several challenges. Like the majority of North American cities, much residential growth is occurring in suburban areas that are isolated from where people work and shop. Not only does this pattern of growth consume valuable farmland, but it also contributes to increased levels of car use, air pollution, and greenhouse gas emissions. Recent studies have linked these planning issues to health problems such as obesity, diabetes, and asthma (Abelsohn, Bray, Vakil, & Elliott, 2005).

#### ***Agricultural Importance to the Economy, but Rural Decline:***

A consultant provided data that showed the significance of the farm sector to the Waterloo Region economy: in 2002 it supported about 3,450 full-time jobs, or 11.3% of the region's total labor force (Cummings, H. & Associates Inc., 2003). As well, each agricultural job supports four additional jobs in the local economy, and each dollar of sales in the agricultural sector generates an

extra CA\$2.40 of sales in the local economy. Yet farm incomes and the number of smaller farms in the region were in decline, leading to stress in rural communities due to the resultant reduction in schools, services, and businesses, despite the strong resiliency of residents (Zupko, Shearer, & Vermeulen, 2004).

#### ***Abundance of Rich Farmland, but Inadequate Diet at the Population Level and Insufficient Access to Healthy Food:***

As early as 2000, Public Health in Waterloo Region had begun thinking about the food system as a determinant of health, with social, economic, and environmental dimensions (Desjardins & Xuereb, 2005). For example, in 2003 over half (58%) its residents were consuming insufficient servings of fruits and vegetables, and half the population was either overweight or obese (Statistics Canada, 2004). Public Health recognized that the growing incidence of diet- and weight-related chronic diseases was determined in part by the types of food available to people where they live, work, and study. Unhealthy foods were becoming more convenient and affordable, farm-direct markets were not accessible to everyone, and food retailing had declined in urban core areas. At the same time, farmers had limited opportunities for selling their produce and other local foods, both in the country and the city (Soots, 2003). From a policy perspective, therefore, it made sense to adopt a food system approach in addressing the range of seemingly disconnected food issues. Not only would this approach help improve access to locally grown food and contribute to the dietary health of the population, but it would also improve rural viability and prosperity (Buzby, 2006; CDC, 2009; Hawkes, 2007; Lang, Barling, & Caraher, 2009; McCullum, 2004). It illustrates the value of transdisciplinary cooperation in beginning to address inequities in various dimensions of the food system (Wallerstein, Yen, & Syme, 2011).

The need for a more integrated policy approach led to collaborations between Public Health staff and urban planners. Arguing for the potential for improving health, the environment, social equity, and the economy through land use planning policies, Public Health advocated successfully for food

system planning to be part of the Growth Management Strategy, which was being led by the Planning Department. The creation of a food system plan for Waterloo Region became one of over 80 projects authorized by Regional Council in 2003 to implement the goals of the Growth Management Strategy.

*Community Food System Assessment*

To inform the food system plan, Public Health used two types of methodologies. First, Public Health staff and an external consultant were assigned to prepare a number of background research studies to build a database about various aspects of the Waterloo Region food system (table 1). These reports consisted, for the most part, of primary data gathered from sources in Waterloo Region, as well as analyses of that data to calculate indices such as food miles and indicators of redundant trade. The advisory committee included planning staff, farmers, and food industry representatives, who advised on data collection and helped interpret the data. Second, after data had been compiled and distilled into a set of recommended actions, Public Health held a series of 11 focus groups to determine the priorities and commitments of various stakeholder groups regarding those actions.

Some of the reports in table 1 were presented to regional councilors for their information, and all were published on the region’s website. These were good opportunities for bringing diverse aspects of the food system to the attention of councilors, planners, and the public. Highlights of a selection of four of these reports follow.

**Food Flow Study:** To determine how much of the food consumed in Waterloo Region was grown or raised there, consultants picked a representative basket of 20 commonly consumed foods which are also produced locally, including ground beef, cheddar cheese, quick

oatmeal, carrots, tomatoes, and strawberry jam. They picked random samples of these foods in supermarkets and traced them back to their sources. While some of those foods originated from Ontario, the majority were rarely or not sourced from Waterloo Region. The region’s food system is heavily invested in global trade: for example, much of its beef goes to processing plants to be made into frozen burger patties for export, while a considerable amount of fresh meat is imported from Alberta and New Zealand (Cummings, H., & Associates Inc., 2005).

**Redundant Trade Study:** Public Health staff conducted a series of grocery store and farmers’ market audits (including measurement of shelf space) in order to determine the extent to which imported produce was available during the peak season of local produce. The analysis showed it to be considerable. For example, in June, 5% of in-store displays sold region of Waterloo strawberries, while 73% sold Ontario strawberries and 22% sold strawberries imported from the U.S. (Maan Miedema, 2005).

**Food Miles Study:** This environmental impact study looked at a set of 58 commonly consumed foods grown or raised in Waterloo Region, and cal-

**Table 1. Food System Reports by Region of Waterloo Public Health\***

Growing Food and Economy Study	2003
Rural Health Study	2003
Diet, Weight and Diabetes	2004
Food Access Study	2004
Local Food Buying in Waterloo Region	2004
Optimal Nutrition Environment Study	2005
Marketing & Branding of “Buy Local Buy Fresh”	2005
Urban Agriculture Report	2005
Food Flow Analysis Study	2005
Food Miles Study	2006
Redundant Trade Study	2006
Towards a Healthy Community Food System in Waterloo Region	2005
Food System Plan for Waterloo Region	2007
Neighborhood Markets Evaluation	2008

\* Waterloo Region Public Health Food Reports are available at [www.region.waterloo.on.ca/ph](http://www.region.waterloo.on.ca/ph) (Research Studies/Food).



culated the number of miles travelled by *imports* of these same types of foods. On average, these imports travelled almost 2,800 miles (4,500 km), and together generated over 51,000 tons of greenhouse gas emissions annually (Xuereb, 2005).

***Optimal Nutrition Environment Study:*** This study estimated the quantity of locally grown vegetables, fruits, legumes, and whole grains needed to help meet the region of Waterloo population's optimal nutritional requirements in 2006 and as projected in 2026. The study further estimated how much of these healthy food requirements could realistically be produced through local agriculture by the year 2026. Analysis showed that a shift of approximately 10% of currently cropped hectares to the production of key nutritious food crops would be both agriculturally feasible and nutritionally significant to the population. This study was later published (Desjardins, MacRae, & Schumilas, 2010), and adapted for the city of Toronto (MacRae et al., 2010).

#### *Discussion Paper: Towards a Healthy Community Food System in Waterloo Region*

In October 2005, Public Health published a report that summarized the findings of the background studies and related literature, and proposed seven strategic objectives to move toward the goal of a healthy food system, one in which “all residents have access to, and can afford to buy safe, nutritious, culturally acceptable food that has been produced in an environmentally sustainable way and that sustains our rural communities” (Desjardins & Xuereb, 2005, p. 4). Four land use-related objectives were included: to preserve Waterloo Region's farmland, to increase availability of healthy food, to increase the viability of farms, and to strengthen the local food economy (Desjardins & Xuereb, 2005).

#### *Consultations with Food System Stakeholders*

To test how the proposed food system strategies resonated with the community and to gauge their buy-in toward the goals, in early 2006 Public Health invited stakeholders from different groups — farmers, land use planners, technical advisors (including staff from the Ontario Federation of

Agriculture and the Ontario Ministry of Agriculture and Food), Old Order Mennonite producers, restaurant owners, food retailers, institutional food buyers, and consumers — to participate in 11 focus groups.

Qualitative analysis of the consultation data revealed many specific actions, out of which six were highlighted and presented back to participants in a follow-up forum in June 2006. These actions, plus a seventh one, were consequently accepted as priorities: (1) promote local food, (2) pilot mobile farmers' markets, (3) examine the feasibility of farm-to-institution programs, (4) expand the labeling of local food, (5) address zoning issues for farming, (6) investigate incubator kitchens, and (7) create a new body to oversee the plan. This work was later summarized in the document, *A Healthy Community Food System Plan for Waterloo Region* (Maan Miedema & Pigott, 2007).

The consultation process was not only extremely informative, but also served to engage stakeholders in thinking about their role in the food system as a whole. In addition, it gave legitimacy to the goals proposed in the *Food System Plan* and lent population-based support to the land use policies that were later built into the ROP. Thus, the overall process represented the transformation of local food and agriculture data into a set of clear strategies, with public and professional input as a catalyst. The next step was to turn these strategies into policies and community-centered actions.

#### **Result: Projects and Policies That Support a Healthy Food System**

##### *Waterloo Region Food System Roundtable*

The seventh action mentioned above was a recognition that the identified priority actions were beyond the mandates of Public Health and Planning, and would require a body of people representative of the key interests and sectors of the food system to oversee the new food system plan. Consequently, after a year of organizational planning, the Waterloo Region Food System Roundtable was inaugurated late in 2007. It consisted of 18 representatives from key sectors

and interests of the food system (planners, farmers, food manufacturers and distributors, restaurant owners, health professionals, food poverty advocates, researchers, etc.). Financial and staff support was provided through the Public Health Department.

The Roundtable has now assumed the role of overseeing the implementation of the 2007 *Food System Plan* mentioned above. It seeks to engage the community in discussions, to support food-related policy development, and to facilitate networking among existing food groups and stakeholders. To date, it has achieved these objectives through regular meetings, public forums, letters of support for local projects, and a website designed to enable networking and discussion among people on food issues. A day-long community food summit in 2009 resulted in naming six priorities — food sovereignty, food policy, urban agriculture, local food infrastructure, farm viability, and access to healthy food — as well as a Summit Declaration.<sup>1</sup> Significantly, the Roundtable was able to provide input into and support for food-related policies in drafts of the ROP, via two letters and presentations to Regional Council.

#### *Food-Related Policies in the 2009 Waterloo Region Official Plan*

The new ROP, adopted by Regional Council in June 2009, includes an entirely new section, “Access to Locally Grown and Other Healthy Foods” (appendix, figure 1), which was drawn up by planners and reviewed by staff from Public Health. This section includes a preamble that clearly sets out the region’s interest in food system planning, explaining what the region is trying to achieve. Significantly, it adds new food-related policies into the sections on general development policies and transit-oriented development. Details on specific ROP food-related policies, and how some of them came into being, are as follows:

***Countryside Line:*** For a strong and sustainable food system, urban sprawl must be contained in order to protect our most valuable farm land. To that end, planners proposed a hard-edge urban growth boundary in the new Official Plan called the “Countryside Line.” Unlike traditional urban boundaries in Ontario, the Countryside Line defines the long-term, and in some cases, ultimate, limits of urban growth in the region. Of all the policies, this has been perhaps the most difficult to implement. At first, planners were contemplating a permanent urban growth boundary around the region. Eventually, through the approval process, the Countryside Line became a permanent urban boundary in some locations, and a “long-term” boundary in others. The map in figure 2 (next page) shows the position of the Countryside Line as it was approved by Council in 2009.<sup>2</sup>

***Elmira Produce Auction:*** This is an example of a private-sector initiative that required some new ways of thinking for the land use planners who reviewed its application. In 2003, a group of Old Order Mennonite farmers asked for a rural building permit to establish a produce auction where farmers could sell wholesale quantities of their produce cooperatively. The internal rules of the auction’s operators permitted only growers within a 47 mile (75 km) radius of the town of Elmira to sell their products at the auction. This limit was intended to support local farm incomes by encouraging diversification into higher value crops such as seasonal fruit and produce. Sellers range from hobby gardeners to large produce operations. Some farmers use the auction to offload surplus crops, while others see it as a reliable sales outlet for their products. Public Health and Planning staff were excited by the prospect of establishing one of the missing links in the local food system: a one-stop place for urban retailers to access locally grown food.

The establishment of this commercially related land use, however, normally would not have been permitted in an agricultural zone under a strict

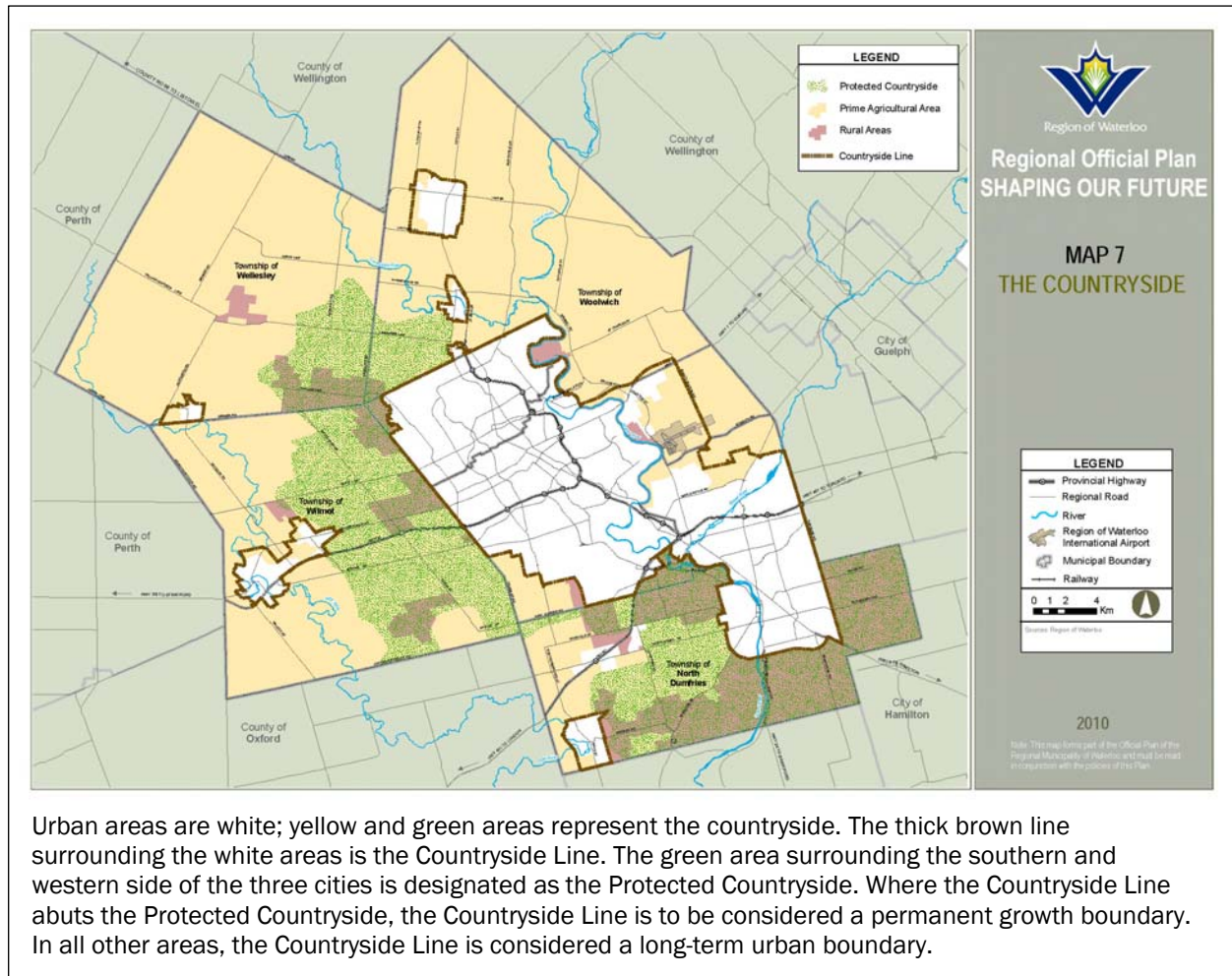
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<sup>1</sup> The Declaration of the Waterloo Region Food Summit (2009) can be accessed at [http://www.wrfoodsystem.ca/files/www/FOOD\\_SUMMIT\\_DECLARATION.pdf](http://www.wrfoodsystem.ca/files/www/FOOD_SUMMIT_DECLARATION.pdf)

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<sup>2</sup> As of the writing of this article, this and other sections of the ROP are under appeal by various parties to the Ontario Municipal Board. A decision is not expected until at least 2012.

**Figure 2. The Countryside Line, Waterloo Region Official Plan**



Urban areas are white; yellow and green areas represent the countryside. The thick brown line surrounding the white areas is the Countryside Line. The green area surrounding the southern and western side of the three cities is designated as the Protected Countryside. Where the Countryside Line abuts the Protected Countryside, the Countryside Line is to be considered a permanent growth boundary. In all other areas, the Countryside Line is considered a long-term urban boundary.

interpretation of the township’s<sup>3</sup> zoning bylaw. Nevertheless, after consulting with Regional staff about the many benefits of the auction to local farmers and the food system, the township eventually supported it through a zoning bylaw amendment. Initially, the auction was approved as a temporary “agriculture-related use” that could be renewed every three years, but it was soon made permanent. Produce auctions have since been added as a permitted agriculture-related use under the region of Waterloo’s new Official Plan.

**Better Support for On-Farm Business:** Regarding farm viability, one of the key messages Public

<sup>3</sup> Elmira is in Woolwich Township, one of Waterloo Region’s seven area municipalities.

Health heard from farmers in the 2006 public consultations was that simply saving farmland was not enough to keep them on the land; they also needed to be allowed to diversify their on-farm income. Planners reviewed existing agricultural policies, but were concerned that relaxing the goal of keeping the countryside dedicated to farming might open the door to the proliferation of inappropriate commercial uses across the countryside. Therefore, they drafted new policy in a way that supports on-farm business, but at the same ensures that it remains small-scale and secondary to, but compatible with, surrounding farm operations.

An example of allowing such on-farm business was a beef farm in the township of North Dumfries. Thirteen years earlier, when the mad cow disease

crisis hit Canada, the family decided to sell its herd as freezer beef, starting with one freezer in the garage. Unexpectedly, the popularity of their products grew, leading them to network with neighboring farmers to diversify their line of local food products. Their business grew to the point where it became viable to build a store on their farm to serve as a retail hub for neighboring farms. Ultimately the family received approval from the township to construct a small store to sell food from neighboring farms, including fresh produce, dairy products, and home baked items, in addition to their own grass-fed Black Angus beef. They added an in-store kitchen to generate value-added food products from the farm, and now employ several workers. In 2009, their efforts were recognized with a Premier's Award for Agri-Food Innovation Excellence. From a land use policy perspective, the township was able to support the retail/commercial aspect of this farm operation because the store was small in scale, secondary to the farm operation and helped support the local farm community. Establishing such criteria in municipal planning documents can help remove the zoning barriers farmers face in starting on-farm businesses.

**Neighborhood Markets:** In 2007, Public Health received a grant for a two-year pilot program to establish neighborhood produce markets in areas with limited food availability. The markets aimed to increase access to healthy food and at the same time support local farmers (Maan Miedema, 2009). They faced a challenge, as municipal zoning bylaws did not permit such market operations in the locations where Public Health proposed to put them, and licensing fees were prohibitively expensive considering their small scale. However, the local municipal planners saw that the Regional government was promoting the idea as part of its council-approved *Food System Plan*, which led them to permit the markets because they were a “public service.” One of the first neighborhood markets, in the hospital parking lot at St. Mary's Hospital in Kitchener, won a Health Promotion Innovation award from the Ontario Ministry of Health and Long-Term Care for its produce market. The region subsequently added a new policy to its ROP,

approved in 2009, that requires area municipalities to establish policies that permit temporary farmers' markets “wherever appropriate.” It defined temporary farmers' markets as “outdoor food stands using temporary structures to sell food products to the public...primarily from local sources” (Region of Waterloo, 2010, p. G-19). Three of these neighborhood markets, now independently operated, continue to this day. One neighborhood market, operated by community organizations in the City of Cambridge, was the first to receive permission to operate without the intervention of the region after the implementation of the new ROP provisions.

**Urban Agriculture:** The region's Public Health Department has been supporting a network of over 40 community gardens in the region for several years (Mazereeuw, 2005). The number has continued to grow, but some gardens have faced obstacles such as acquiring land and resources to start and maintain them — issues within the purview of municipalities. The ROP incorporated policies to enable community gardens by granting access to region-owned lands, and by providing forms of in-kind support such as rain barrels, composting bins, compost, and wood mulch. With this official support, at least one new community garden has been approved on region-owned lands.


## Discussion

In retrospect, it is clear that the process of incorporating food-related policies — both rural and urban — into the Waterloo ROP has emphasized the roles of collaboration and thorough research in order to build the requisite political will. To date, the ROP was approved by the province of Ontario, but still faces appeals from some parties. Such inherent complexity may be a reason why, in general, community-engaged food system planning that aims to improve population health and small to midsize farm viability has been slow in coming, in addition to the reasons noted by Pothukuchi and Kaufman (2004) and Clancy (2004). In a survey of planners in Ontario that served as the basis for the recent food-related document *A Call to Action* (Ontario Professional Planners Institute, 2011), only 15% of Ontario planners reported significant

involvement in food issues, but 61% said they would like to be more involved. Setting the stage, the case of developing food policy in Waterloo Region has highlighted the merit of a synergistic partnership between Public Health, Planning, and food system stakeholders to build a rationale and process for change.

Time will tell whether these policies will have the desired effects and in what ways they will influence actions in both urban and rural areas. This points to the importance of monitoring the social, economic, agricultural, and developmental outcomes and challenges that result from implementing food policies in the ROP. A key component to monitor is change to the food environment, for which precise indicators are required. Wegener has noted the significance of assessing the “alternative” food retail environment, such as farm stores, farmers’ markets, and mobile produce stands, suggesting that “zoning designations to enable the establishment and expansion of these outlets could make an important contribution to improving the availability and accessibility of health-promoting foods” (2009, p. 47). Research by Minaker, Fisher, and Raine (in press) intends to develop standard measures of the food environment that are shown to be associated with diet and health, and that will be useable and feasible to implement by municipalities, urban planners, and developers. These activities accentuate the value of a research partner in the on-going pursuit of effective policy development, a role for which interested university programs are ideally suited.

Overall, the current Waterloo ROP should be seen as a starting point. There will be unforeseen outcomes due to shifting social circumstances, new information, and the uncertain nature of political processes. This overall reality makes the issues and opportunities unique to every region, leading to parallel — but different — land use policy developments that are currently in progress in other jurisdictions throughout North America. In Ontario, there is a need for a coordinated policy framework, within the Provincial Policy Statement, for land use planning that promotes access to healthy food for consumers as well as food-related

enterprises that can improve regional farm viability and sustain farm land. To make this happen, it will be essential to share information regularly among planners and other stakeholders across different regions, and to collectively identify common strategic threads and standards that work. Thanks to greater participation of planners in creating food-based land use policies, the healthy food system snowball has started to roll. 

## References

- Abelsohn, A., Bray, R., Vakil, C., & Elliott, D. (2005). *Report on public health and urban sprawl in Ontario: A review of the pertinent literature*. Environmental Health Committee, Ontario College of Family Physicians. Retrieved from <http://www.ocfp.on.ca/docs/public-policy-documents/urbansprawl.pdf>
- Buzby, J. D., Wells, H. F., & Vocke, G. (2006). *Possible implications for U.S. agriculture from adoption of select dietary guidelines*. Economic Research Service, USDA. Economic Research Report No. 31. Retrieved from <http://www.ers.usda.gov/publications/err31>
- Campbell, M. C. (2004). Building a common table: The role of planning in community food systems. *Journal of Planning Education and Research*, 23(4), 341–355. <http://dx.doi.org/10.1177/0739456X04264916>
- Centers for Disease Control and Prevention (CDC). (2009). *State indicator report on fruits and vegetables 2009*. Retrieved from <http://www.fruitsandveggiesmatter.gov/downloads/StateIndicatorReport2009.pdf>
- City of Toronto. (2009). *Toronto Official Plan*. Retrieved from [http://www.toronto.ca/planning/official\\_plan/introduction.htm](http://www.toronto.ca/planning/official_plan/introduction.htm)
- Clancy, K. (2004). Potential contributions of planning to community food systems. *Journal of Planning Education and Research*, 23(4), 435–438. <http://dx.doi.org/10.1177/0739456X04264893>
- Cummings, H., & Associates Inc. (2003). *Growing food and economy: Economic impact study of the agriculture and food-related sectors in Waterloo Region*. Region of Waterloo Public Health. Retrieved from <http://chd.region.waterloo.on.ca/en/research/ResourcesPublications/resources/FoodEconomyStudy.pdf>

- Cummings, H., & Associates Inc. (2005). *Region of Waterloo food flow analysis study*. Region of Waterloo Public Health. [http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/FoodFlow\\_Analysis.pdf](http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/FoodFlow_Analysis.pdf)
- Desjardins, E., MacRae, R., & Schumilas, T. (2010). Linking future population food requirements for health with local production in Waterloo Region, Canada. *Agriculture and Human Values*, 27(2), 129–140. <http://dx.doi.org/10.1007/s10460-009-9204-y>
- Desjardins, E., & Xuereb, M. (2005). *Towards a healthy community food system for Waterloo Region*. Region of Waterloo Public Health. Retrieved from [http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/FoodSystems\\_Report.pdf](http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/FoodSystems_Report.pdf)
- Grift, S. (2009). Planning for sustainable livestock and agricultural development in Manitoba. *Plan Canada*, 49(2), 21–23.
- Hawkes, C. (2007). Promoting healthy diets and tackling obesity and diet-related chronic diseases: What are the agricultural policy levers? *Food and Nutrition Bulletin*, 28(2), S312–S322.
- Kaufman, J. L. (2009). Food system planning: Moving up the planner's ladder. *Plan Canada*, 49(2), 12–16.
- Lang, T., Barling, D., & Caraher, M. (2009). *Food policy: Integrating health, environment and society*. Oxford, UK: Oxford University Press.
- Maan Miedema, J. (2009). *Neighbourhood markets: Outcome evaluation*. Region of Waterloo Public Health. Retrieved from [http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/NM\\_Evaluation.pdf](http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/NM_Evaluation.pdf)
- Maan Miedema, J. (2006). *A study of redundant trade in Waterloo Region*. Region of Waterloo Public Health. Retrieved from [http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/Redundant\\_Trade.pdf](http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/Redundant_Trade.pdf)
- Maan Miedema, J., & Pigott, K. (2007). *A healthy community food system plan for Waterloo Region*. Region of Waterloo Public Health. Retrieved from [http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/FoodSystem\\_Plan.pdf](http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/FoodSystem_Plan.pdf)
- MacRae, R., Gallanta, E., Patel, S., Michalak, M., Bunch, M., & Schaffner, S. (2010). Could Toronto provide 10% of its fresh vegetable requirements from within its own boundaries? Matching consumption requirements with growing spaces. *Journal of Agriculture, Food Systems and Community Development*, 1(2), 105–127. <http://dx.doi.org/10.5304/jafscd.2010.012.008>
- Mazereeuw, B. (2005). *Urban agriculture report*. Region of Waterloo Public Health. Retrieved from <http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/UrbanAgriculture.pdf>
- McCullum, C. (2004). Using sustainable agriculture to improve human nutrition and health. *Journal of Community Nutrition*, 6(1), 18–25.
- Mendes, W. (2007). Negotiating a place for “sustainability” policies in municipal planning and governance: The role of scalar discourses and practices. *Space & Polity*, 11(1), 95–119.
- Minaker, L. M., Fisher, P., & Raine, K. D. (In press). Measuring food retail access: From theory to planning practice. *Journal of Agriculture, Food Systems and Community Development*. <http://www.AgDevJournal.com>
- Nichol, L. (2003). Local food production: Some implications for planning. *Planning Theory & Practice*, 4(4), 409–427. <http://dx.doi.org/10.1080/1464935032000146264>
- Ontario Ministry of Municipal Affairs and Housing. (2005). *Ontario Provincial Policy Statement*. Retrieved from <http://www.mah.gov.on.ca/Page215.aspx>
- Ontario Professional Planners Institute. (2011). *Healthy communities and planning for food: Planning for food systems in Ontario: A call to action*. Retrieved from [http://www.ontarioplanners.on.ca/%5Cpdf%5Call to action from oppi june 24 2011.pdf](http://www.ontarioplanners.on.ca/%5Cpdf%5Call%20to%20action%20from%20oppi%20june%2024%202011.pdf)
- Oswald, J. (2009). Planning for urban agriculture. *Plan Canada (Canadian Institute of Planners)*, 49(2), 35–38.
- Pothukuchi, K., & Kaufman, J. L. (1999). Placing the food system on the urban agenda: The role of municipal institutions in food systems planning. *Agriculture and Human Values*, 16(2), 213–224. <http://dx.doi.org/10.1023/A:1007558805953>
- Raja, S., Born, B., & Russell, J. K. (2008). *A planner's guide to community and regional food planning: Transforming food environments, facilitating healthy eating*. Chicago, Illinois: American Planning Association.
- Region of Waterloo. (2010). *Regional Official Plan Documents [Glossary]*. Retrieved from <http://www.regionofwaterloo.ca/en/regionalGovernment/PreviousROP.asp>

- Soots, L. K. (2003). *Home Grown: Local Food System Development in Waterloo Region*. (Unpublished master's thesis). University of Waterloo, Department of Environment and Resource Studies, Waterloo, Ontario.
- Statistics Canada (2004). Canadian Community Health Survey, Cycle 1.1, 2000/01. Retrieved from <http://www.statcan.gc.ca/concepts/health-sante/index-eng.htm>
- Wallerstein, N. B., Yen, I. R., & Syme, L. S. (2011). Integration of social epidemiology and community-engaged interventions to improve health equity. *American Journal of Public Health*, 101(5), 822–830. <http://dx.doi.org/10.2105/AJPH.2008.140988>
- Wegener, J. (2009). “Alternative” food outlets and their relevance to policy and planning decisions. *Plan Canada (Canadian Institute of Planners)*, 49(2), 46–48.
- Wekerle, G. R. (2004). Food justice movements: Policy, planning, and networks. *Journal of Planning Education and Research*, 23(4), 378–386. <http://dx.doi.org/10.1177/0739456X04264886>
- Xuereb, M. (2005). *Food miles: Environmental implications of food imports to Waterloo Region*. Region of Waterloo Public Health. Retrieved from [http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/FoodMiles\\_Report.pdf](http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/FoodMiles_Report.pdf)
- Zupko, B., Shearer, J., & Vermeulen, K. (2004). *Rural health study in Waterloo Region: Final report 2004*. Region of Waterloo Public Health. Retrieved from [http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/RuralHealth\\_Study.pdf](http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/RuralHealth_Study.pdf)

## Appendix.

### Figure 1. Excerpts from Waterloo Region Official Plan

<http://www.region.waterloo.on.ca/newrop>

#### Chapter 3. Liveability in Waterloo Region

##### 3.F Access to Locally Grown and Other Healthy Foods

The regional food system consists of the chain of activities related to the production, processing, distribution, consumption and eventual disposal of food. A strong and diverse regional food system provides many benefits to the community. It facilitates peoples' access to locally grown and other healthy foods, which contributes to healthier eating choices and the achievement of broader public health objectives. It also encourages a range of food destinations within easy walking distance of where people live and work. Such a system helps shorten the distance that food travels and that people travel to buy food, thereby reducing the demand on transportation infrastructure and the growth in vehicle emissions. As well, a strong regional food system supports local farmers and contributes to the vitality and economic strength of rural communities and Waterloo Region as a whole. For these reasons, this Plan seeks to strengthen and diversify the regional food system.

3.F.1 The Region will support the development of a strong regional food system through the policies in this Plan that:

- (a) establish a Countryside Line to protect the countryside for long-term agricultural use;
- (b) permit a full range of agricultural uses, farm-related uses and secondary uses to support the economic viability of local farms;
- (c) provide for a mix of land uses, including food destinations, within close proximity of each other to facilitate residents' access to locally grown and other healthy food products; and
- (d) provide a range of human services including affordable housing, subsidized daycare, employment and income supports that seek to ensure all residents have adequate incomes to be able to afford to buy locally grown and other healthy food products.

3.F.2 Area Municipalities will establish policies in their official plans to permit temporary farmers' markets, wherever appropriate, in existing and newly planned neighborhoods, particularly in areas where access to locally grown food and other healthy food products may currently be limited.

3.F.3 Area Municipalities will establish policies in their official plans that encourage community gardens and rooftop gardens.

3.F.4 The Region will support community gardens, wherever feasible, by granting access to Regional lands, and by providing rain barrels, composting bins, compost, wood mulch or other forms of in-kind support.

3.F.5 The Region will collaborate with stakeholders to continue to implement initiatives supporting the development of a strong regional food system.

3.F.6 The Region supports food system planning as a means of improving the regional food system.

*(continued)*



## **Chapter 2. Shaping Waterloo Region's Urban Communities**

### **General Development Policies**

2.D.1 In preparing or reviewing planning studies, or in reviewing development applications or site plans, the Region and/or Area Municipalities will ensure that development occurring within the Urban Area is planned and developed in a manner that:

- ...
- (g) facilitates residents' access to locally grown and other healthy foods in neighborhoods;

### **Transit Oriented Development Policies**

2.D.2 In addition to the general development provisions described in Policy 2.D.1, the Region and Area Municipalities will apply the following Transit Oriented Development provisions in reviewing development applications or site plans, on or near sites that are served by existing or planned rapid transit, or higher frequency transit to ensure that development:

- ...
- (c) provides an appropriate mix of land uses, including a range of food destinations, that allows people to walk or take transit to work, and also provides for a variety of services and amenities that foster vibrant, transit-supportive neighborhoods;

### **Urban Designated Greenfield Areas**

2.D.17 Area Municipalities, in collaboration with the Region, will ensure that development occurring in Urban Designated Greenfield Areas will be planned and developed to:

- ...
- (c) establish a network of continuous sidewalks, community trails and bicycle pathways that provide direct, safe, comfortable and convenient linkages within the neighborhood and externally to other neighborhoods, including linkages to transit stops, employment areas, school sites, food destinations and community facilities.



## From turf to table: Grass seed to edible grains in the Willamette Valley

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### Abstract

Western Oregon's Willamette Valley has a rich history of agricultural production and, like an increasing number of regions globally, a growing local food movement. Recent declines in grass seed markets and an increased consumer interest in local grains have raised the possibility of a transition from grass seed land to edible grain production for local markets. We used geographic information systems (GIS) to determine if the Willamette Valley

population's dietary grain needs could be met if current grass seed land were converted to production of soft white winter wheat. In order to explore transitional obstacles and opportunities, we conducted interviews with local farmers, a wholesaler, an agriculture extension worker, and seed developers. The GIS analysis indicated that such a transition could exceed the recommended grain needs of the region's 2008 population. The interviews revealed technical and cultural aspects of transitioning from grass seed production to wheat and other edible crops, identifying insufficient infrastructure (storage, processing, distribution, and market outlets) as the primary barrier to producing for local markets. This combination of GIS analysis (predictive of the food-producing capacity of a region) with in-depth contextual information and practical insights from farmers' voices provides a robust model for planners seeking to analyze and address local food system challenges and possibilities. Our research, while focusing on the Willamette Valley's transition toward a more locally based food system, explores the potential steps for any region looking to transition from nonedible to edible crop production for local consumption.

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## Keywords

crop transitioning, edible grains, food system analysis, GIS, grass seed, local food systems, Willamette Valley

## Introduction

### *Local Food*

Eating locally has been endorsed in popular literature by authors such as Michael Pollan (2006) and Barbara Kingsolver (Kingsolver, Hopp, & Kingsolver, 2007), as well as in a growing body of research promoting local food and assessing community food production and consumption capacities (see Allen, FitzSimmons, Goodman, & Warner, 2003; Colasanti & Hamm, 2010; Delind, 2006; Feagan, 2007; Feenstra, 1997; Giombolini, Chambers, Schlegel, & Dunne, 2010; Herrin & Gussow, 1989; Hinrichs, 2000; Hinrichs, 2003; Ilbery, Watts, & Simpson, 2006; Marsden, 1995; Selfa & Qazi, 2005). However, recent studies have shown that current local food production may be insufficient to meet local food needs (Desjardins, MacRae, & Schumilas, 2009; Giombolini et al., 2010; Peters, Bills, Lembo, Wilkins, & Fick, 2008). One avenue to increasing local food production may come from transitioning cultivation from non-edible to edible crops, thus strengthening local food systems<sup>1</sup> for consumers and producers. Understanding the obstacles to and opportunities for such a transition requires analyzing yield potentials and examining the challenges that may be faced by those involved. Our research addresses these goals by exploring a transition from non-edible grass seed to edible grain production for local consumption in Oregon's Willamette Valley. While we acknowledge the importance of growing a diversity of crops and a variety of edible grains, we have chosen wheat for our case study because of its importance as a dietary staple, the history of wheat production in the region, the absence of wheat in common local food venues, the relative

similarities in grass seed and edible grain production, and the availability of research on wheat yields.

According to the United States Department of Agriculture (USDA) and United States Department of Health and Human Services (USHHS) 2005 *Dietary Guidelines for Americans*, a balanced diet should consist of a combination of grains, meat and beans, vegetables, fruits, dairy, and oils, with grains making up the majority of a healthy diet. In the context of local food venues such as farmers' markets and community supported agriculture (CSA), grains in large quantities are frequently absent, compared to seasonal fruits and vegetables, dairy, and meats. While grains may be available through food cooperatives, retail stores, and bakeries, the relative absence of local grains from these venues as well speaks to a gap in our local food systems. This lack largely stems from grains, such as wheat, generally being produced as large-scale commodity crops for export from regions known for high yields, such as the Great Plains in the central United States (USDA, 2009a). When looking at how to transition to increased local food production, it is important to consider the issue of scale of production and the argument for competitive advantage in grain production on larger fields with more mechanization. This, however, does not diminish how the relative lack of local grains creates challenges for communities and individuals working to build local food systems.

This research focuses on crop transitioning to wheat and other edible grains within Western Oregon's Willamette River Basin due to the region's history of rich agricultural production and its vibrant local food movement. Much of the region's agricultural land is currently in nursery crop, hayseed, and grass seed production (ODA, 2008a) (see table 1 for 2009 Willamette Valley crop data in acreage and value).

Wheat is an important cash crop in Oregon and is predominantly grown in the eastern part of the state. The Willamette Valley also produces wheat for national and international markets, although the amount harvested fluctuates greatly from year to year (ODA, 2009a) in response to national and

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<sup>1</sup> Feenstra (1997, p. 28) summarizes local food systems as adapted to particular places where "local environmental and community health priorities" become integral aspects of food production and markets.

**Table 1. Willamette Valley, Oregon 2009 Field Crop Data by Acreage and Value** (all values in US\$)

Field Crops	Land in Production		Value (US\$)
	Acres	Hectares	
Barley	32,000	13,000	4,896,000
Corn, grain	32,000	13,000	28,208,000
Corn, silage	26,000	10,500	23,230,000
Hay, alfalfa	400,000	162,000	221,400,000
Hay, all other	630,000	255,000	243,432,000
Hops	6,106	2,471	43,185,000
Oats	22,000	9,000	6,710,000
Peppermint	21,000	8,000	38,107,000
Potatoes	37,000	15,000	151,293,000
Sugarbeets	10,600	4,300	16,590,000
Wheat	877,000	355,000	223,633,000
<b>Seed Crops</b>			
Alfalfa seed	2,300	900	3,432,000
Bentgrass seed	6,680	2,700	10,262,000
Bluegrass seed	19,880	8,050	22,539,000
Fescue seed	179,000	72,000	124,093,000
Ryegrass seed annual	118,520	47,960	40,946,000
Ryegrass seed perennial	107,420	43,470	81,984,000

Source: Oregon Department of Agriculture (ODA) and National Agricultural Statistics Service (NASS). (2009). *Facts and Figures*. Retrieved from <http://www.oregon.gov/ODA/statistics.shtml>

international markets. Based on the recommended dietary requirements of the USDA and USHHS 2005 *Dietary Guidelines for Americans*, edible grain production in the Willamette Valley growing region would not have met the 2008 population's requirements for any of the last five years of production. In 2004 crop yields equaled 73% of the 2008 population's dietary requirements; in 2005 it met 34%; in 2006 and 2007 it met 29%; and in 2008 it met 67% (Giombolini et al., 2010). Within these fluctuations, even the relatively high numbers can be deceiving. In 2006, 92% of the wheat produced in Oregon was exported, principally to Asian markets where it was used to make such items as steamed buns and noodles (ODA, 2007). This last fact is not to recommend that international trade should cease, but to illustrate that while Willamette

Valley grain yields have the potential to meet a significant percentage of the local population's recommended dietary requirements, local consumers are not benefitting from it.

The demand and marketing of local food is expanding beyond farmers' markets and community supported agriculture to community organizations, large and small grocers, cooperatives, and supermarkets (Blake, Mellor, & Crane, 2010; Borst, 2008; Dunne, Chambers, Giombolini, & Schlegel, 2010; Guptill & Wilkins, 2002; Morris & Buller, 2003). As Feagan (2007) has noted, community is an important component of local food systems because food is intertwined with community. There are several emerging community organizations in the Willamette Valley that support the expansion of a local food system and play an important role in expanding production and markets for local edible grains.

In the southern Willamette Valley two community groups, The Ten Rivers Food Web<sup>2</sup> (TRFW) and Willamette Valley Farm and Food Coalition<sup>3</sup>

(WVFFC), have partnered to support the Southern Willamette Valley Bean and Grain Coalition (SWVBGC).<sup>4</sup> These groups publish blogs to document their meetings at which they discuss successes and challenges in production as well as provide information on growing and purchasing edible grains (for example, see Armstrong, 2008; MacCormack, Kise, & Augerot, 2008). Both the

<sup>2</sup> TRFW (<http://www.tenriversfoodweb.org>) was founded in 2004 and is dedicated to building a resilient food community in Oregon's Benton, Linn, and Lincoln counties.

<sup>3</sup> WVFFC (<http://www.lanefood.org>) was founded in 2000 and is dedicated to building "a secure and sustainable" food system in Lane County, Oregon.

<sup>4</sup> The SWVBGC has been meeting since 2008 (Southern Willamette Valley Bean and Grain Project, 2010). See the website at <http://www.mudcitypress.com/beanandgrain.html>

TRFW and WVFFC focus on community initiatives, grower networking, and food education. The SWVBGC consists of farmers, distributors, activists, and community members interested in developing economically sound organic bean and grain production methods, as well as local markets for their sale. According to the SWVBGC's blog, the group formed and has grown in response to a number of perceived issues, including the increased cost of petroleum products, fluctuating world grain prices, and concern over nonexistent local bean and grain distribution infrastructure (Armstrong, 2008). It is through community organizations such as these that much research, education, and policy initiatives about community food systems are conducted.

#### *From Grass Seed to Grains*

Grass seed — cool season forage and turf grass — has been an important commodity for Oregon's economy as well as its landscape. Oregon growers produce essentially all of the U.S. production of annual ryegrass, perennial ryegrass, bentgrass, and fine fescue. Smaller amounts of Kentucky bluegrass, orchardgrass, and tall fescue are also grown in Oregon (OSU, 2009). It is the third highest value commodity crop grown in Oregon, grossing over US\$500 million in 2008 (ODA, 2008a). The temperate climate of Oregon's Willamette Valley, with wet winters and arid summers, makes it one of the world's most productive regions for grass seed farming (Young, 2003). According to 2008 crop production data from Oregon State University Extension Service's (OSUES) Oregon Agriculture Information Network database (OAIN), over 450,000 acres (180,000 hectares) of agricultural land in the Willamette Valley is in grass seed production; in 2003 this represented more than one third of the growing region's cropland (Young, 2003). In 2009, the numbers dropped slightly to just over 410,000 acres (170,000 hectares) of grass seed cultivated in the Willamette Valley growing region (OSUES, 2008).

Grass seed production in the region faces challenges as new laws influencing agricultural practices for producing crops as well as declining market values cause farmers to consider possible alterna-

tive crops. The near-total ban on field burning that passed Oregon's legislature in the summer of 2009 (SB-528) may speed a change in the percentage of land producing grass seed (Oregon Legislative Assembly, 2009). Field burning has been a popular grass seed farming technique since its implementation in 1948. It is used to control weeds, remove straw residue, and eliminate crop diseases (Chilcote, 1969). Although limited burn restrictions have been in place since the late 1980s, the recent legislation is a far stricter ban, which creates more obstacles to grass seed production (ODA, 2008b). The greatest effects of the ban will be on land currently in annual ryegrass, the most commonly grown but lowest value grass seed variety (Young, 2003). According to an OSU extension service field crops agent, because annual ryegrass is the most successfully grown but has the lowest returns, the increased costs of inputs and maintenance as a result of being unable to burn the fields will make growing annual ryegrass economically unfeasible.

Recent global economic conditions have also influenced the grass seed market. A 2009 article in *The Oregonian* highlighted decreased demand due to reduced planting of lawns and golf courses as one of the challenges grass seed farmers face (Read, 2009). Market prices for annual ryegrass seed in August 2009 hovered around US\$0.18 per pound, while grass seed costs approximately US\$0.26 per pound to produce (Dietz, 2009). Different varieties of grass seed command different prices. In spring 2010, annual ryegrass sold for US\$0.15 per pound while perennial ryegrass sold for US\$0.40 to US\$0.50 cents a pound (T. Silberstein, Oregon State University Extension Service field crops agent, personal communication, February 4, 2010). Due to adverse market conditions, economic factors such as the decline in housing starts, and legal restrictions on field management practices, the future of the grass seed industry is unclear (Repko, 2009). This has spurred many regional grass seed farmers to begin to seek out alternative crops (Lies, 2009).

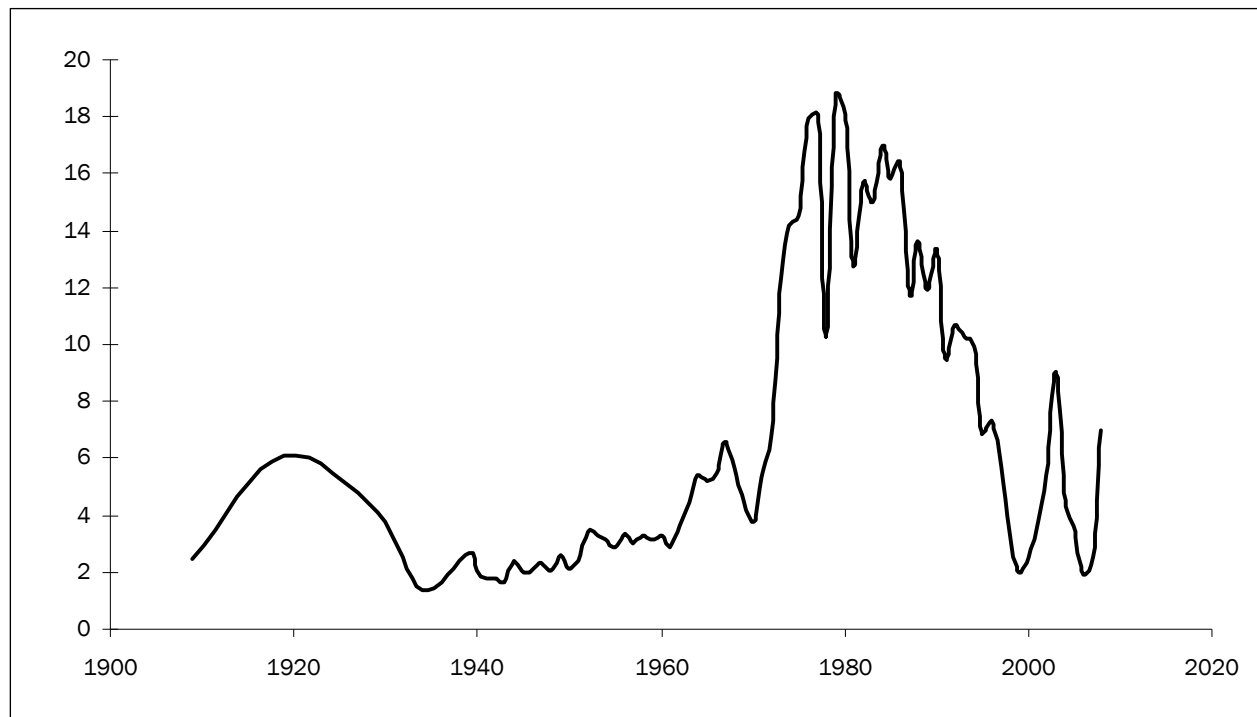
Given the widespread use of wheat in the United States, the growing market demand for local foods, and the similarities in cropping techniques to non-

edible grains, wheat has potential as a grass seed replacement crop. In the past, it was grown widely throughout the Willamette Valley (Bunting, 1995). According to Brumfield (1968), the region was one of the primary wheat-growing areas in the Pacific Northwest during early European settlement. Wheat milling and processing facilities were built throughout the area beginning in the 1830s. Wheat production was phased out over time due to competing grass seed markets. Malone (2010) provides a detailed history of the rise of grass seed production in the lower Willamette Valley, describing it as resulting from economic and social changes (e.g., World War II and increased demand for turf and forage seed). Figure 1 illustrates the change in wheat yields in the Willamette Valley over the past century.

For our research, we used the Willamette Valley as a case study for transitioning grass seed acreage to wheat production. Given the potential for this growing region to produce its own grain, as well as

its population's interest in purchasing local foods, it is uniquely suited to testing strategies for creating local markets for grains, a staple not commonly sourced locally. Using geographic information systems (GIS) analysis, we projected estimated soft white winter wheat yields for land currently in grass seed production to determine whether wheat production on transitioned lands could meet the regional population's dietary grain requirements. Interviews were conducted in order to more holistically illustrate the necessary steps and attendant challenges in transitioning from grass seed to edible grain production. Local food system planning must address all aspects of grain production — cultivation, processing, transportation, distribution, and policy — if it is to support these agricultural and societal transitions. This research illustrates a method of investigating transitions to more local food production and the importance of including many voices in the research, planning, and policy processes. An important finding of our research for building more resilient local food

**Figure 1. Annual Wheat Yields for Oregon's Northwest District, 1990–2010** (Millions of bushels)



Note: The Northwest District encompasses the following counties: Benton, Clackamas, Clatsop, Columbia, Lane, Lincoln, Linn, Marion, Multnomah, Polk, Tillamook, Washinton and Yamhill.

Source: USDA and NASS, 2010. Figure derived from historical survey data and annual data.

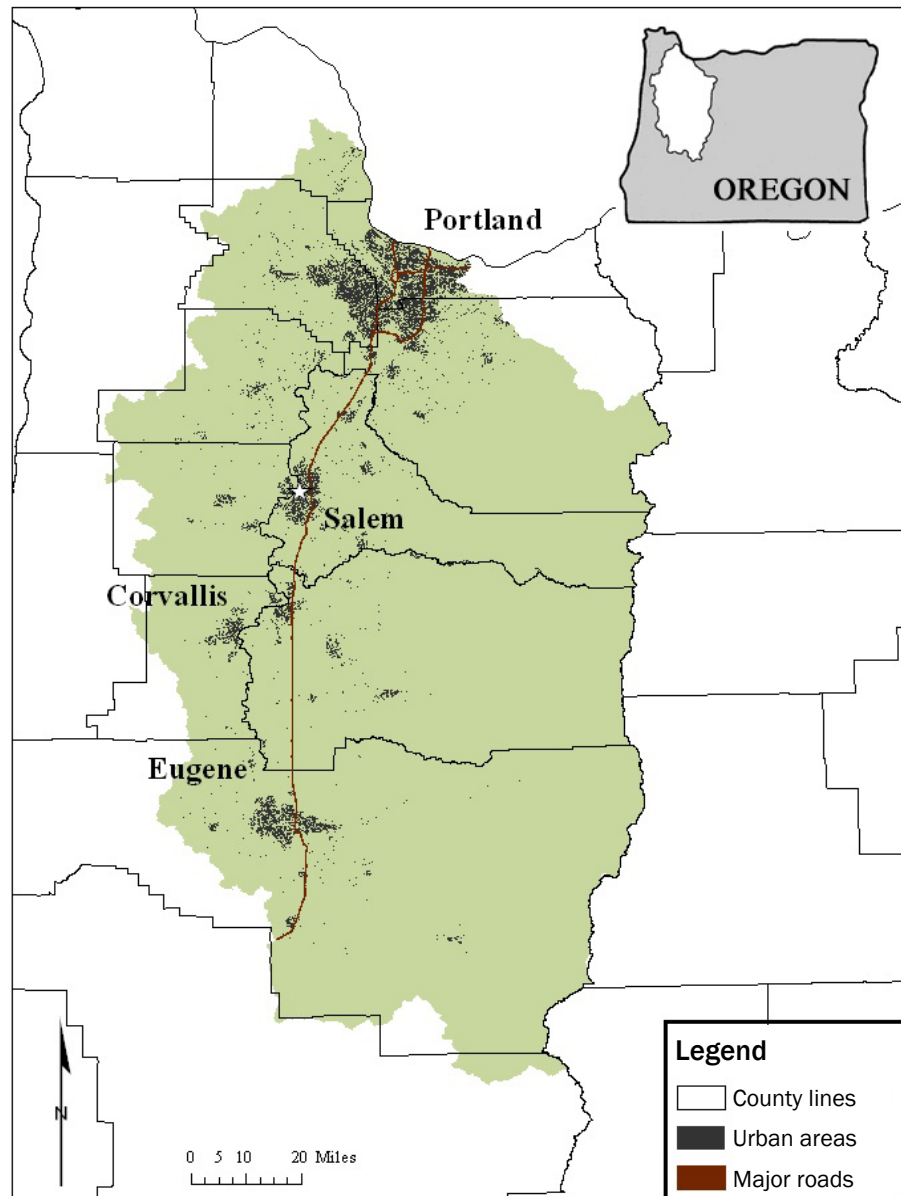
systems is the need to further investigate local infrastructure.

### Study Area

The Willamette Valley, bound between the Coastal and Cascade Mountain ranges on the west and east, with the Columbia River to the north and the drainage divide of the Umpqua River to the south, encompasses approximately 11,500 square miles (29,800 square km) (USGS, 1996) (see figure 2). The floor of this valley holds some of the most productive soils in the world, developed over time through volcanic activity and periodic flooding (Bell & McDaniel, 2000). Cool, wet winters and warm, dry summers allow for over 170 different crops to be grown in this fertile region (ODA, 2009b). Steady rainfall occurs from December through February, followed by relatively aridity in summers, which average only five percent of the total annual average precipitation (PNW-ERC, 2002).

In 2009 there were over 38,000 farms in the Willamette Valley, which encompasses the counties of Benton, Clackamas, Columbia, Lane, Linn, Marion, Multnomah, Polk, Washington, and Yamhill, with an average farm size of 425 acres (172 hectares) (ODA, 2009a). The majority of farms (80%) are 180 acres (73 hectares) or less, and over 60% are 50 acres (20 hectares) or less (ODA, 2009a). These numbers can be slightly misleading and may suggest a more diverse farming

**Figure 2. The Willamette Valley Growing Region**



Sources: Pacific Northwest Ecosystem Research Consortium 2002; Oregon Geospatial Clearing House, 2008.

economy in the Willamette Valley than actually exists. When comparing 2007 farm data for Oregon on the basis of annual sales, acreage, and number of farms, 7.1% of farms accounted for 85.7% of total annual sales and 48.5% of total acreage (Coba, 2010). Despite these numbers representing Oregon as a whole (rather than the Willamette Valley growing region alone) and the



arid landscape of the majority of the state necessitating larger farms for profitability, they doubtless portray what is basically true for the Willamette Valley: A few larger farms account for a majority of total acreage and revenue.

The Willamette Valley growing region also has relatively high population density. According to 2008 U.S. Census estimates, there are over 2.5 million people living in the Willamette Valley (Proehl, 2009) with four of Oregon's six Standard Metropolitan Statistical Areas (SMSAs) — Eugene, Portland, Salem, and Corvallis — located in the region.

### Methods

To visually represent current grass seed crop production land in the Willamette Valley and provide numerical projections for soft white winter wheat yields from land in grass seed, we used the GIS software ArcMap (ESRI, 2008) to analyze crop production data. We used the yield projections, along with recommended dietary requirements for the 2008 population in the region (based on the USDA and USHHS's 2005 *Dietary Guidelines for Americans*), to determine if yields from areas converted from grass seed to wheat production could meet the dietary grain needs of the local population. In order to better understand the process of transitioning from grass seed to wheat, we conducted semistructured interviews with farmers either transitioning their land or currently growing wheat, edible grain, and/or beans for both local and commercial markets, as well as individuals connected to increasing local food production in the Willamette Valley. Interviewees represented the most central characters in the transitioning process in the growing region at the time of the research (2009–2010).

#### *GIS and Crop Production Analysis*

**Datasets.** We used three publically accessible datasets to assess the potential for soft white winter wheat production in 2007 of fields planted in grass

seed in the Willamette Valley.<sup>5</sup> We began with a National Agricultural Statistics Service (NASS) raster-based file for 2007 Oregon cropland that was clipped to the Willamette River Basin. Secondly, we used a personal geodatabase file based on Soil Survey Geographic (SSURGO) surveys that give the predicted weighted average soft white winter wheat yields for each soil type in bushels per acre<sup>6</sup> (NRCS, 2009). Soil productivity (measured in bushels per acre) was obtained from soil survey data conducted by the NRCS, which used a variety of methods, including interviews with agricultural producers, review of crop yield data collected by USDA Farm Service Agency county offices, interviews with Oregon State County extension agents who are familiar with wheat yields on soils in their counties of responsibility, and rod row sampling, to determine soil productivity. Another geodatabase file was used to intersect the Willamette Valley SSURGO wheat yields feature class with the polygon grass seed shapefile converted from a raster. This feature class contained the SSURGO soil survey polygons and weighted average soft white winter wheat yields for all areas identified as grass seed land in the NASS 2007 crop cover raster dataset. This final dataset was used to calculate the potential soft white winter wheat yields for areas currently in grass seed production.

**Crop production potential calculation.** Each of the classified soils had specific weighted average soft white winter wheat yields (in bushels per acre) that were used to calculate total projected yields. We used only land yielding 100 bushels per acre or greater to calculate total potential soft white winter wheat crop production because economically viable land in western Oregon must produce an average of at least 100 bushels of wheat per acre (T. Silberstein, Oregon State University Extension Service field crops agent, personal communication, February 11, 2010). The benchmark of 100 bushels per acre used in this study is not, however, presented

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<sup>5</sup> Steve Campbell of the National Resource Conservation Service (NRCS) in Portland, Oregon, provided the datasets used for this first stage of the analysis.

<sup>6</sup> Acres rather than hectares were used in this study because available agriculture data was given in bushels per acre.

as a prescription to farmers; there is a complexity of factors that influence a farmer's decision to grow particular crops. The total number of bushels was then converted to pounds of wheat flour based on the most recent version of the USDA and NASS *Agricultural Statistics* (2007), a publication of commodity conversion factors for various agricultural crops and livestock. Using the conversion factor for bushels of wheat to pounds of wheat flour (2.3 bushels yields to 100 pounds of flour), we determined how many pounds of flour would be produced. Finally, in order to determine if the yielded number would match the 2008 Willamette Valley population's recommended dietary requirements for grain we converted the pounds to grams, because serving sizes are designated in grams (see the following equation):

$$\frac{\text{Total \# of bushels}}{2.3} \times 45359.24 \div 30 = \text{Total servings produced}$$

It is important to note that this conversion factor is based on hard red wheat bread flour (i.e., white unbleached flour). There is a difference in weight between white and whole-wheat flour. The process of making white wheat flour retains only approximately 75% of the original grain weight after key nutritional components such as the bran and germ are removed from the grain kernel (Kansas State University Extension Service, 1997). The actual weight depends on the processing technique (stone ground, steel bur ground, removal of germ and bran, etc.). With this in mind, the final produced weight of whole-wheat flour may be higher.

**Population and dietary grain requirements.** We acquired detailed population data from the 2008 *Oregon Population Report*, an annual publication of Portland State University's Population Research Center (Proehl, 2009). This population data was used in conjunction with USDA and USHSS (2005) *Dietary Guidelines for Americans* recommended daily requirements to calculate grain servings for the region's population. These calculations were based on data used in previous research conducted by Giombolini et al. (2010).

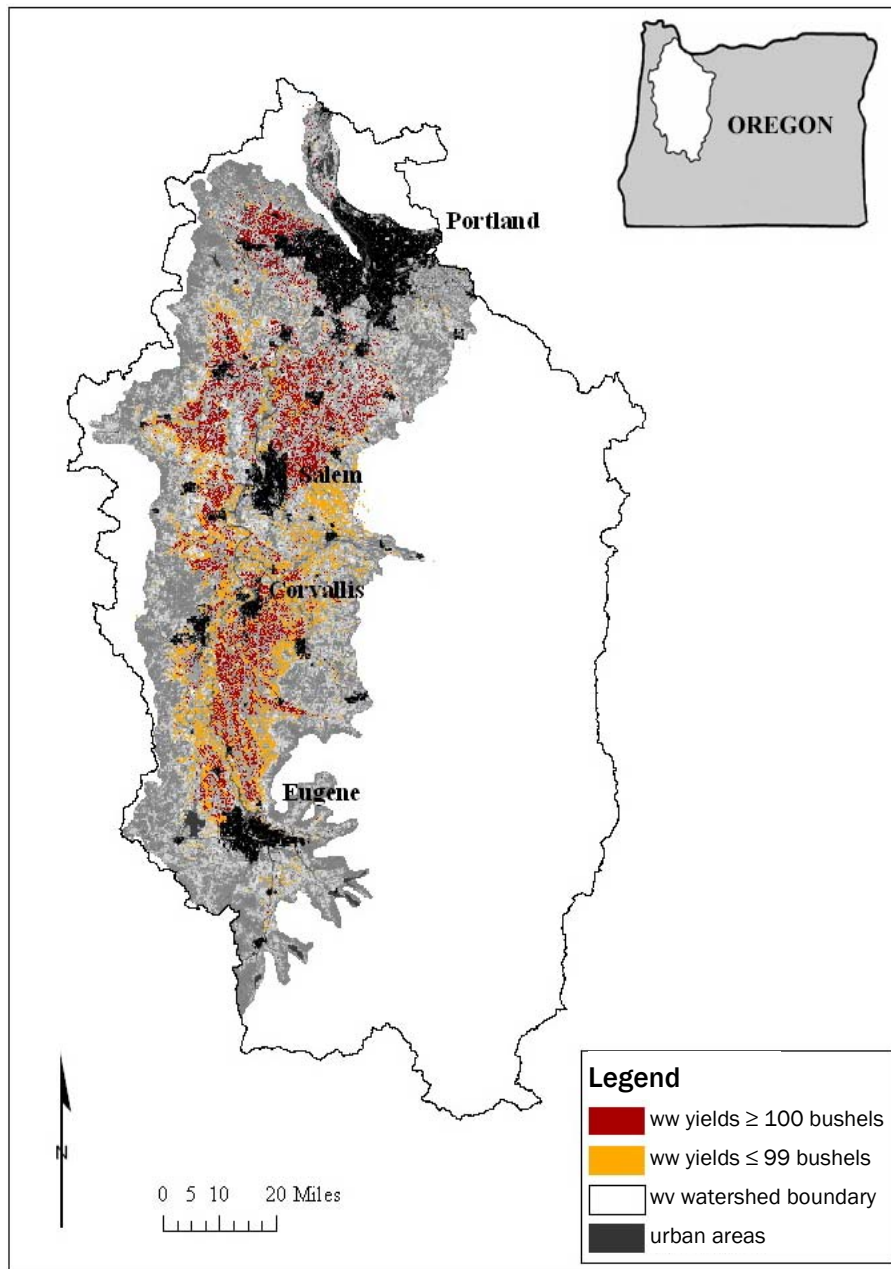
**Soil ratings and cartography.** In order to visually represent the potential growing regions for soft white winter wheat in the Willamette Valley, we created a weighted map highlighting the areas of greatest wheat yields. Some soils exhibited much higher wheat yields than others. Two categories, based on information from Oregon State University Extension Service (T. Silberstein, Oregon State University Extension Service field crops agent, personal communication, February 11, 2010), were used to differentiate potential soft white winter wheat yields: equal to or less than 99 bushels, and 100 bushels or greater. These categories were selected because we only used land with predicted yields of 100 bushel or greater for the analysis to reflect economic viability of yields. The map comprehensively illustrates the Willamette Valley's grass seed acreage (see figure 3).

#### *Interviews*

We conducted semistructured interviews to create a broad overview of the grass seed industry, regional agriculture, and the process of transitioning to edible grain production in the Willamette Valley. The semistructured format allowed for comparability and consistency. As the goals of this component of our research were qualitative in nature rather than quantitative, participants were chosen using purposeful sampling (Bickman & Rog, 1998; Patton, 1990). We focused primarily on a group of farmers, distributors, and community members in the southern Willamette Valley dedicated to local food security and transitioning to a more localized food system.

Most of the farmers interviewed were key informants who represented the core of the transitioning movement at the time of our research (2009–2010) and were associated with the Southern Willamette Valley Bean and Grain Coalition (SWVBGC). Three of the participants interviewed were large-scale grass seed farmers (their acreage ranged from 800 acres to 9,300 acres, or 300 hectares to 3,800 hectares) transitioning to edible grain production for local markets. One interviewee was a small-scale organic farmer engaged in growing test plots of different wheat varieties to determine their suitability to the region before

**Figure 3. Map of the Willamette Valley's (WV) Projected Soft White Winter Wheat Yields (ww) in Bushels per Acre on Grass Seed Land**



Sources: 2007 NASS (2007) crop data, SSURGO (2009) soil data, and 2000 land cover use from the Pacific NorthWest-Ecosystem Research Consortium (2002).

recommending their use to large-scale grass seed farmers. We also interviewed a wholesaler spearheading the transition's marketing aspect. Additional interviews were conducted with four others not directly connected with the SWVBGC: one

agriculture extension representative, two grass seed growers not transitioning, and one small-scale farmer/seed researcher. The number sampled is representative of the key actors and reflects the majority of attitudes of those involved with this small movement and initiative.

Interview questions included a variety of survey, specific, attribute, and structural questions (Bickman & Rog, 1998) focused on grass seed and wheat production, farming ideology, and marketing. Farmers were asked different questions from those asked of local distributors and other community members working to facilitate the transition from nonedible export crops to edibles grains for local markets. Interviews were held at participants' offices, farms, or public locations of their choosing. Each interview lasted about 60 minutes. They were recorded and transcribed with the consent of the participant. Triangulation was used when possible in order to verify the validity of the interviews by comparing the information provided to other

sources such as statistics or alternative references (Bickman & Rog, 1998).

### Results

After summing the total areas of each soil type (for

those yielding 100 bushels per acre or greater) and multiplying this number by the associated soft white winter wheat yields (bushels/acre), we combined the totals to give projected bushels of soft white winter wheat from land in grass seed production. Of the total area, 264,581 acres (107,072 hectares) yielded less than 99 bushels, and 250,537 acres (101,389 hectares) yielded 100 bushels or greater. Based on calculations determining the total yields of winter wheat in bushels from land in grass seed production in 2007, the recommended dietary grain needs of the Willamette Valley's 2008 population would be met two times over. The total projected number, 25,324,934 bushels of soft white winter wheat, converts to 16,648,112,453 servings. The recommended dietary grain needs (based on gender and age) for the 2008 population of the Willamette Valley is 6,836,647,100 servings.

### **Discussion: The Transitioning Process**

The projected numbers from our GIS model have shown that it is possible to meet the recommended dietary grain needs for the Willamette Valley's 2008 population by transitioning from grass seed to wheat production. The GIS model, however, is based on predicted outcomes without taking into account the various and complex factors that influence crop production. With this in mind, what are the perceived obstacles to this transition? The following discussion uses information gathered through interviews to contextualize the calculated numbers for potential wheat production.

Farmers interviewed described transitioning as a holistic process with a need to focus not only on transitioning to different crops but also to different farming techniques and marketing strategies. They saw that transitioning is not limited to changing from grass seed to wheat, but from grass seed to other edible grains, beans, and seeds as well, bringing crop rotation particularly into focus due to the potentially higher yields to which it can lead. Farmers also discussed transitioning from conventional agriculture to more organic-based production. Interviewees stressed their reasons for feeling that a transition to organic production was important to make, how this influenced their farming practices, and the attendant risks and

barriers. Members of the SWVBGC have coalesced around organic production due to the environmental and health benefits of organic food, in addition to their sense that many consumers interested in local food prefer that their food be organic (Armstrong, 2008). Production by members of the SWVBGC has grown from humble beginnings of less than 50 acres (20 hectares) of transitional or organic beans and grains to more than 600 acres (250 hectares) transitioning to organic, and over 100 acres (40 hectares) certified organic (Armstrong, 2010a; MacCormack et al., 2008).

Our interview results reveal that transitioning from grass seed to edible grains in the Willamette Valley would involve building local food systems, technical farm changes, and a cultural shift. We believe that these practical insights from local voices on the requirements for transitioning from nonedible crops to edible grains are not unique to the Willamette Valley. The following insights represent individuals' perspectives and provide contextual information and a robust model for planners in other communities seeking to analyze and address local food system challenges and opportunities.

#### *Building Local Food Systems*

Our interview findings reveal the need for the transition from grass seed crops to edible grains and beans to extend beyond the farmers and their fields to building local food systems with increased infrastructure, along with market creation that includes expanded community involvement.

**Rebuilding infrastructure.** According to the interviewees, one of the greatest barriers to the transitioning process is the lack of infrastructure that is needed to adequately promote local food production, processing, distribution, and consumption. Without these infrastructure elements, creating a reliable market where local crops can be sold is difficult. Most farmers do not have the time or skills to create infrastructure or develop markets. While several farmers currently provide the storage facilities, process, and distribute their crops out of necessity, many made a point of emphasizing that they were farmers — not processors. While

multiple roles may be evolving for farmers, each part of the food system requires different skill sets. Farmers represent only one part of that system.

Grain production is highly regionally specific and generally requires primary or secondary processing before marketing to consumers (USDA, 2009a). This presents what some perceive as a barrier to creating local food systems for grains, as appropriate infrastructure must be created to process harvests from raw and often inedible states (MacCormack et al., 2008; Merlo, 2005). On one hand this can be considered a barrier, but growing a local food system also creates an opportunity for new businesses and entrepreneurs. The Willamette Valley currently has little infrastructure to support the storage, processing, and distribution of local grains, beans, and edible seeds. That which existed historically disappeared with the increase in grass seed production.

Storage is a particularly significant issue. One farmer observed:

Storage, to a big degree, is going to rely on the farmer. For us, we are taking bins at our seed warehouse that would normally be for grass seed and we are going to be storing different grains.

Farmers themselves, especially those who clean seed and have extra storage space, will initially house the seed before it enters the market. One farmer who owns a 17,000-acre (7,000-hectare) grass seed farm commented that he is increasing his facilities for wheat storage as a method of avoiding the saturated wheat harvest market and commanding a higher price during other times. Malone (2010) identifies grain storage and processing facilities located in Oregon and notes that only one elevator in the Willamette Valley is licensed to store and transport organic wheat. Lack of storage space is a critical factor in making it difficult for farmers with limited storage space to grow for the local market. Farmers are taking on multiple roles since current conditions are leaving them without many options, but as operations grow increased infrastructure will be needed. The

SWVBGC blog notes that members express concerns that additional storage infrastructure will need to be developed in order to accommodate larger future harvests of grain and beans (Armstrong, 2010a).

In addition to lacking sufficient storage, the Willamette Valley has few processing plants and mills. Its dominant flour mill is Cereal Food Processors, Inc., a privately held corporation and America's largest independent flour milling company. This mill processes 760,000 pounds (340,000 kg) of flour per day. The majority is produced from hard red wheat grown not in Oregon, but in Montana (Cereal Food Processors representative, personal communication, April 21, 2010). While there are smaller processors such as Bob's Red Mill in Milwaukie and Grain Millers in Eugene, they typically do not process the small quantities of grain that many producers are looking to sell locally. In 2009, approximately 500,000 pounds (over 200,000 kg) of wheat produced in the Willamette Valley was available to be milled for the local market. A small mill<sup>7</sup> with a grinding capacity of 750 pounds (340 kg) of wheat a day would only need to operate 12 to 14 hours a week to meet the processing needs of the local population (J. Henderson, sales coordinator for wholesaler, personal communication, April 21, 2010). Farmers note that the lack of small processing plants makes it hard to market local wheat, but wonder at what point is enough grain produced to justify investing in this infrastructure.

Without mills, wheat is sold as a whole grain, a form which is inconvenient as well as unfamiliar to the many who prefer flour for cooking and baking. One option may be to sell whole grain to consumers and develop the infrastructure for personal grinding. Located in Corvallis, Oregon, the First Alternative Co-op has installed two flour grinders, one for whole wheat bread flour and one for whole

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<sup>7</sup> Small mills are available for approximately US\$50,000, not including system development charges, rent for the building, utilities, labor to run the machine, the costs of the dust control system (about US\$20,000), a bagging line, a fork lift, and other costs (J. Henderson, sales coordinator for wholesaler, personal communication, April 21, 2010).

wheat pastry flour, giving customers the ability to grind whole grain wheat in quantities suitable for home use. Approximately five pounds (2.3 kg) of bread flour and two pounds (0.9 kg) of pastry flour are processed daily. This is an example of a positive, if very small step, as a wide range of milling options including both small and larger scale grinding facilities may be needed in order to seriously promote wheat locally.

In their blog posts, the SWVBGC farmers detail how in 2010 they took steps toward infrastructure development with the addition of four organic seed cleaning facilities and two small organic grain mills (Armstrong, 2010a; Rea, 2010). They note, however, that despite these steps, securing adequate facilities for storing harvested grains and processed flour remains essential if grain products are to be kept free of vermin and mold (Armstrong, 2009). While SWVBGC members have thus far been able to overcome structural barriers to the production, processing, and sale of organic grains and dry beans, increased production and markets (with the ultimate goal of profitability for farmers) will require expansion of critical local food system infrastructure components.

**Market Creation.** In the Willamette Valley, the development of local food markets for grains has begun through the work of community organizations, a wholesaler, and individuals who share risks with the farmers. This step is critical, as farmers will not produce if market demand is not there. Some local organizations are working to develop markets, such as the SWVBGC, which has the stated intention of helping farmers transition and sell locally and is considering producer cooperatives as a potential option for increasing farmers' capacity to do so (Armstrong, 2008; Armstrong, 2010a; MacCormack et al., 2008).

Many questions surround the long-term strategies needed to develop a local market for grains. For example, although producers report that demand continually outstrips supply, the local market's ability to absorb these crops may be tested in the next couple years as more than 500 acres (200 hectares) of grass seed are transitioned to beans

and grains (Armstrong, 2010a). The question of how to manage production so that the supply of grains and beans does not flood the market has been raised for the future of the SWVBGC (Armstrong, 2010a; Armstrong, 2010b). To avoid overproduction it is important to develop a diversity of markets and different avenues to market the increasing supply of beans and grains.

A wholesale company based in Eugene has been working diligently alongside local farmers to provide markets for their crops. The CEO of the company notes:

If we had enough market there would be a lot more farmers interested in growing these [crops]. If we could provide contracts for the farmers then they would definitely grow.

The wholesaler is interested in establishing contracts with farmers in order to have stable agreements between both parties with an agreed upon price and quantity. Economic incentives to providing local crops exist because they tend to command higher prices, but reliable markets are needed in order to sell the grain. Farmers rely on the support from such companies to create avenues for distribution, in order to successfully transition from grass seeds to edible crops for local markets.

Personal interaction plays an important role in gaining customer trust and support for establishing alternative food systems (Watts, Ilbery, & Maye, 2005). The wholesaler in question has invested time, energy, and resources into understanding its customer base and creating new markets for the local crops being grown. It has sent a questionnaire to customers asking if they would be willing to buy transitional, not organic, products locally during the three years the farmer transitions to organic. Overall, it found customers supportive of buying transitional crops.

Given the risks inherent in the transitioning process, financial support from wholesalers is crucial to transitioning farmers. The CEO states,

We go in with the farmer where we give the farmer money down, plus we also provide the seed; we really want to take the risk with the farmer if we know that we can sell the crop.

Such companies share risks with farmers to make the system work by providing financial support through a difficult growing season or providing some of the inputs. In general, a farmer is risk-averse and does not want to take transitional risks alone; partnerships with companies such as wholesalers are crucial. Many farmers commented that the transition from grass seed to edible grains and beans would not be possible without support from the wholesaler: it was the catalyst for the transitioning process. Future support from community members and other entities such as buying clubs may be another option to help mitigate some of each farmer's risk.

All farmers necessarily take some risk as a poor crop year could lead to financial hardship, but for farmers transitioning to edible grains for local markets the risks are unique in that they are doing something different from the norm. One farmer interviewed stated,

We need guaranteed income or we can't make it; it is a really scary feeling like we could lose everything if we have a bad year.

For many farmers grass seed has provided a relatively risk-free crop for decades, if not generations. Yet farmers often operate on the margin and the current situation with grass seed sales is reducing some farmers' opportunities to diversify. A grass seed farmer who is not transitioning to edible grain crops for the local market commented on those who are transitioning away from grass seed:

It's how much risk you can take. When times are good, you can set aside some acres to experiment with. Right now we are kind of hunkering down and scraping through until times get good.

Farmers frequently find it difficult to take the initial steps toward moving outside of conventional practices because growing something different and failing may be worse than waiting it out and continuing production of crops that in the past have been dependable.

Many SWVBGC farmers have relied upon a single wholesaler to purchase and sell their transitional organic beans and grains (Armstrong, 2010b). Sole reliance on this one distributor for their product may result in overlooking the possibility of large contracts with other significant consumers, such as bakeries and restaurants. While the incremental steps taken by the SWVBGC have thus far been effective at growing and distributing organic beans and grains, more long-term market strategies will be needed (see Armstrong, 2010c). Continued growth and networking between organizations will be instrumental in supporting the transitioning process from grass seed to edible grains and beans.

#### *On-farm Technical Transitions*

Farmers interviewed described the relative ease of transitioning from farming grass seed to raising wheat and other crops, but also outlined the obstacles to such a transition. Farming contains many technical elements, and transitioning farmers must consider not only the change in crop types, but also technical transitions involving farm equipment, marketing and transport tools, seed stock, and organic production methods.

**Equipment.** Grass seed equipment requires few significant changes in order to process wheat and other such crops. According to farmers we interviewed, the main change involves investing in combine headers designed to harvest wheat. In general, given suitable header selection, wheat and grass seed (as well as most other edible grains, beans, and seeds) can be seeded, harvested, and cleaned using the same large equipment. One farmer interviewed commented:

That's the beauty. Beans, grains, and edible seeds we can harvest using grass seed equipment. We don't have to change anything.

Economically, the initial mechanical transition does not require great financial inputs. Malone (2010) presented an alternative view based on her research that found grain is more costly to produce than grass seed. Grain requires more processing (e.g., crushing and grinding the grain), but farmers interviewed said that cleaning and harvesting wheat should require few mechanical alterations. Growing dry farmed beans presents further difficulties due to the Willamette Valley's relatively short summers and inconsistent weather patterns. Having reliable harvests has been and continues to be a challenge for farmers trying to bring beans into the crop rotation and to the local market. (These comments are expressed in detail in the SWVBGC blog; see Armstrong, 2010c.)

The scale of edible crop acreage can be a determining factor in equipment selection. The farmers we interviewed were transitioning anywhere from 2 to 400 acres (0.8 to 160 hectares) of land. One couple employed a 1965 combine to harvest their hard winter wheat because:

It's probably 25% the size of our conventional combines. The older combine works perfect because we're only doing 30 or 20 acres [12 or 8 hectares].

In considering equipment changes, farmers face relatively few barriers; the real challenges concern the lack of available infrastructure for distributing, marketing, and transporting other crops.

**Marketing and transport.** Marketing and transporting grass seed is different than marketing and transporting wheat. Grass seed, although a commodity crop, is not sold on the commodity market and tends to be produced under contracts, which serve as a type of risk-management plan. Grass seed companies create contracts with farmers each year to determine the type and amount of grass seed to be planted. The farmer then grows the seed and holds it until the seed contractor picks up the seed for distribution. In this way, the farmers do not own their seed, but grow it. Two of the grass seed farmers we interviewed said that with the decline of the grass seed market, contractors are

not completely fulfilling their contracts, leaving many grass seed farmers to store grass seed from the past year that the contractor could not sell.

As wheat is a commodity, farmers are responsible for selling, transporting, and distributing the wheat they produce. Wheat value depends on volatile market prices. The break-even price for wheat grown on land yielding 100 bushels per acre is approximately US\$5.50 to US\$6.00 per bushel (T. Silberstein, Oregon State University Extension Service field crops agent, personal communication, February 11, 2010). Wheat prices in 2007 peaked at a high of US\$10.30 per bushel, which inspired many Willamette Valley grass seed farmers to grow more wheat (USDA, 2010). The spike in wheat prices proved temporary, however, and by 2009 wheat prices hovered around US\$4.50 to US\$5.00 per bushel (USDA, 2010). The volatility of market prices is an important consideration when providing recommendations from the 100 bushel yield benchmark used in our GIS model. The current marketing structures in place for wheat will need to be altered to establish a more stable market price, perhaps to a contract-based system similar to grass seed, in order to serve the local market.

**Seed stock.** The question of seed stock and seed varieties suited to the Willamette Valley is also critical to transitioning farmers, particularly which varieties of wheat to grow and what the availability of organic seed supplies might be.

The projected bushel yields from the GIS data are for soft white winter wheat varieties as opposed to hard wheat varieties. The main difference between the two varieties has to do with their respective protein levels (although gluten and ash levels are also components). Hard wheat is typically used for breads and is primarily grown in the Midwestern states, whereas soft wheat is commonly used for pastries and flatbreads and is frequently grown in the Pacific Northwest (USDA, 2009a). There is a potential market for both soft and hard wheat to meet local demand. Soft wheat can address local pastry needs, while hard wheat can address local bread baking needs. Cultivating the knowledge and ability to use both appropriately in the long term



will support increased production and consumption of local grains.

Protein levels and uniformity dictate the types of wheat grown, and grade and quality standards have limited the number of commercially produced varieties of wheat due to farmers' inability to receive government funding and loans for "undesirable" seed (Malone, 2010). Farmers interested in growing grains for the local market are diverging from these past influences on seed selection and are not necessarily relying on government subsidy programs, as they are growing seed varieties that are more rigorous for the Willamette Valley climate. During the historic boom in wheat production, both hard and soft wheat varieties were grown in the Willamette Valley. Brumfield (1968), in describing popular wheat types grown in the late 1800s and early 1900s, mentions names such as Turkey Red, Bluestem, and Marquis, all of which are hard red varieties (Carleton, 1916). These heirloom hard wheat types are now being re-introduced into the Willamette Valley as viable options.

Several farmers interviewed commented on the commonly held belief that hard wheat cannot be grown in the Willamette Valley because the climate does not allow it to develop protein levels sufficient for bread making (12% to 14% protein). Trials with hard spring wheat done by some of the farmers interviewed refuted this idea. One farmer commented:

People say you can't raise high enough protein wheat here in the valley to make good protein. We have been successful in doing that one field, one year.

"One field, one year" speaks both to the farmer's optimism and realism, as the possibility exists but there is still uncertainty about consistency. Given that these experiments are in their infancy, it bears mentioning that the consistency of such local hard wheat's protein levels from year to year is unknown. Many factors may affect these levels, particularly weather and soil; further research and variety development is needed.

Oregon State University has continually developed different cultivars of wheat suited to successful growth in the region (Ross, 2007). While the majority are types of soft white wheat, the variety commonly grown by farmers in the Willamette Valley, within the past decade researchers have also developed cultivars of hard wheat (Peterson, 2008). Although hard spring wheat trial yields are much lower than for soft white wheat, they have demonstrated that it is possible to produce adequate protein levels (Peterson, 2008). Over time and through various factors such as farm management, selection, and soil development, these yields could increase.

Some farmers also participate collaboratively in seed development. One farmer interviewed stated that he is testing out many new varieties developed by Washington State University and other breeders, both nationally and internationally. Others have dedicated small plots of land to growing out several varieties in order to gauge their success in the local climate. One farmer interviewed is growing three new hard red wheat varieties from three distinct regions — Argentina, Washington state, and North Dakota — to look at protein levels and milling qualities. In determining the type of crops to grow in the Willamette Valley on large-scale farms, farmers will have the added task of assessing a wider variety of crops with some level of trial and error. Partnerships with universities and small and large-scale farmers, as well as with community members, will be important in developing successful seed varieties.

In order to find truly suitable wheat varieties, experimentation with growing a greater diversity of crops is important. Also important is the need to recognize that achieving standard protein levels, which Malone (2010) cites as a significant barrier to local processing, does not necessarily need to be viewed as the goal. Part of the advantage of organizing on a local level is that it allows for transparency and open communication between the producer and consumer. Farmers can account for fluctuating protein levels while consumers still find the product usable. It is innovative ideas and experimentations that will create successful new crop varieties for the Willamette Valley growing

region. What is needed now is more research into growing out hard wheat varieties developed for this climate.

**Organic production.** The shift from conventional to organic agriculture requires changing farming techniques. Hanson, Dismukes, Chambers, Greene, and Kremen (2004) describe the steep learning curve farmers face in the conventional-to-organic transition as they learn biological pest controls, manage nutrient cycles without synthetic fertilizers, plant different crops, and supply new markets. Two major changes noted by farmers transitioning to organic edible grains were reduced use of chemical pesticides and the substitution of crop rotation in place of synthetic fertilizer. One farming couple transitioning part of their land stated:

Conventional farmers can learn a lot more from organic farmers than we can teach them. Chemicals are not an option with them. They look at strictly keeping that plant healthy. It's just easier to spray it with a chemical pesticide and say we've done everything we can; well, we haven't. It's not the easiest thing to do.

When discussing motivations for transitioning to organic, farmers also mentioned the impact of the recent ban on field burning:

We just can't afford the pesticide anymore. We were burning some of these fields and field burning was taken away, so we had to replace field burning with more pesticides or more crop rotation.

Burning increased yields by killing pests that conventional farmers are now treating through the use of more chemical pesticides. Farmers we spoke with also emphasized the importance of diverse organic production, with one noting:

Diversification became important; cutting down on fertilizer and chemical use brought crop rotation into focus.

The use of crop rotation and changing farming techniques to a greater focus on soil health is a key part of organic production. Transitioning to organic production of edible grains and beans may benefit Willamette Valley grass seed farmers by decreasing costly chemical and synthetic inputs.

Establishing the best organic practices for a specific farm or field such as the correct crop rotations takes time and experimentation. What works at one farm may not work at another, as they may have different soil types supportive of different crops. One farmer noted that much of the farm's soil lacks the proper drainage to grow high-protein spring wheat, and conditions in such marginal, poorly drained land is better suited to grass seed and other crops. While wheat was the focus of the present GIS analysis, this more marginal land potentially could be used to grow other edible crops, such as barley and rye. In addition to time and experimentations, the use of GIS and soil survey data will be helpful in identifying successful rotations for specific soil types. Farmers, however, must make the choice for their individual property based on a variety of complex factors.

#### *Cultural Transition*

Interviewees drew attention to additional challenges beyond technical transitions to farming. In addition to the actual technical transitioning away from grass seed production, farmers may experience a kind of cultural shift with regard to their agricultural experiences. This shift can relate to changes in which types of crops are grown, what is perceived as being an ideal field, the scale of farming, and novel market interactions. A number of benefits may accompany this cultural change, including the expansion and diversification of markets, increased food security, enhanced support for local communities, and greater opportunities to connect directly with consumers.

Quality grass seed production has a long and dignified history in the Willamette Valley, with some farming families focused on this form of agriculture for generations. Many farmers take great pride in their weed-free green fields and large store-

houses of grass seed. One farming couple we interviewed said of their acres of grass seed:

It was kind of nice in a way if you like the green lawn/golf course look. It was like “wow, we have the world’s biggest lawn.” Then you think about what’s really gone into it. Now the occasional weed popping up doesn’t bother us at all.

This couple’s statement exemplifies the changes in thought and values which many such transitioning farmers confront. They realize that the chemical fertilizers and pesticides needed to maintain the aesthetic of a weed-free field is not worth the cost and possible environmental and health consequences. However, new forms of agriculture, which may carry some risk of failure, are difficult to undertake. Learning to build soil health, plant on a smaller scale, rotate crops, and decrease pesticide use challenge many in the transitional process.

Transitions in scale require a different mindset and demand greater attention to detail. Most farmers we interviewed were accustomed to large fields, often hundreds of acres in size. Although the goal in the Willamette Valley is transitioning large amounts of acreage from grass seed to edible grain production, the process will begin with smaller acreage — 20, 50, 100 acres or 8, 20, 40 hectares, rather than thousands. In transitioning, particularly to organic production, that kind of reduction to smaller plot sizes is a dramatic change for farmers used to planting thousands of acres of grass seed. One farmer interviewed observed that farmers “are not comfortable with 10 or 20 acres at a time.” Smaller scale dictates a different interaction with their crops, as each 10 or 20 acre (4 or 8 hectare) plot requires greater attention and manual input than far larger grass seed plots.

Additionally, farmers may need to change how they view the established export-focused market system. One farmer said the following about the need to reconsider marketing:

[Marketing] locally, regionally, then internationally as opposed to now where

you sell it to these big outfits that sell it to Asia and whatever you’ve got left you dump off locally. If you flip that around you get paid more and food security will be increased.

Growing for the local market, a farmer is diversifying his or her operation by selling through a variety of outlets, while prioritizing local markets. Transcending economics, transitioning is also about supporting the local community. Our research demonstrates that farmers could produce more grain than the Willamette Valley’s population requires. While dismissing the idea of selling surplus product on the global market would be short-sighted, providing for the needs of the local community is an important consideration.

Farmers are proud of their products and of their ability to produce for a local market; to see the face of their customer represents an important ideal to many of the farmers interviewed. In the current grass seed and commodity market system, farmers have lost the connection to the final consumer of their product. One farmer reflected:

As a grass seed producer, I miss having my customer right here. We’re really quite proud of what we produce; it would be nice to see how our customer appreciates it or not. So we could adjust or whatnot. We hardly ever see the end customer, and so you don’t get that satisfaction.

In grass seed farming, there simply is no real connection with the consumer. The end product belongs by contract to seed companies who ship it in bulk to clients around the globe. Similarly the soft white winter wheat currently grown in the Willamette Valley is generally exported from the Port of Portland to Asian nations for milling and processing. In a local market system the farmer can have a connection to a local bakery and its customers. The ability to associate and form human connections with the end consumer is an important motivator in the transitioning process. The son of one farmer reflected on this personal motivation for selling directly to customers:

“Knowing that you had something to do with what everyone is having for dinner is kind of cool.” Connecting local farmers with consumers is viewed as one of the broader benefits of local food systems, promoting positive community engagement, connecting people to each other through shared connection to place, and thereby creating an inclusive sense of community (Feagan, 2007; Hendrickson & Heffernan, 2002; Martinez et al., 2010).

### **Conclusion: Transformation of Agriculture in the Willamette Valley**

In order to predict the food-producing capacity of the Willamette Valley, we used GIS analysis in conjunction with interviews to highlight practical issues and provide deeper contextual information. The combination of these methods provides a robust model for planners to analyze and address local food system challenges and opportunities. Viewed alone, GIS data is disconnected from the practical issues of implementation and the culture of agriculture, and is limited by scale and complexity. Thus interviews give greater depth to the model and open a more complex dialogue about transitioning land from nonedible to edible crops for local markets. With this type of GIS research, it is imperative to include the voices and insights of individuals because they not only provide possibilities for personal investment in the research or planning, but also give a more holistic perspective on the barriers and opportunities involved.

The Willamette Valley acts as an exciting model for how communities are organizing to support the transition to a more local food system as farmers, consumers, distributors, planners, marketers, and entrepreneurs come together to promote the well-being and resilience of their community. All actors in the food system need to be involved — from farmers transitioning to growing edible grains for local consumption rather than global grass seed markets, to organizations like the Southern Willamette Valley Bean and Grain Coalition connecting farmers, to wholesalers helping develop new markets, to community members buying local grains in order to support local production. This

research digs deeper into the process of building local food systems, focusing on growing staple foods for local populations and the importance of incorporating a new demographic of farmer outside the traditional direct-market, small organic producer. Thinking broadly, this research directs our focus on transitioning land by promoting large-scale farmers currently growing inedible crops to growing edible crop production for the local market, as well as looking at the role that organizations and all actors in the food system must play to make this transition possible.

This research lays out several next crucial research areas as scholars, planners, and nongovernmental and community organizations continue to create and experiment with new frameworks to build local food systems. Specifically, further research needs to be done on how to increase infrastructure, develop markets for producers, and expand community involvement. What are the most pressing infrastructure needs and what are strategic ways to meet those needs? What will be the characteristics of a local market? How can ownership and prioritization be ensured in a local market? How can we foster greater community involvement and awareness about local food systems and food security? These questions are critical in furthering local food system research. These questions and others will best be answered through interdisciplinary research that combines quantitative and qualitative methods and includes the voices of the local participants. Through models such as the one that we have presented with this case study, researchers, policy advocates, and policy-makers can partner with communities to build resilient, strong local food systems for the future.

### **References**

- Allen, P., FitzSimmons, M., Goodman, M., & Warner, K. (2003). Shifting plates in the agrifood landscape: The tectonics of alternative agrifood initiatives in California. *Journal of Rural Studies*, 19(1), 61–75. [http://dx.doi.org/10.1016/S0743-0167\(02\)00047-5](http://dx.doi.org/10.1016/S0743-0167(02)00047-5)
- Armstrong, D. (2008). Southern Willamette Valley Bean and Grain Project: Project report 1: January–June. Retrieved from <http://www.mudcitypress.com/beanandgrain1.html>

- Armstrong, D. (2009). Southern Willamette Valley Bean and Grain Project: Project report 6: Three farmers meetings, October. Retrieved from <http://www.mudcitypress.com/beanandgrain6.html>
- Armstrong, D. (2010a). Southern Willamette Valley Bean and Grain Project: Project report 8: Three farm tours, August. Retrieved from <http://www.mudcitypress.com/beanandgrain8.html>
- Armstrong, D. (2010b). Southern Willamette Valley Bean and Grain Project: Project report 6: Spring Meetings, March. Retrieved from <http://www.mudcitypress.com/beanandgrain7.html>
- Armstrong, D. (2010c). Southern Willamette Valley Bean and Grain Project: Project report 10: Fall Farmers Meeting, November. Retrieved from <http://www.mudcitypress.com/beanandgrain10.html>
- Bell, J. C., & McDaniel, P. A. (2000). Mollisols. In M. E. Sumner (Ed.), *Handbook of soils science* (pp. E-286–E-307). Boca Raton, Florida: CRC Press LLC.
- Bickman, L., & Rog, D. (1998). *Handbook of Applied Social Research Methods*. Thousand Oaks, CA: Sage Publications.
- Blake, M. K., Mellor, J., & Crane, L. (2010). Buying local food: Shopping practices, place, and consumption networks in defining food as “local.” *Annals of the Association of American Geographers*, 100(2), 409–426. <http://dx.doi.org/10.1080/00045601003595545>
- Borst, A. (2008). Farmers, co-ops and local food marketing. *Rural Cooperatives*, 75(5), 10–12.
- Brumfield, K. (1968). *This was wheat farming*. Seattle, Washington: Superior Publishing Company.
- Bunting, R. (1995). The Environmental and Settler Society in Western Oregon. *The Pacific Historical Review*, 64(3), 413–432.
- Carleton, M. A. (1916). The small grains. In L. H. Bailey (Ed.), *The Rural Text Book Series* (pp. 570–571). New York, New York: The MacMillian Company.
- Chilcote, D. (1969). Burning fields boosts grass seed yield. *Crops Soils Magazine*, 21(8), 18.
- Coba, K. (2010). Collaboration and cooperation bring unity from diversity of farms. *Oregon Small Farm News*. Retrieved from [http://www.oregon.gov/ODA/do\\_speech\\_farm\\_size.shtml#Katy\\_Coba\\_article](http://www.oregon.gov/ODA/do_speech_farm_size.shtml#Katy_Coba_article)
- Colasanti, K. J. A., & Hamm, M. W. (2010). Assessing the local food supply capacity of Detroit, Michigan. *Journal of Agriculture, Food Systems, and Community Development*, 1(2), 41–58. <http://dx.doi.org/10.5304/jafscd.2010.012.002>
- Delind, L. (2006). Of bodies, place, and culture: Re-situating local food. *Journal of Agricultural and Environmental Ethics*, 19(2), 121–146. <http://dx.doi.org/10.1007/s10806-005-1803-z>
- Desjardins, E., MacRae, R., & Schumilas, T. (2010). Linking future population food requirements for health with local production in Waterloo Region, Canada. *Agriculture and Human Values*, 27(2), 129–140. <http://dx.doi.org/10.1007/s10460-009-9204-y>
- Dietz, D. (2009, August 12). Grass seed “death blow.” *The Register Guard*. Retrieved from <http://special.registerguard.com/csp/cms/sites/web/news/cityregion/18517320-41/story.csp>
- Dunne, J. B., Chambers, K. J., Giombolini, K. J., & Schlegel, S. A. (2011). What does “local” mean in the grocery store? Multiplicity in food retailers’ perspectives on sourcing and marketing local foods. *Renewable Agriculture and Food Systems*, 26(1), 46–59. <http://dx.doi.org/10.1017/S1742170510000402>
- Environmental Systems Research Institute (ESRI). (2008). ArcMap, Version 9.3. Redlands, California.
- Feagan, R. (2007). The place of food: Mapping out the “local” in local food systems. *Progress in Human Geography*, 31(1), 23–42. <http://dx.doi.org/10.1177/0309132507073527>
- Feenstra, G. (1997). Local food systems and sustainable communities. *American Journal of Alternative Agriculture*, 12(1), 28–36. <http://dx.doi.org/10.1017/S0889189300007165>
- Giombolini, K. J., Chambers, K. J., Schlegel, S. A., & Dunne, J. B. (Forthcoming). Testing the local reality: Does the Willamette Valley growing region produce enough to meet the needs of the local population? A comparison of agriculture production and recommended dietary requirements. *Agriculture and Human Values*.
- Guptill, A., & Wilkins, J. L. (2002). Buying into the food system: Trends in food retailing in the U.S. and implications for local foods. *Agriculture and Human Values*, 19(1), 39–51. <http://dx.doi.org/10.1023/A:1015024827047>
- Hanson, J., Dismukes, R., Chambers, W., Greene, C., & Kremen, A. (2004). Risk and risk management in organic agriculture: Views of organic farmers. *Renewable Agriculture and Food Systems*, 19(4), 218–227. <http://dx.doi.org/10.1079/RAFS200482>

- Hendrickson, M. K., & Heffernan, W. D. (2002). Opening spaces through relocalization: Locating potential resistance in the weaknesses of the global food system. *Sociologia Ruralis*, 42(4), 347–369. <http://dx.doi.org/10.1111/1467-9523.00221>
- Herrin, M., & Gussow, K. (1989). Designing a sustainable regional diet. *Journal of Nutrition Education*, 21(6), 270–275.
- Hinrichs, C. C. (2000). Embeddedness and local food systems: Notes on two types of direct agricultural market. *Journal of Rural Studies*, 16(3), 295–303. [http://dx.doi.org/10.1016/S0743-0167\(99\)00063-7](http://dx.doi.org/10.1016/S0743-0167(99)00063-7)
- Hinrichs, C. C. (2003). The practice and politics of food system localization. *Journal of Rural Studies*, 19(1), 33–45. [http://dx.doi.org/10.1016/S0743-0167\(02\)00040-2](http://dx.doi.org/10.1016/S0743-0167(02)00040-2)
- Ilbery, B., Watts, D., Simpson, S., Gilg, A., & Little, J. (2006). Mapping local foods: Evidence from two English regions. *British Food Journal*, 108(3), 213–225. <http://dx.doi.org/10.1108/00070700610651034>
- Kansas State University Extension. (1997). Wheat middlings: Composition, feeding values, storage guidelines. Retrieved from <http://www.ksre.ksu.edu/library/lvstk2/mf2353.pdf>
- Kingsolver, B., Hopp, S., & Kingsolver, C. (2007). *Animal, vegetable, miracle: A year of food life*. New York: HarperCollins Publishers.
- Lies, M. (2009, November 12). Growers abandon grass seed for wheat. *Capital Press: The West's Ag Website*. Retrieved from <http://www.capitalpress.com/orewash/ml-valley-wheat-111309-art>
- MacCormack, H., Kise, G., & Augerot, X. (2008). Local Foods Project Final Report. Retrieved from [http://www.mudcitypress.com/PDF/localfood\\_sprojectfinalreport.pdf](http://www.mudcitypress.com/PDF/localfood_sprojectfinalreport.pdf)
- Malone, C. (2010). Returning grain to the Lower-Willamette Valley: Prospects and barriers for local food security (master's thesis). Oregon State University, Corvallis, Oregon.
- Marsden, T. (1995). Beyond agriculture? Regulating the new rural spaces. *Journal of Rural Studies*, 11(3), 285–296. [http://dx.doi.org/10.1016/0743-0167\(95\)00027-K](http://dx.doi.org/10.1016/0743-0167(95)00027-K)
- Martinez, S., Hand, M., Da Pra, M., Pollack, S., Ralston, K., Smith, T., Vogel, S., Clark, S., Lohr, L., Low, S., & Newman, C. (2010). *Local food systems: Concepts, impacts, and issues*. Economic Research Report Number 97. Washington, DC: U.S. Department of Agriculture. Retrieved from <http://www.ers.usda.gov/Publications/ERR97/ERR97.pdf>
- Merlo, C. (2005). Going with the grain: New Mexico organic wheat cooperative provides lift to farmers, rural economy. *Rural Cooperatives*, 72(3), 12–14.
- Morris, C., & Buller, H. (2003). The local food sector. *British Food Journal*, 105(8), 559–566. <http://dx.doi.org/10.1108/00070700310497318>
- National Agricultural Statistics Service (NASS). (2007). *2007 Oregon cropland data layer*. Washington, DC: USDA, NASS Marketing and Information Services Office.
- National Research Conservation Service (NRCS). (2009). Soil Survey Geographic (SSURGO) database. Retrieved from <http://soils.usda.gov/survey/geography/ssurgo/>
- Oregon Department of Agriculture (ODA). (2007, Summer). Taiwan wheat deal good news for Oregon growers. *The Agriculture Quarterly*, 366, 6. Retrieved from [http://library.state.or.us/repository/2006/200611201108261/ODA\\_docs\\_pdf\\_pub\\_0707aq.pdf](http://library.state.or.us/repository/2006/200611201108261/ODA_docs_pdf_pub_0707aq.pdf)
- Oregon Department of Agriculture (ODA). (2008a). *Oregon agripedia*. Portland, Oregon: Oregon Field Office.
- Oregon Department of Agriculture (ODA). (2008b). *Smoke management program history*. ODA Natural Resources. Retrieved from <http://www.oregon.gov/ODA/NRD/smokeindex.shtml>
- Oregon Department of Agriculture (ODA). (2009a). *Growing regions*. Retrieved from <http://oregon.gov/ODA/regions.shtml#Map>
- Oregon Department of Agriculture (ODA). (2009b). *Oregon agriculture: Facts and figures*. Retrieved from <http://oregon.gov/ODA/docs/pdf/pubs/ff.pdf>
- Oregon Department of Agriculture (ODA) and National Agricultural Statistics Service (NASS). (2009). *Facts and figures*. Retrieved from <http://www.oregon.gov/ODA/statistics.shtml>
- Oregon Geospatial Data Clearinghouse. (2008). *GEO Spatial Data Library*. Retrieved from <http://oregon.gov/DAS/EISPD/GEO/sdlibrary.shtml>
- Oregon Legislative Assembly. (2009). Enrolled Senate Bill 528 (SB 528-B). Salem, Oregon: Office of Legislative Counsel.
- Oregon State University (OSU). (2009). *Willamette Valley field crops: Grass seed*. Retrieved from <http://oregonstate.edu/valleyfieldcrops/grass-seed>

- Oregon State University Extension Service (OSUES). (2008). Oregon Agricultural Information Network database (OAIN). Retrieved from <http://oain.oregonstate.edu/SignIn.asp>
- Pacific Northwest Ecosystem Research Consortium (PNW-ERC). (2002). *Willamette River Basin: Trajectories of environmental and ecological change*. Corvallis, Oregon: Oregon State University Press.
- Patton, M. (1990). *Qualitative evaluation and research methods*. Newbury Park, California: Sage Publications.
- Peters, C., Bills, N., Lembo, A., Wilkins, J., & Fick, G. (2008). Mapping potential foodsheds in New York State: A spatial model for evaluating the capacity to localize food production. *Renewable Agriculture and Food Systems*, 24(1), 72–84. <http://dx.doi.org/10.1017/S1742170508002457>
- Peterson, C. (2008). *Development of wheat varieties adapted to Oregon production with enhanced disease resistance, stress tolerance, and superior end use qualities*. Progress Report to the Agricultural Research Foundation and Oregon Wheat Commission. Retrieved from <http://cropandsoil.oregonstate.edu/wheat/report.htm>
- Pollan, M. (2006). *The omnivore's dilemma*. New York, New York: Penguin Press.
- Proehl, R. (2009). *2008 Oregon population report*. Portland State University: Population Research Center. Retrieved from <http://www.pdx.edu/prc>
- Rea, D. (2010, October 7). Small mills grind on to find new markets. *Capital Press: The West's Ag Website*. Retrieved from <http://www.capitalpress.com/content/dr-small-mills-w-art>
- Read, R. (2009, August 1). Oregon's grass seed farmers losing ground. *The Oregonian*. Retrieved from [http://www.oregonlive.com/business/index.ssf/2009/08/willamette\\_valley\\_jobless\\_in\\_o.html](http://www.oregonlive.com/business/index.ssf/2009/08/willamette_valley_jobless_in_o.html)
- Repko, M. (2009, July 17). Willamette Valley grass seed growers brace for a future without field burning. *The Oregonian*. Retrieved from [http://www.oregonlive.com/politics/index.ssf/2009/07/grass\\_seed\\_growers\\_in\\_willamet.html](http://www.oregonlive.com/politics/index.ssf/2009/07/grass_seed_growers_in_willamet.html)
- Ross, A. (2007). *Progress report to the Agricultural Research Foundation and Oregon Wheat Commission*. Retrieved from <http://cropandsoil.oregonstate.edu/wheat/report.htm>
- Selfa, T., & Qazi, J. (2005). Place, taste, or face-to-face? Understanding producer-consumer networks in “local” food systems in Washington State. *Agriculture and Human Values*, 22(4), 451–464. <http://dx.doi.org/10.1007/s10460-005-3401-0>
- Southern Willamette Valley Bean and Grain Project. (2010). Mud City Press. Retrieved from <http://mudcitypress.com/beanandgrain.html>
- Ten Rivers Food Web. (2010). Retrieved from <http://www.tenriversfoodweb.org/home/>
- United States Department of Agriculture (USDA). (2009a). *Wheat market outlook*. USDA: Economic Research Service. Retrieved from <http://www.ers.usda.gov/Briefing/Wheat/Background.htm>
- United States Department of Agriculture (USDA). (2010). *Wheat: Average price received by farmers, United States*. USDA: Economic Research Service. Retrieved from <http://www.ers.usda.gov/Data/Wheat/YBtable18.asp>
- United States Department of Agriculture (USDA) & National Agricultural Statistics Service (NASS). (2007). *Agricultural statistics*. Washington, DC: U.S. Government Printing Office.
- United States Department of Agriculture (USDA) & National Agricultural Statistics Service (NASS). (2010). *Data and statistics: Quick stats*. Retrieved from [http://www.nass.usda.gov/Data\\_and\\_Statistics/Quick\\_Stats/#top](http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats/#top)
- United States Department of Agriculture (USDA) & United States Department of Health and Human Services (USHHS). (2005). *Dietary guidelines for Americans*. Retrieved from <http://www.health.gov/DietaryGuidelines/dga2005/document/default.htm>
- United States Geological Survey (USGS). (1996). *Willamette basin ground-water study*. Retrieved from [http://or.water.usgs.gov/projs\\_dir/willgw/willdescrp.html](http://or.water.usgs.gov/projs_dir/willgw/willdescrp.html)
- Watts, D. C. H., Ilberry, B., & Maye, D. (2005). Making reconnections in agro-food geography: Alternative systems of food provision. *Progress in Human Geography*, 29(1), 22–40. <http://dx.doi.org/10.1191/0309132505ph526oa>
- Willamette Valley Farm and Food Coalition. (2010). Current projects: Bean and Grain Project. Retrieved from [http://www.lanefood.org/projects.php#bean\\_and\\_grain](http://www.lanefood.org/projects.php#bean_and_grain)
- Young, W. III. (2003). *Grass seed production in Oregon*. Oregon Seed Extension Program report. Retrieved from <http://cropandsoil.oregonstate.edu/seed-ext/publications/grass-seed-prod>





## Practicing food sovereignty: Spatial analysis of an emergent food system for the Standing Rock Nation

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### Abstract

Food sovereignty is understood as the right to determine food systems, and the ability to exercise this right requires the capacity to obtain, produce, and distribute culturally relevant foods. In the Standing Rock Nation of the northern Great Plains, efforts to reclaim food sovereignty include projects to increase the availability of gathered and gardened plants that are necessary components of traditional foods. Toward this objective, a voucher-based food assistance program administered by the Standing Rock Tribe is helping elders obtain

culturally meaningful foods while contributing to the growth of farmers' markets within the reservation. As program enrollment and market attendance increase, organizers are considering the spatial arrangement of food system components and its influence on accessibility and participation. Our GIS spatial analysis of voucher issuance and redemption patterns reveals that the minimum cost-distance to market explains 33% of variance in voucher redemption. In order to improve program equity and efficiency, cost-distance models are used to identify potential additional market locations that would reduce the effort associated with trips to market and thus encourage participation. These analyses and possible spatial solutions contribute a powerful tool to improve food-system planning and to enhance the food sovereignty of indigenous communities in rural areas.

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### Keywords

cost-distance analysis, farmers' markets, food security, food systems, GIS, indigenous, Lakota/Dakota, self-determination, Senior Farmers Market Nutrition Program, sociocultural and ecological relations, sovereignty

## Introduction

Indigenous peoples throughout the world experience the impacts of industrialized food systems on the health of their communities and their habitat. Increasing reliance on industrial food supplies negatively affects human health, local economic opportunities, and the availability of culturally significant foods (Johns & Sthapit, 2004; Kassam, 2009; Kuhnlein & Receveur, 1996). In response, many indigenous organizations are working to protect or recover systems that derive healthy and culturally meaningful foods from their landscapes (Kuhnlein, Erasmus, & Spigelski, 2009). Historically, Native Americans obtained the majority of their food through ecological relations within their landscapes. Colonialism has disrupted those relations by eliminating primary food sources, imposing new land tenure systems, and incentivizing production of commodities that require large-scale regional processing. As a consequence, many Native American communities in the United States cannot exercise cultural choice because contemporary food systems do not provide the foods that they value (LaDuke, 1999).

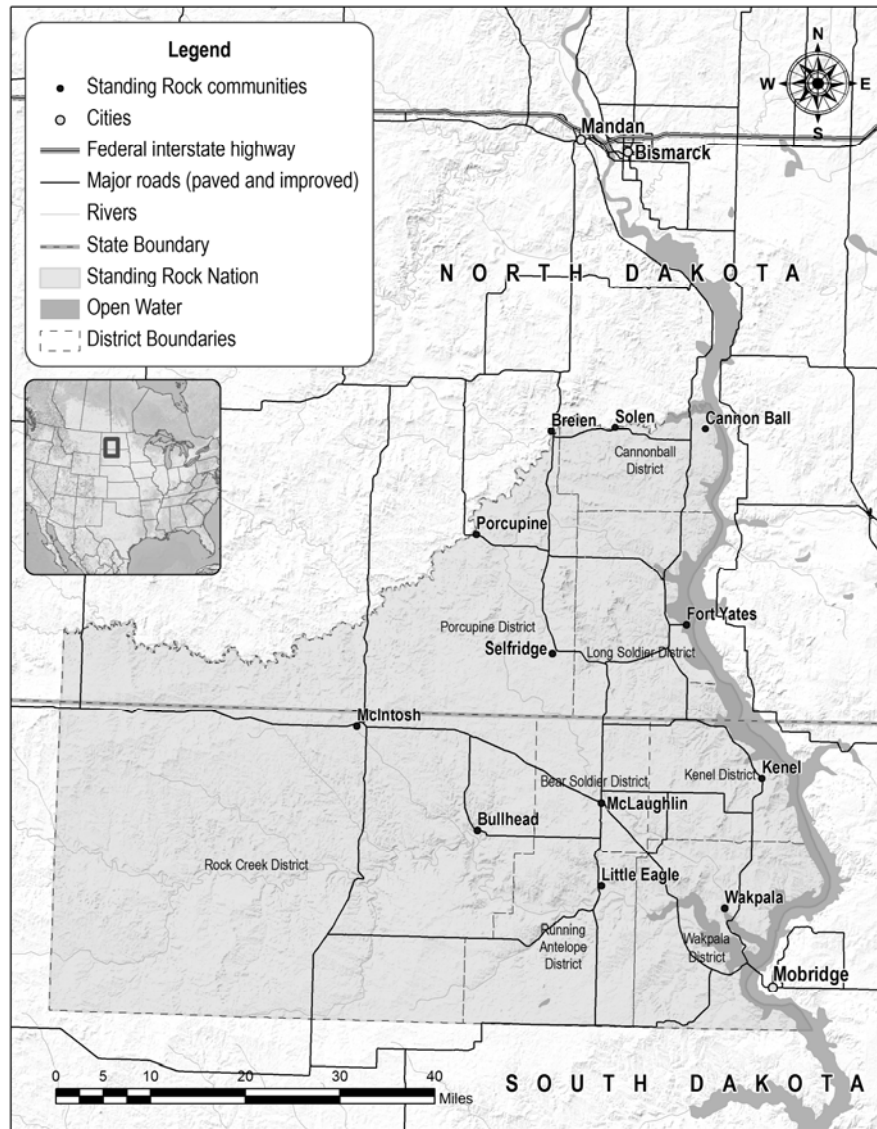
The international food sovereignty movement developed in response to the trade agreements, state policies, and corporate practices that reinforce the hegemony of global- and industrial-scale food production and distribution systems (Windfuhr & Jonsén, 2005). The notion of food sovereignty was first articulated by the global coalition of peasants, small farmers, agricultural laborers, and indigenous peoples known as *Via Campesina* at the 1996 World Food Summit in Rome (Menezes, 2001). *Via Campesina* defined food sovereignty as the “right of each nation to maintain and develop their own capacity to produce foods that are crucial to national and community food security, respecting cultural diversity and diversity of production methods” (Via Campesina, 1996). In protesting global trade structures, the food sovereignty movement has focused on food sovereignty as a right, but has also revealed its requirement for local capacities. The right to obtain, produce, and distribute food in accordance with community values is irrelevant if communities do not know how to do so. Indigenous food systems are enabled by context-specific

ecological knowledge (Kassam, 2009). In addition, knowledge generated through partnerships with research institutions can be used to strengthen and expand culturally appropriate and ecologically sustainable indigenous food systems (Kassam, Soaring Eagle Friendship Centre, 2001; Kassam, The Wainwright Traditional Council, 2001).

The food sovereignty movement is in many ways a reaction to the food security paradigm that has dominated development programs for the past 40 years (Shaw, 2007). Because food is understood as a volume of biochemicals, food security is achieved when people are consuming adequate calories and nutrients (Anderson & Cook, 1999). By comparison, food sovereignty advocates recognize that food emerges from complex sociocultural and ecological processes (Kassam, 2009). Food as a volume satisfies important metabolic needs, while food as a manifestation of culture and ecology reinforces the vital structure of communities (Kassam & The Wainwright Traditional Council, 2001). Recent revisions of the food security concept have included considerations of cultural food preferences and ecological sustainability (e.g., FAO, 2006), but still do not recognize the rights of nations and communities to determine their own food systems based on their ecological knowledge and with respect to their core cultural values (Kassam, Karamkhudoeva, Ruelle, & Baumflek, 2010; United Nations, 2008).

The word “sovereignty” has a complex history of use among Native Americans in the United States (Pevar, 2002). It is therefore important to consider how the multiple meanings of sovereignty may inform understandings of food sovereignty in Native communities. In conversations with elders from the Standing Rock Nation in the northern Great Plains, sovereignty is frequently described as an inherent right to self-determination that is recognized by treaties between the U.S. government and tribal representatives. On the other hand, some elders indicate that sovereignty must be asserted, and therefore requires tribal members to exercise capabilities or demonstrate specific rights. Sovereignty is also sometimes related to self-sufficiency or self-reliance, i.e., an ability to generate what is

**Figure 1. The Standing Rock Nation in the Northern Great Plains of the United States**



necessary for the well-being of the individual, the extended family (*thióspaye*), the community, or the nation. These complex local understandings of sovereignty have shaped the conceptualization of food sovereignty used in this paper, which highlights the rights and abilities of a person, community, or nation to make choices about their food system.

Applied research in the service of communities can contribute new knowledge to enhance their food sovereignty. In the narrative and analyses that

follow, we consider how innovative food assistance mechanisms coupled with the development of new farmers' markets can strengthen food sovereignty for indigenous communities. We combine qualitative research methods with geographic information systems (GIS) to assess the contributions of new markets to food sovereignty. We demonstrate that GIS is more than a technical tool, because it can support and increase local knowledge. In this regard, we add to the growing body of evidence that GIS can empower local organizations and marginalized social groups (Elwood, 2002). Specifically, as local knowledge drives the creation and transformation of sovereign food systems, the use of GIS can inform strategic placement of food system components to improve system equity.

### **Sociocultural and Ecological Context**

The Standing Rock Nation is located west of the Missouri River where it flows across the border between North

and South Dakota (see figure 1). The reservation encompasses 2.3 million acres (930,000 ha). In 2009, the population of Standing Rock was estimated at 8,290, of which 75% are Native American (U.S. Census Bureau, 2009a; 2009b). Most Native Americans living in Standing Rock are enrolled in the Standing Rock Sioux Tribe, which includes Dakota- and Lakota-speaking cultural groups (Ullrich, 2008). Fort Yates, North Dakota, is the seat of the tribal government, including the offices of the Tribal Chairman and the Tribal Council. The reservation is divided into eight administrative

districts, each of which elects a representative to the Tribal Council and a district chairperson who oversees district programs. Standing Rock districts own and manage community centers, social services, range and agricultural lands, cattle operations, and bison herds.

Prior to the middle of the nineteenth century, the food sovereignty of Dakota and Lakota people was well established, even though the right to hunt in certain areas was often challenged by other Native groups (Standing Bear, 1975). The ability to hunt, gather, grow, and distribute food required regular adaptations of ecological knowledge in response to environmental change, for example during the Little Ice Age and upon the arrival of Spanish horses. As settlers moved into the Great Plains, Native leaders negotiated a series of treaties with the U.S. government that promised the protection of specific rights within newly delimited territories (Smith, 1981). However, when conflict between Plains tribes and the U.S. government escalated in the 1860s and 1870s, the frontier Army led a systematic campaign to eliminate the bison herds on which tribes throughout the region relied. U.S. military leaders recognized that the political sovereignty of Native groups was strengthened by their ability to feed themselves, and bison were targeted as their primary food supply (Smits, 1994).

Following forced removal of the Dakota and Lakota to reservations, agents from the Office of Indian Affairs required that Standing Rock families adopt European-American farming systems. Although these agents claimed to promote the self-sufficiency of Native peoples, they worked to replace traditional modes of food production with farming technologies that would prove unreliable in the drought-prone northern Great Plains (Pfaller, 1992). As these farming systems failed to support Native families, reliance on military rations led to widespread dependencies on food assistance programs by the early twentieth century (Jackson, 1994).

Nevertheless, according to elders living today, most Standing Rock families continued to grow, gather, and hunt much of their own food into the 1950s.

Floodplain forests were the primary sources of food, medicine, fuel, and fiber. In 1959, despite the protestations and legal actions of the Standing Rock tribal government, the U.S. Army Corps of Engineers completed the Oahe Dam on the main stem of the Missouri River, which permanently inundated 55,993 acres (22,660 ha) of Standing Rock land and forced the relocations of over 200 families (Kraft, 1990; Lawson, 1994). GIS analysis indicates that these losses represented half of all forests on Standing Rock (Ruelle, 2011). Although some important plants and animals remained in wooded ravines and upper reaches of the Missouri's main tributaries, the Oahe Dam drastically reduced opportunities for families to grow, gather, and hunt the plants and animals that are critical to their food culture, social systems, and physical health.

The continued erosion of food sovereignty has had alarming consequences for the health of Standing Rock communities. A needs assessment conducted by Standing Rock Nutrition for the Elderly and Caregiver Support (NFE) and the Standing Rock Elder Advisory Council confirmed that Standing Rock elders (those aged 60 and older) are suffering from high rates of diet-related diseases (NFE, 2007). For example, the incidence of Type II diabetes among Standing Rock elders is twice the national average (46% as compared to 23%; CDC, 2007). Despite the prevalence of diet-related diseases, interviews reveal that most elders do not follow diets prescribed by their doctors. Elders often stated that the recommended foods are unfamiliar or the dietary restrictions are culturally inappropriate. Many elders say that consuming traditional foods would improve their health, but report that their consumption of those foods has declined. Seventy-one percent of elders say they know how to gather plants they need to prepare traditional foods (NFE, 2007), but many are physically not able to do so. Elders' ecological knowledge is a vital asset on Standing Rock, and some are teaching younger people to gather and use non-cultivated plants from their landscape (Ruelle & Kassam, 2011).

The lack of local distribution systems for culturally meaningful and ecologically sustainable foods is an impediment to the restoration of food sovereignty. Although the Standing Rock landscape is home to a diversity of plant and animal foods, only a small percent is distributed to local markets where it is available to elders. Instead, crops and livestock raised in Standing Rock are delivered to local storage facilities from which they are sold into regional and national distribution networks; Standing Rock residents rely on grocery and convenience stores that market food from the same networks. In 2009, small grocery stores were located in Fort Yates, McLaughlin, and McIntosh; convenience stores were located in Fort Yates, McLaughlin, Cannon Ball, Selfridge, and Bullhead (see figure 1). Some of these stores sell a small volume of locally grown vegetables during gardening seasons, but the majority of fresh fruits and vegetables sold in Standing Rock is grown in other regions of the United States, Canada, and Mexico. Many elders therefore lack access to the locally grown and gathered foods that they need to prepare traditional foods.

With the principal objective of expanding access to these healthy and culturally significant foods, NFE applied to the USDA Food and Nutrition Services to initiate a Senior Farmers Market Nutrition Program (SFMNP) in Standing Rock. SFMNP is a national program administered by state and tribal agencies that provides low-income elders and their spouses with vouchers that can be exchanged for fresh, unprocessed, locally grown fruits, vegetables, and herbs at authorized farmers' markets, roadside stands, and community-supported agriculture operations. In 2008, NFE became the fifth tribal agency in the United States to receive federal funding for an SFMNP. The program administered by NFE allows elders to exchange vouchers for many of the noncultivated plants they use to prepare traditional foods. The inclusion of these plants as eligible foods expands economic opportunities for local gatherers as well as small-scale farmers and gardeners.

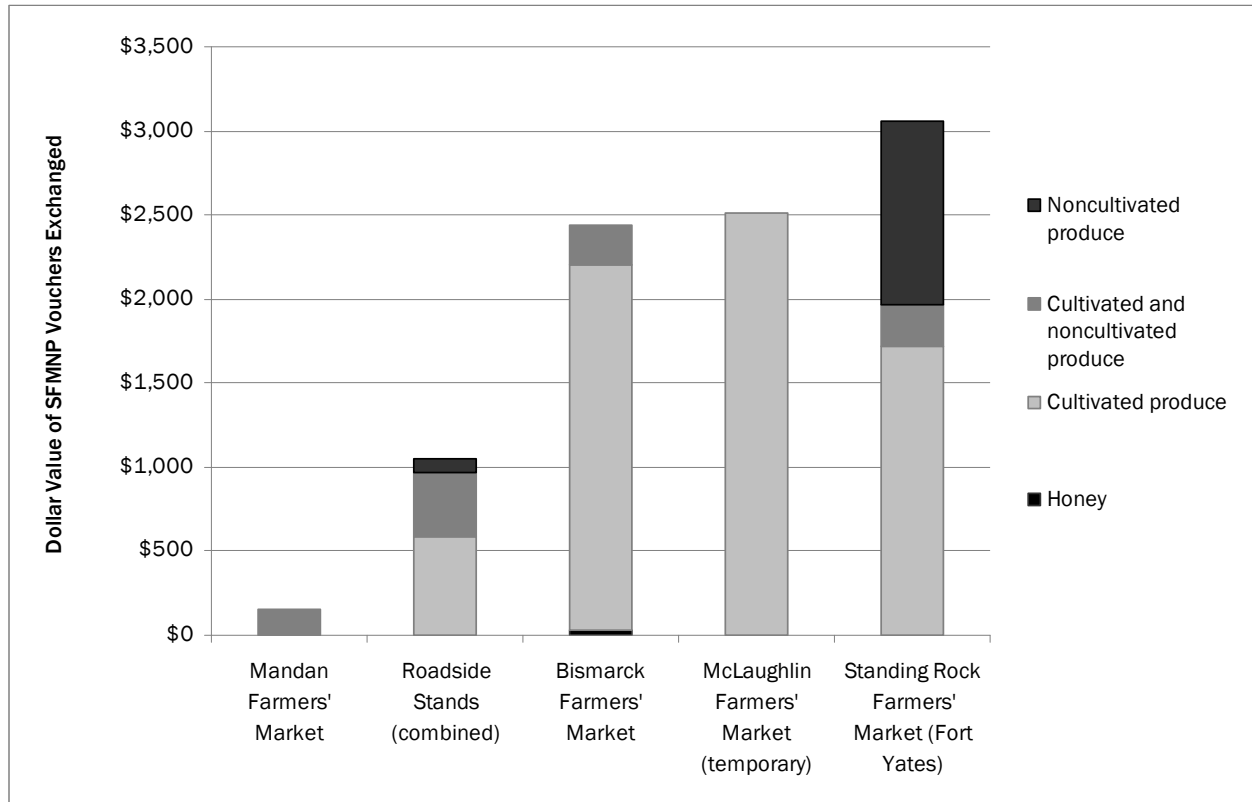
In addition to issuing SFMNP vouchers to elders, NFE authorizes farmers' markets and individual

vendors to exchange the vouchers for produce. In 2009, NFE authorized 36 vendors operating at four farmers' markets and four roadside stands. At first, the only farmers' market located within Standing Rock was in Fort Yates, North Dakota. NFE collaborated with the Native Gardens Project (NGP) of the Standing Rock Diabetes Program and Sioux County Cooperative Extension (SCCE) to improve and expand this market. The market had opened in 2007, but vendor participation waned in 2008. Market organizers and vendors attributed this decline to a change in organizational leadership and low market attendance because families could not afford the produce. In 2009, organizers anticipated that the new SFMNP vouchers would infuse money into the Standing Rock Farmers Market and increase vendor attendance and profitability.

Although the market in Fort Yates is close to the largest population of elders, NFE and partners envision a food system that increases market access for the other administrative districts. Disparities in access are a concern due to local perceptions that communities located farther from Fort Yates receive fewer services provided by tribal government agencies. In August 2009, NFE observed that voucher redemption rates in the southern districts of Standing Rock had been significantly lower than in districts closer to Fort Yates, and decided to organize an opportunity to exchange vouchers closer to those districts. NFE established a temporary market in McLaughlin, South Dakota, and provided travel funds for a vendor to sell vegetables there for two days in August and October. During those two days, elders exchanged as many vouchers in McLaughlin as they ultimately exchanged at the much larger market in the city of Bismarck over the course of the entire season (see figure 2).

Following these successes, NFE and its partners are looking for ways to strengthen and expand the Standing Rock food system through the SFMNP and other programs. The goal of our research is to contribute to these continued efforts to restore the food sovereignty of Standing Rock. First, based on our observations of market activity and conversa-

**Figure 2. Dollar Value of SFMNP Vouchers Redeemed With Reference to Category of Produce**



tions with both elders and vendors, we evaluate the contributions of the Standing Rock Farmers Market to food sovereignty. Second, we analyze patterns of SFMNP voucher redemption to determine if costs associated with travel to market affect voucher redemption rates. Third, we compare potential additional market locations and their ability to improve program equity by reducing travel costs for participating elders and vendors. Our broader aim is to develop models that anticipate the success of new farmers markets in rural landscapes where access to fresh, healthy, and culturally significant foods is limited by the lack of local distribution systems.

### Applied Research Methods

From February 2007 to February 2008, the first author served as an Americorps VISTA volunteer in Standing Rock. In partnership with the NFE director and staff, he helped conduct the needs assessment of elders as well as develop the original proposal for the Standing Rock SFMNP. He then

returned to Standing Rock in 2009 to assist with voucher program implementation and market development. The data collected during this period are the foundation for the current analyses. Qualitative data about the sociocultural and ecological significance of the Standing Rock Farmers Market were obtained through participant observation, including informal conversations with participating elders and vendors. Quantitative data about voucher issuance and redemption were obtained through a data-sharing agreement with NFE. The names of elders and vendors were replaced with alpha-numeric codes to ensure their anonymity.

SFMNP procedures allow each voucher to be traced from its issuance in a specific district to its redemption at a particular market or roadside stand. Specifically, each voucher is printed with a 6-digit identifier that can be used to determine the district where it was issued. NFE provides each vendor with a stamp that includes a unique vendor number. Whenever a program participant

exchanges a voucher, the vendor signs, dates, and stamps it before submitting it to NFE for payment. Vendor numbers stamped on each voucher are associated with specific locations because no vendor operates at more than one market or roadside stand. Therefore, the locations of voucher redemptions can be tracked and spatially analyzed in a GIS database.

With the knowledge of origins and end-points of each voucher, it was possible to estimate the distance traveled as well as the cost or difficulty of travel by elders to markets. Cost-distance analysis is a spatial-analytical method for measuring the costs associated with movement across a variable landscape. Frequently used to model movement of plants and animals (e.g., Adriaensen et al., 2004), this method has been employed in previous studies of human access to food (Hallett & McDermott, 2010). First, a cost-surface grid was generated for the Standing Rock landscape. Each cell in this grid was assigned a value according to the relative difficulty of travel in that cell. Because most elders and vendors drive to markets, cost was modeled relative to travel on paved roads. Cells with gravel roads or without any roads were assigned higher cost values.<sup>1</sup> Second, the cost-distance tool in Spatial Analyst (ESRI ArcGIS 9.3) was used to produce a series of cost-distance maps. Using the values in the cost-surface grid, the cost-distance tool calculated the minimum cumulative cost-distance from all points in the landscape to a specified destination, in this case a farmers' market. Cost-distance maps were generated for each existing and potential market location in order to compare the cost-distances to those locations from districts and communities.

An analysis of independent trips to market was necessary to investigate whether cost-distance to market shaped patterns of voucher redemption. All

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<sup>1</sup> Cells with paved roads were assigned a value of 1, cells with gravel roads a value of 1.33 (based on an estimated average speed of 60 miles/hour on paved roads ÷ 45 miles/hour on gravel roads), and cells without roads a value of 30 (based on an average speed of 60 miles/hour on paved roads ÷ 2 miles per hour when traveling by foot).

vouchers exchanged by the same household at the same market on the same day were assumed to be redeemed during the same trip. However, because the database was coded for anonymity, the precise starting point of each trip was unknown. The cost-distance per trip was therefore calculated as the minimum cost-distance from a district (a polygon) to the market where the voucher was exchanged (a point).<sup>2</sup> In addition, the minimum cost-distance to any of the existing markets was also calculated for each district. Redemption rates per district were then calculated as the number of vouchers redeemed divided by the total number of vouchers issued for each district.

New maps depicting cost-distances were created to analyze the effects of potential new markets on minimum cost-distance values. These maps were used to assess spatial overlap of cost-distance radii from proximate markets and to provide an effective visual reference for decision-makers. Cost-distances from communities to potential new market locations were compared with cost-distances to the existing market in Fort Yates and the temporary market in McLaughlin. In addition, counts of eligible persons in each community were obtained from NFE to predict the average minimum cost-distance to any market for all participants following the establishment of new markets. The average minimum cost-distance to market for all participants in all communities ( $CD_{avg}$ ) was calculated as follows:

$$CD_{avg} = \frac{\sum_{i=1}^n (P_i \cdot CD_i)}{\sum_{i=1}^n P_i}$$

Where  $P_i$  is the count of eligible persons in community  $i$ ,  $CD_i$  is the minimum cost-distance from community  $i$  to any market, and  $n$  is the total number of communities in Standing Rock.

To complement the analysis of elders, it was important to consider whether vendors are able to

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<sup>2</sup> This calculation is therefore based on the minimum cost-distance from any point within the district polygon to the destination market. This point will always be located on the edge of the polygon. Trips made within the same district were assigned a cost-distance of 0.

attend markets in terms of their numbers and locations. The locations of authorized and potential vendors were obtained through a data-sharing agreement with NGP. Authorized vendors had already participated in the SFMNP in 2009, whereas those designated as potential vendors had participated in other NGP-supported projects in 2009 and are therefore likely to operate at local markets in the future. The numbers of vendors located less than 20 cost-distance units from each existing and potential market were tabulated for analysis.

### Results

The success of local organizations in promoting food sovereignty can be evaluated in terms of observable changes in the food system that reflect local decision-making processes, as well as increased opportunities for communities to engage and expand their food systems according to their own values, concerns, and knowledge of their habitat. In this regard, the voucher program and the establishment of new farmers' markets are both indicators of and contributions to food sovereignty.

By the end of the 2009 harvest season, 347 individuals from 194 households (representing approximately 71% of eligible residents) had each received US\$50 worth of SFMNP vouchers. Thirty-six vendors operating at four farmers' markets and four individual roadside stands were authorized to accept SFMNP vouchers in exchange for fresh local produce. The greatest number of vouchers (18% of all those issued) was redeemed by vendors at the Standing Rock Farmers Market in Fort Yates. Whereas other markets offered primarily cultivated fruits, vegetables and herbs, at least 36% of voucher redemptions at the Standing Rock Farmers Market were for noncultivated plants (see figure 2). Noncultivated plants included *thiypsijla* (prairie turnip, *Pedimelum esculentum*), buffalo berries (*Shepherdia argentea*), wild plums (*Prunus americana*), chokecherries (*Prunus virginiana*), and sand cherries (*Prunus pumila*). These five plants are of significant cultural value because they are used to prepare a number of traditional foods.

A farmers' market is an important node within economic networks of supplies and demands, and also in the social-ecological networks through which knowledge is transmitted and transformed. Our observations and conversations at the Standing Rock Farmers Market indicate that the social impacts of voucher exchanges were remarkable. Elders said that their visits to the farmers' market resulted in strengthened and expanded relations with other elders, gatherers, and gardeners. Even after their SFMNP vouchers had been exchanged, elders continued to attend the Standing Rock Farmers Market to observe market activity and to socialize. The market became an important place for elders to connect with their community and share their knowledge about traditional foods.

The market also provided opportunities for vendors to share ecological knowledge with each other. Ethics are an implicit dimension of ecological knowledge, and communities of gatherers affirmed their shared commitments to the conservation of plants. More experienced gatherers emphasized the importance of specific practices to conserve plants, and shared knowledge about how to do so. For example, gatherers spoke about the importance of digging *thiypsijla* in such a way that the ground is undisturbed and the inflorescence remains upright so that seeds can still disperse. As ecological knowledge moves within social relations at a market, the community learns how to sustain the relations with plants that are critical to food sovereignty.

The Standing Rock SFMNP introduces a relatively small amount of money into the local food economy, but has already provided 14 Standing Rock residents and their families with supplemental income from gardening and gathering. The SFMNP acts as more than just a food assistance program. It relies upon ecological knowledge within communities to access culturally meaningful foods for those who otherwise cannot afford them. As a result, vendors gain skills and confidence in their ability to earn money through gathering and gardening, and local capacity for food sovereignty is further enhanced.



Conversations with Standing Rock vendors revealed that they are motivated by more than money to gather or grow foods. They describe their work as a service to communities because they provide foods that are often otherwise unavailable. As they interact with their communities during voucher exchanges and cash sales, vendors share significant knowledge about traditional foods and the cultural values they represent. In addition, face-to-face interactions with elders offer vendors insight into the multiple dimensions of demand for food that give their work meaning. Although we should be careful to not downplay vendors' financial objectives, to simplify their motivations to an economic calculus would under-

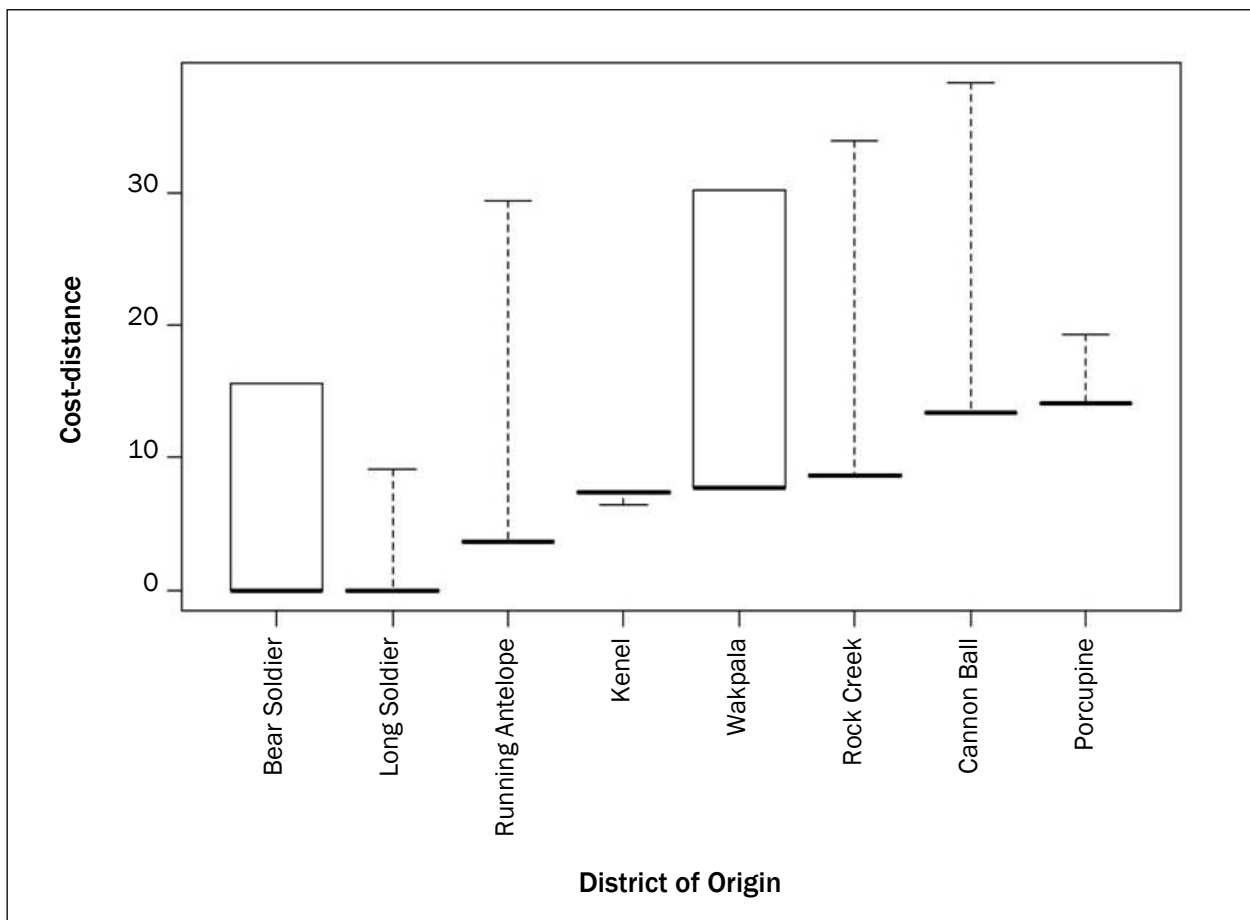
estimate their intellectual, emotional, and spiritual contributions to community well-being.

*Cost-distance as a predictor of voucher redemption*

The percent of eligible residents who joined the voucher program was fairly consistent among districts, ranging from 65% to 86% (mean 73%  $\pm$ 6.7 SD). Despite the relatively even distribution of vouchers, the percent that were redeemed by participants was more variable, ranging from as low as 28% in Porcupine District to as high as 70% in Running Antelope District (mean 50%  $\pm$ 12.0 SD).

Analysis of trips to redeem vouchers within Standing Rock revealed that residents traveled only the

**Figure 3. Cost-distance Per Trip to Market (N=277) Made by Voucher Recipients**



Most trips were made to the minimum cost-distance. Cost-distance is a measure that incorporates the distance and difficulty of travel. In this figure, bars represent medians, boxes represent interquartile ranges, and whiskers represent minimum and maximum cost-distance values for trips.

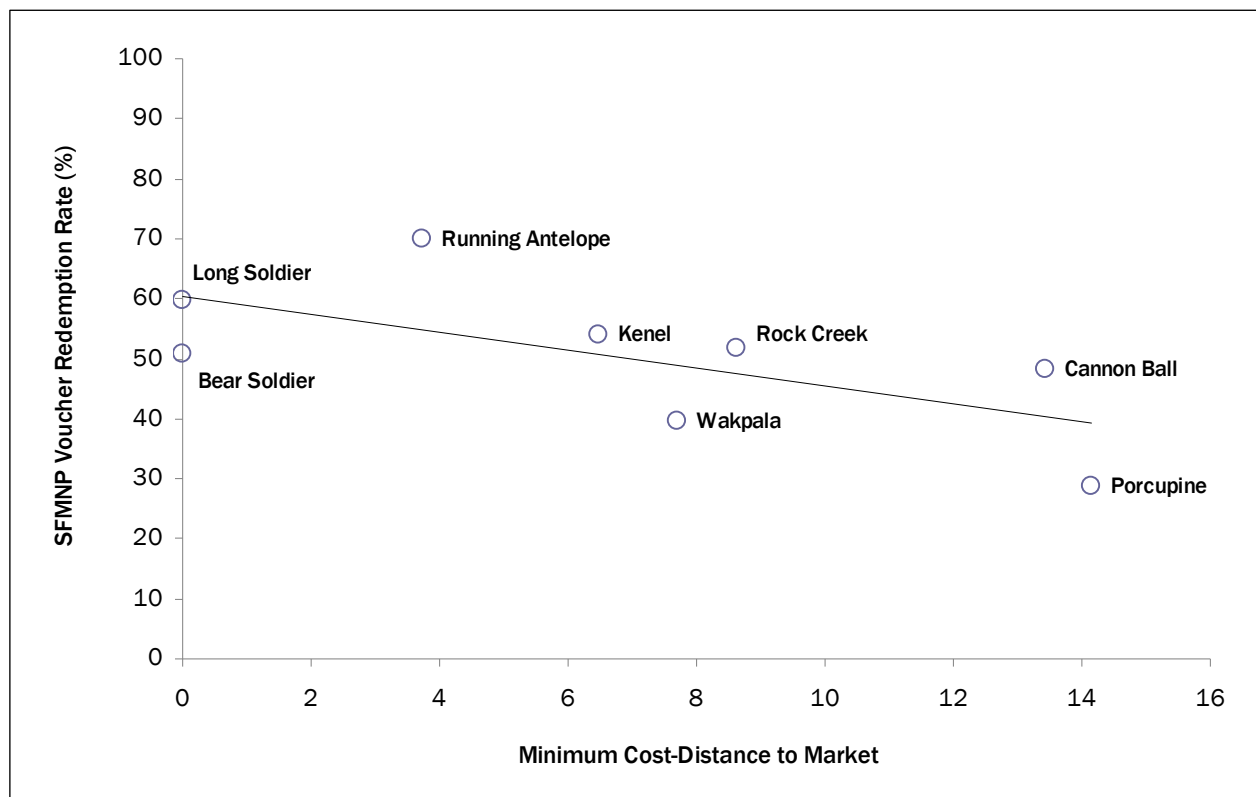
minimum cost-distance for the majority of trips (see figure 3). The minimum cost-distance to a market from each of the districts ranges from 0 (Bear Soldier and Long Soldier districts) to 14.2 (Porcupine District). In all but one district the median cost-distance per trip is equal to the minimum cost-distance, indicating that at least 50% of trips were made to the nearest market.

Comparison of voucher redemption rates among districts confirmed that distance and difficulty of travel are important determinants of program impact (see figure 4). Analysis per district showed that as cost-distances increase, redemption rates decreased. Based on a simple linear regression analysis, cost-distances to the nearest markets explain more than one third of the variance in SFMNP voucher redemption rates between districts ( $r^2 = 0.3348$ ,  $p = 0.07757$ ). Notably, three of the four districts with the highest minimum cost-distance values experienced the lowest redemption rates.

*Analysis of potential new market locations*

As a means to analyze potential market locations, cost-distance calculations in GIS confirmed that a permanent farmers' market located in McLaughlin would reduce the minimum cost-distance to a market for residents of Bullhead, Little Eagle, McIntosh, Mobridge, and Wakpala, as well as McLaughlin itself, which is currently the second largest population of SFMNP participants. In addition, the 20-mile cost-distance radius illustrated for a McLaughlin market shows relatively little spatial overlap with the same cost-distance radius for the Standing Rock Farmers Market in Fort Yates (see figure 5), indicating complementarity rather than redundancy. Our predictions for success are supported by empirical evidence: the temporary market in McLaughlin resulted in more voucher exchanges during two market days than the much larger market in Bismarck achieved during 106 market days (see figure 2).

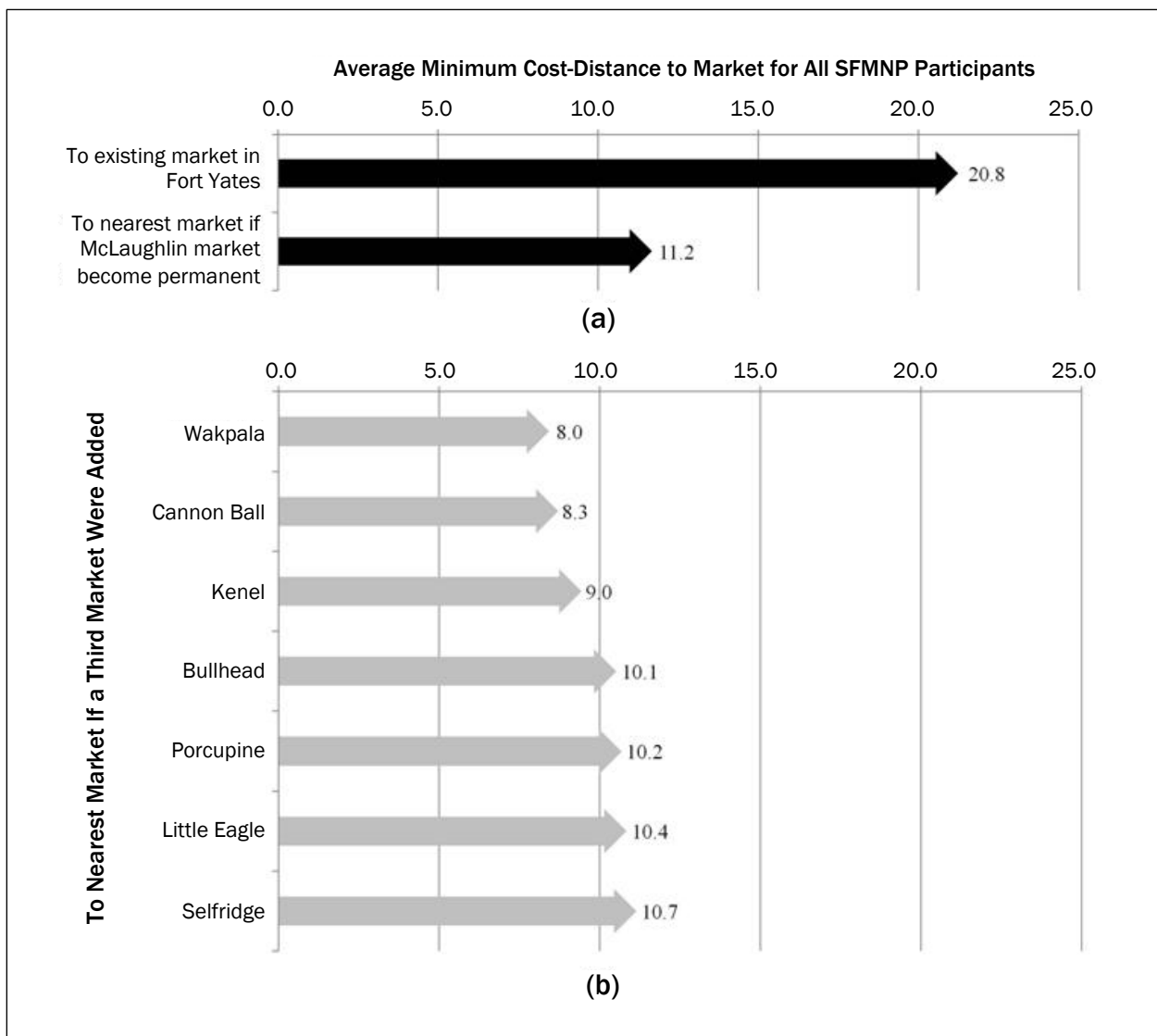
**Figure 4. Effect of Minimum Cost-Distance to Market on Voucher Redemption Rates**



Given the likely success of a market in McLaughlin, further analysis compared potential locations for a third market, assuming that the market in McLaughlin will have been made permanent. Undoubtedly, determining which SFMNP participants have the highest remaining cost or difficulty of travel to market could help organizers address program equity. If organizers are concerned about elders who live farthest from markets and experience the most difficulty traveling to them,

they will consider supporting a new market in the communities farthest from Fort Yates and McLaughlin. On the other hand, the population eligible to participate in the SFMNP is low in many of these communities, so the number of participants served would be small. Of the communities that are furthest from Fort Yates and McLaughlin, only Porcupine, Wakpala, and Cannon Ball have more than 10 elders who are eligible for the SFMNP.

**Figure 5. Predicted Changes in Average Cost-Distance to Market Following the Addition of New Markets**

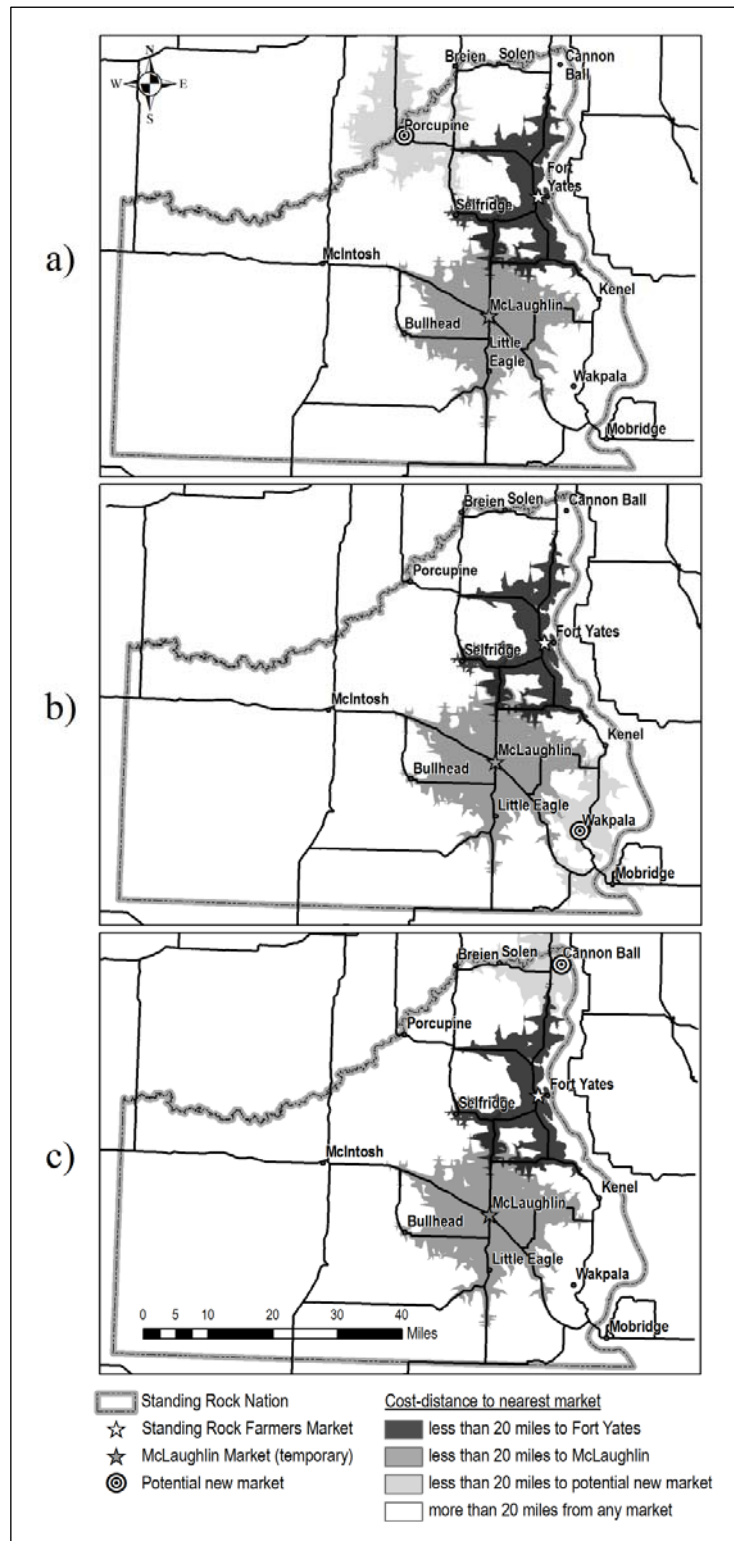


(a) Making the existing market in McLaughlin permanent results in a substantial reduction of average minimum cost-distance. (b) Adding a subsequent third market yields further reductions; as a single third market, Wakpala would reduce the average minimum cost-distance the most.

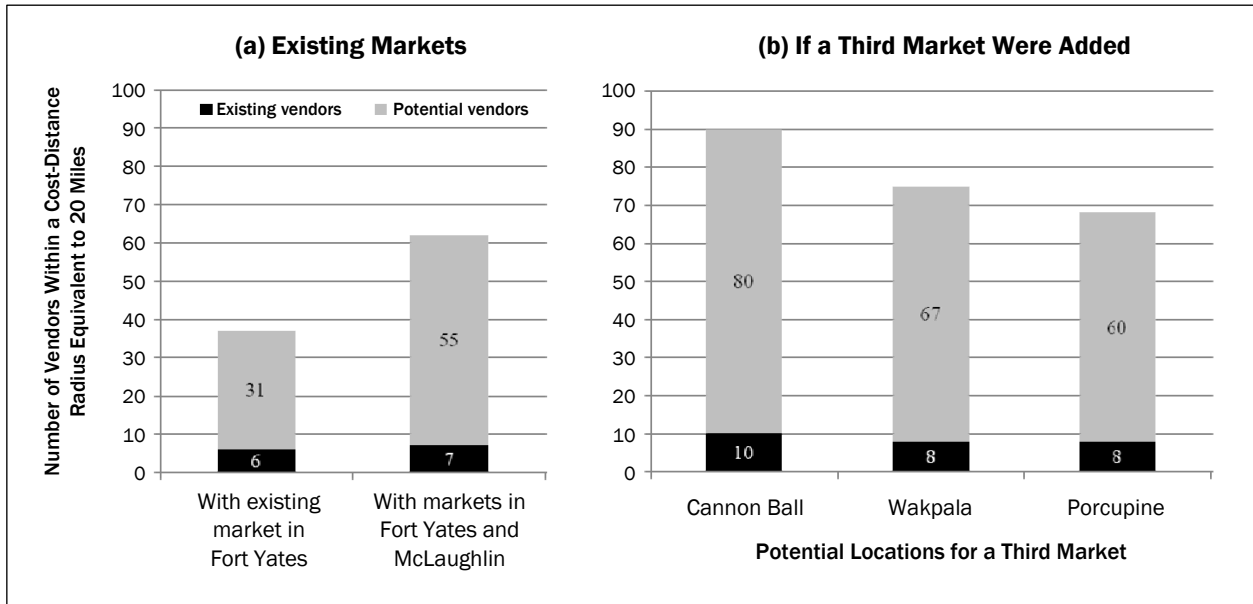
A new market in one community can reduce the minimum cost-distances for elders traveling from other communities. Therefore, in order to locate a market that would improve the food system for the most elders, it is important to account for the number of eligible elders in each community as well as the distance and difficulty of travel to new markets from all other communities. Based on the number of elders in each community, the average minimum cost-distance to market for all participants in all communities was calculated to examine the effects of new markets (see figure 5). Presently, the average minimum cost-distance to market for all participants in all communities was calculated to examine the effects of new markets (see figure 5). Presently, the average minimum cost-distance to market for all participants to the market in Fort Yates is 20.8, and a permanent market in McLaughlin is predicted to reduce that figure by 46% (see figure 5a). Assuming the temporary market in McLaughlin becomes permanent, we compared average minimum cost-distance to market for all participants if a subsequent third market were established in any other community (see figure 5b). Using these straightforward spatial tools, we calculated that the greatest changes in average minimum cost-distance for all participants are predicted to result from a new market in either Wakpala or Cannon Ball. These reductions are less than those achieved by the market in McLaughlin, but either market would increase market accessibility for multiple remote communities (see figure 6). Unfortunately, neither of these markets would reduce the cost-distance to market for elders in Porcupine, so the low voucher redemption rates in that community are not predicted to improve as a result of those new markets.

For vendors, analysis of cost-distances showed that individuals who were authorized to accept SFMNP vouchers at the Standing Rock Farmers Market live at cost-distance radius values between 0 and 42 from that market (mean=18 ± 14.9 SD). Six authorized vendors and 31

**Figure 6. Comparison of Changes in Cost-Distances to Market with the Addition of Markets in (a) Porcupine, (b) Wakpala, and (c) Cannon Ball Communities**



**Figure 7. The Effect of Market Placement on Number of Vendors**



(A) If the existing market in McLaughlin is made permanent, the number of potential vendors within a cost-distance radius of 20 would increase substantially. (B) A market in Cannon Ball would yield the greatest increase if a single third market were added.

potential vendors (NGP participants) live within a cost-distance radius of 20 miles from the market in Fort Yates (see figure 7). The number of authorized vendors living within that radius increases by only 1 with the addition of the McLaughlin market, but the number of potential vendors increases by 68%. From the same standpoint, a new third market in Cannon Ball would have the highest number of authorized and potential vendors within a cost-distance radius of 20 miles.

### Discussion

In 2009, voucher redemption rates were highly variable between districts, and we believe that part of this variability can be explained by differences in the effort required to travel to a market. New markets in districts with low redemption rates are expected to increase redemption in those districts and improve food system equity. Indeed, empirical evidence confirms this prediction: the temporary market in McLaughlin accounted for most of the voucher redemptions by elders living in Bear Soldier District (almost 75%). Following this logic, Porcupine community is an appropriate location

for a third market because Porcupine district had the lowest voucher redemption rate (29%) in 2009.

Although locating markets in the districts with the lowest redemption rates may address program inequities by locating new markets in the most remote communities, some of these improvements have an effect on only a small number of elders. An alternative approach is to assess the distribution of eligible participants and the spatial relationships between new markets and other communities in order to reduce the average distance and difficulty of travel for all SFMNP participants. For example, the temporary market in McLaughlin reduced the minimum cost-distance to market for six communities and therefore cut the average cost of travel for everyone in half. Based on this approach, we predict that a third market in Wakpala or Cannon Ball would result in the greatest increase in voucher redemption rates due to reductions in cost-distance to market for the most SFMNP participants. Wakpala has the third largest population of elders and one of the highest cost-distances to a market, and a new market in Wakpala would reduce travel

costs for Kenel and Moberge elders as well as Wakpala residents. Similarly, Cannon Ball has the same number of elders as Wakpala and a high minimum cost-distance to market. A market in Cannon Ball would also reduce the minimum cost-distances from the remote communities of Solen and Breien. It is important to reiterate that neither market location would reduce the minimum cost-distance to market from Porcupine District, so an additional strategy is warranted to serve that community.

In addition to improving food system access for elders, NFE and its partners also aim to increase opportunities for gardeners and gatherers, so new markets locations need to take the spatial distribution of vendors into account. Cost-distance analysis for vendors indicates that the market in Fort Yates benefited from a large number of authorized and potential vendors within a 20-mile cost-distance radius. A permanent market in McLaughlin would require participation by new vendors, because only one previously authorized vendor lives within the designated radius. As for a third market, Cannon Ball community shows the greatest number of authorized and potential vendors living within a 20-mile cost-distance radius. An important caveat is that this analysis does not include gatherers because potential vendors were identified through their participation in gardening projects.

We have focused on readily measurable factors so that NFE, local organizational partners, and community members can interpret and utilize this research. Furthermore, the measures we have considered can be monitored within an adaptive approach to food system development. For example, we have based much of our analysis on the assumption that a permanent market is established in McLaughlin. Unforeseen circumstances may make this not feasible, and cost-distances would need to be recalculated following the addition of other markets. To that end, local organizations now have the analytical tools necessary to do so. In any case, the spatial arrangement of markets will have a bearing on the growth of the food system and sovereignty in Standing Rock.

The findings shared here should not be interpreted as specific recommendations, but rather as a set of tools and examples that can be applied now or in the future to inform decisions about new market locations. The analyses of redemption rates and minimum cost-distances are a few of multiple approaches that might anticipate the spatial concerns of organizations administering an SFMNP or similar program. We provide evidence that a permanent farmers' market in McLaughlin would succeed in increasing SFMNP voucher redemption rates, both within Bear Soldier District and reservation-wide, by reducing minimum cost-distances to market for a significant number of people in several communities. An important caveat to this finding is the low number of previously authorized vendors living in close proximity to McLaughlin; local organizations need to promote the McLaughlin market among potential vendors living in Bear Soldier and proximate districts. A third market in Porcupine would address the lowest SFMNP voucher redemption rates and the highest minimum cost-distances from a community to a market. If the goal is to reduce the minimum cost-distance for the most program participants (and therefore increase redemption rates reservation-wide) our analysis indicates the greatest benefits would come from a third market in either Wakpala or Cannon Ball. If markets are located based on the number of vendors available to participate, Cannon Ball has the greatest number of authorized and potential vendors within a specific cost-distance radius of the community. Because the latter analysis is limited to gardeners, further research is necessary to assess the spatial distribution of gatherers, as well as the plants and animals upon which they rely.


Although distance and difficulty of travel clearly impact food-system equity, it is important to consider other factors that may affect voucher redemption. For example, in the community of Little Eagle (Running Antelope District), two elders promoted the SFMNP and ensured that other elders in their community were aware of market days and program benefits. In a relatively small community, the actions of two motivated individuals likely contributed to what were the highest par-

ticipation and redemption rates in the Standing Rock SFMNP. In addition to community awareness and leadership, other differences between districts might affect participation and redemption rates, including the percent of people commuting to market sites to engage in other activities; access to district-owned vehicles that can transport groups of elders to markets; or the existing availability of garden produce from generous neighbors. Differences between markets also affects participation, particularly the diversity, quality, and quantity of produce available. The abundance of culturally valuable plants garnered consistent attendance at the farmers' market in Fort Yates.

We have not identified all the options to address the issues revealed here; innovative solutions may involve rotating market sites, subsidizing transportation to existing markets, or increasing the number of roadside stands in certain communities. These approaches should be considered as complementary strategies. In addition, we have not accounted for an increase in market participation by other community members (not voucher recipients) in response to new market placement. By a conservative estimate, SFMNP voucher exchanges accounted for at least 75% of sales at the markets in Fort Yates and McLaughlin. While this ensures the significance of our analysis, the federal funding that currently supports the voucher program could be reduced or withdrawn, in which case the current system might falter. Reliance on federal grants is not a reliable long-term strategy, but the influx of federal dollars has promoted rapid development of the technical skills and social-ecological infrastructures necessary for a food system that may sustain itself.

Food sovereignty is the inherent right, enduring capacity, and ecological possibility of individuals, communities, or nations to choose the food systems they generate and utilize. Food sovereignty as a right may not require localization of food systems, because communities may choose to draw on national or global networks for their food. But food sovereignty as a capacity requires that people know how to hunt, gather, grow, and distribute food. Industrial food systems rely on economies of

scale to distribute food to dispersed populations, but localized food systems must account for higher per-unit costs associated with the spatial arrangement of food system components. Hence, individuals and organizations participating in food systems must consider spatial relationships in determining the locations of food system enterprises. In rural areas the cost of travel to a market can easily exceed the benefits of vending or purchasing goods from that market. As fuel costs rise and the distances people are able or willing to travel decline, the spatial arrangement of food systems becomes critical. In this context, GIS offers a set of analytical techniques to inform decisions about the distribution of food systems in time and space. Cost-distances are one set of spatial measures that may prove useful in anticipating the success of markets at specific locations in the landscape.

Innovative food assistance programs can contribute to food sovereignty by investing in local capacities. Within the United States, the SFMNP represents an unusual opportunity for tribal governments to expand food sovereignty in partnership with a federal agency. To a limited extent, NFE is able to assert food sovereignty within the federally regulated SFMNP by proposing the inclusion of specific plants. More importantly, NFE is able to contribute to food sovereignty by expanding opportunities for elders, gardeners, and gatherers to engage their knowledge and participate in the local food economy. In providing new opportunities and incentives, tribal agencies and their partners can invest in the ecological relations that comprise food systems: relations between gatherers and noncultivated plants, gardeners and soils, or elders and market vendors. As food moves within these relations, it connects people with each other and their landscape. Food sovereignty recommitments communities to social and ecological relations and acknowledges long-term interdependence in order to achieve self-determination. Nevertheless, the physical limitations of ecological relations across space are real, and careful planning for the spatial arrangement of food system components is critical to generate sustainable systems. 

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## References

- Adriaensen, F., Chardona, J. P., De Blust, G., Swinnend, E., Villalbad, S., Gulinckd, H., & Matthysena, E. (2003). The application of "least-cost" modeling as a functional landscape model. *Landscape and Urban Planning* 64(4), 233–247. [http://dx.doi.org/10.1016/S0169-2046\(02\)00242-6](http://dx.doi.org/10.1016/S0169-2046(02)00242-6)
- Anderson, M. D., & Cook, J. T. (1999). Community food security: Practice in need of theory? *Agriculture and Human Values*, 16(2), 141–150.
- Centers for Disease Control and Prevention (CDC). (2007). National Diabetes Surveillance System. *County Level Estimates of Diagnosed Diabetes*. Retrieved April 6, 2010, from <http://www.cdc.gov/diabetes/statistics/index.htm>
- Elwood, S. A. (2002). GIS in community planning: A multidimensional analysis of empowerment. *Environment and Planning A*(34), 905–922.
- Food and Agriculture Organization of the United Nations [FAO] Agriculture and Development Economics Division. (2006). *Food Security* (Policy Brief No. Issue 2). Rome: Food and Agriculture Organization of the United Nations.
- Hallett IV, L. F., & McDermott, D. (2010). Quantifying the extent and cost of food deserts in Lawrence, Kansas, USA. *Applied Geography* 31(4), 1210–1215. <http://dx.doi.org/10.1016/j.apgeog.2010.09.006>
- Jackson, M. Y. (1994). Diet, culture, and diabetes. In J. R. Joe & R. S. Young (Eds.), *Diabetes as a disease of civilization: The impact of culture change on indigenous peoples*, Studies in the Social Sciences. New York: de Gruyter Mouton.
- Johns, T., & Sthapit, B. R. (2004). Biocultural diversity in the sustainability of developing-country food systems. *Food and Nutrition Bulletin*, 25(2), 143–155.
- Kassam, K.-A. (2009). *Biocultural diversity and indigenous ways of knowing: Human ecology in the Arctic*. Calgary: University of Calgary Press.
- Kassam, K.-A., Soaring Eagle Friendship Centre. (2001). *So that our voices are heard: Forest use and changing gender roles of Dene women in Hay River, Northwest Territories*. Calgary: CIDA-Shastri Partnership Programme.
- Kassam, K.-A., The Wainwright Traditional Council. (2001). *Passing on the knowledge: Mapping human ecology in Wainwright, Alaska*. Calgary: Arctic Institute of North America.
- Kassam, K.-A., Karamkhudoeva, M., Ruelle, M., & Baumflek, M. (2010). Medicinal plant use and health sovereignty: Findings from the Tajik and Afghan Pamirs. *Human Ecology*, 38(6): 817–829. <http://dx.doi.org/10.1007/s10745-010-9356-9>
- Kraft, S. (1990). *Recent changes in the ethnobotany of Standing Rock Indian Reservation* (master's thesis). University of North Dakota, Grand Forks, North Dakota.
- Kuhnlein, H. V., Erasmus, B., & Spigelksi, D. (2009). *Indigenous peoples' food systems: The many dimensions of culture, diversity, and environment for nutrition and health*. Rome: Food and Agriculture Organization of the United Nations.
- Kuhnlein, H. V., & Receveur, O. (1996). Dietary change and traditional food systems of indigenous peoples. *Annual Review of Nutrition*, 16(1), 417–442. <http://dx.doi.org/10.1146/annurev.nu.16.070196.002221>
- LaDuke, W. (1999). *All our relations: Native struggles for land and life*. Cambridge, Massachusetts: South End Press.
- Lawson, M. L. (1994). *Dammed Indians: The Pick-Sloan Plan and the Missouri River Sioux, 1944–1980*. Norman, Oklahoma: University of Oklahoma Press.
- Menezes, F. (2001). Food sovereignty: A vital requirement for food security in the context of globalization. *Development*, 44(4), 29–33.



- Standing Rock Nutrition for the Elderly and Caregiver Support (NFE). (2007). *Needs assessment 2007*. Fort Yates, North Dakota: Standing Rock Tribal Health Department.
- Pevar, S. (2002). *The rights of Indians and tribes: The authoritative ACLU guide to Indian and tribal rights* (3rd ed.). Carbondale, Illinois: Southern Illinois University Press.
- Pfaller, L. L. (1992). *James McLaughlin: The man with an Indian heart*. Richardton, North Dakota: Assumption Abbey.
- Ruelle, M. L. (2011). *Plants and foodways of the Standing Rock Nation: Diversity, knowledge, and sovereignty* (master's thesis). Cornell University, Ithaca, New York.
- Ruelle, M. L., & Kassam, K.-A. S. (2011). Diversity of plant knowledge as an adaptive asset: A case study with Standing Rock elders. *Economic Botany*, 65(3), 295–307. <http://dx.doi.org/10.1007/s12231-011-9168-x>
- Shaw, D. J. (2007). *World food security: A history since 1945*. New York: Palgrave Macmillan.
- Smith, R. A. (1981). *Moon of popping trees* (first edition). Lincoln, Nebraska: Bison Books.
- Smits, D. D. (1994). The Frontier Army and the Destruction of the Buffalo: 1865–1883. *The Western Historical Quarterly*, 25(3), 313–338. <http://dx.doi.org/10.2307/971110>
- Standing Bear, L. (1975). *My people, the Sioux*. Lincoln, Nebraska: University of Nebraska Press.
- U.S. Census Bureau. (2009a). “Corson County, South Dakota,” American Community Survey Demographic and Housing Estimates: 2005–2009. *American Fact Finder*. Retrieved April 5, 2011, from <http://www.census.gov/acs>
- U.S. Census Bureau. (2009b). “Sioux County, North Dakota,” American Community Survey Demographic and Housing Estimates: 2005–2009. *American Fact Finder*. Retrieved April 5, 2011, from <http://www.census.gov/acs>
- Ullrich, J. (Ed.). (2008). *New Lakota Dictionary: Lakȟotiyapi-English, English-Lakȟotiyapi & incorporating the Dakota dialects of Yankton-Yanktonai & Santee-Sisseton*. Bloomington, Indiana: Lakota Language Consortium.
- United Nations (2008). *United Nations Declaration on the Rights of Indigenous Peoples*. Retrieved September 16, 2010, from [http://www.un.org/esa/socdev/unpfi/documents/DRIPS\\_en.pdf](http://www.un.org/esa/socdev/unpfi/documents/DRIPS_en.pdf)
- Via Campesina. (1996). Food sovereignty: A future without hunger. Presented at the World Food Summit, Rome. Retrieved from <http://www.voiceoftheturtle.org/library/1996%20Declaration%20of%20Food%20Sovereignty.pdf>
- Windfuhr, M., & Jonsén, J. (2005). *Food Sovereignty: Towards democracy in localized food systems*. Rugby, Warwickshire, UK: Intermediate Technology Development Group Ltd.



## Do fast food restaurants cluster around high schools? A geospatial analysis of proximity of fast food restaurants to high schools and the connection to childhood obesity rates

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### Abstract

Nationwide, approximately 30% of children consume fast food on a typical day, and caloric intake from fast food has increased fivefold over the past three decades. Our analysis adds to a growing body of public health and planning research through a geospatial analysis of fast food restaurants in Santa Clara County, California. We selected 41 high schools, representing 97% of enrollment in the county, and examined proximity to fast food restaurants within 400 meters (437 yards) and 800 meters (875 yards) of the schools. Our results indicate that fast food restaurants are clustered near high schools with higher obesity rates. In addition, observation of student behavior suggests that many students patronize these establishments after school and often make poor nutritional choices,

consuming from 30% to 75% of the daily recommended allowance of calories for teens in a single after-school snack. Since there appears to be a relationship, albeit complex, between the built environment and public health, there also is an opportunity to develop more effective planning policies and programs to encourage active behavior and healthy eating choices.

### Keywords

built environment, children, ethnicity, fast food restaurants, geospatial analysis, obesity, planning, public health

### Introduction

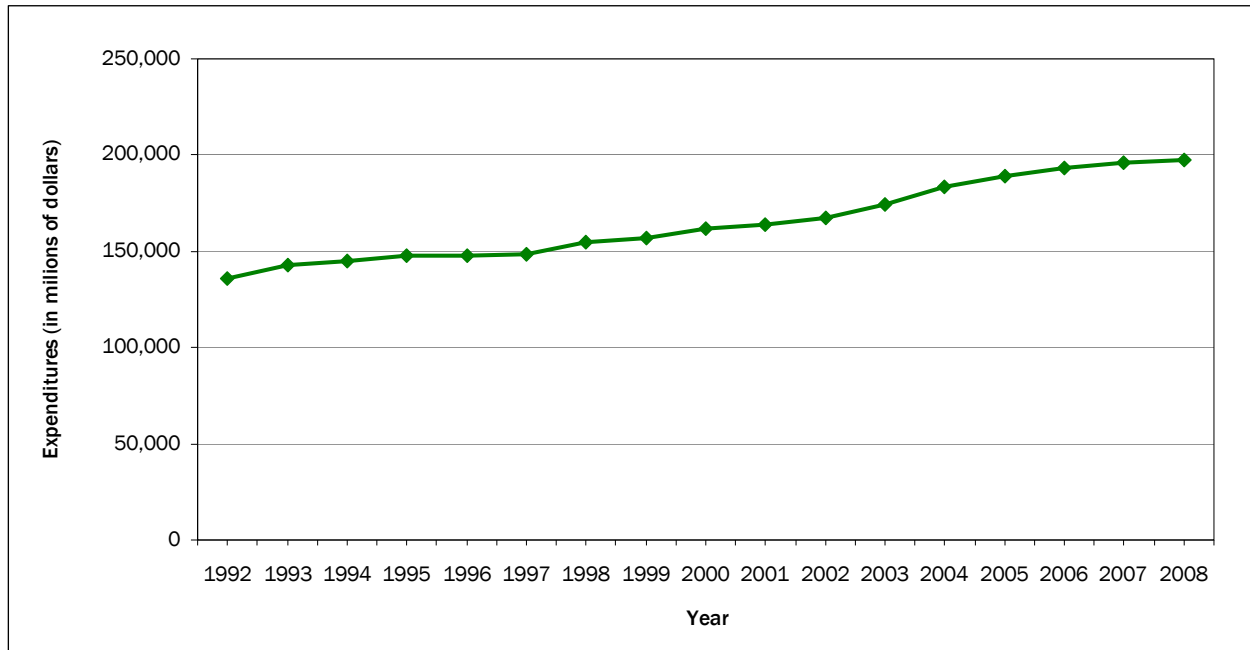
Americans spend nearly US\$200 billion annually on fast food (U.S. Census, 2010). Since 1992, sales at limited-service eating establishments including fast food restaurants have increased by 46% (in constant US 2010 dollars; see Figure 1) (U.S. Census, 2010). Two-thirds of adults and 16% of children are overweight or obese, and 30% of U.S. children consume fast food in a typical day (Hedley, Ogden, Johnson, Carroll, Curtin, & Flegal, 2004; Simon,

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**Figure 1. Annual Sales at Limited Service Eating Establishments, 1992–2008, in 2010 US Dollars**



Source: U.S. Census Bureau. (2010). Estimated annual sales of U.S. retail and food services firms by kind of business: 1992 through 2008. Retrieved from [http://www2.census.gov/retail/releases/historical/arts/2008\\_ARTS.pdf](http://www2.census.gov/retail/releases/historical/arts/2008_ARTS.pdf)

Kwan, Angelescu, Shih, & Fielding, 2008). Children’s daily caloric intake from fast food increased fivefold (from 2% to 10% of the daily recommended allowance of calories) between the late 1970s and the mid-1990s, while at the same time, school-age youth were becoming less physically active (Guthrie, Lin, & Frazao, 2002; McMillan, 2009). The human health impacts associated with unhealthy food consumption and lack of exercise are substantial. In fact, deaths attributed to poor diet and physical inactivity are second only to tobacco among preventable deaths in the U.S. (Mokdad, Marks, Stroup, & Gerberding, 2004, 2005). The economic impacts of obesity are also staggering. Finkelstein, Trogon, Cohen, and Dietz (2009) estimate that direct medical costs associated with obesity are US\$147 billion annually. If obesity patterns continue, estimates suggest that by 2018, annual obesity-related medical expenses will total US\$344 billion, approximately 21% of total annual health-care spending, compared to estimates of approximately 9% today (Hellmich, 2009).

Eating patterns developed in childhood tend to

persist into adulthood, and research finds that the food and beverage industry aggressively targets this demographic (Story & French, 2004). A growing body of literature focuses on the proximity of fast food establishments to schools.<sup>1</sup> Currie, DellaVigna, Moretti, and Pathania (2009) found a 5.2% increase in obesity rates among ninth graders when a fast food restaurant was located within one tenth of a mile (0.2 km) of their school. Similarly, Davis and Carpenter (2009) found that students with fast food restaurants within one-half mile (0.8 km) of their school were less likely to eat fresh fruits and vegetables, consume more soda, and were more likely to be overweight or obese.

Increasingly, geographic information systems (GIS) are employed as a methodological tool to assess

<sup>1</sup> Some excellent articles in this field include Austin et al., 2005, Currie, DellaVigna, Moretti, & Pathania, 2009; Davis & Carpenter, 2009; Nielson, Siega-Riz, & Popkin, 2002; Neumark-Sztainer, French, Hannan, Story, and Fulkerson, 2005; Simon et al., 2008; Sturm, 2008; and Zenk & Powell, 2008, among others.

proximity to fast food outlets and the relationship to obesity (see, for example, Day & Pearce, 2011; Howard, Fitzpatrick, & Fulfrost, 2011). The current research study complements the literature through a spatial analysis of formula-based fast food restaurants with a national footprint and high schools in Santa Clara County, California.<sup>2</sup> We focus particularly on the proximity of fast food restaurants to schools and the linkage to student health, including obesity, as assessed through student performance on California's Physical Fitness Test. In addition, we conduct limited ethnographic observational research to better understand some of the after-school eating behaviors at fast food restaurants located near schools. To date, the number of qualitative studies examining teenagers' eating behaviors is limited. Neumark-Sztainer, Story, Perry, and Casey (1999) conducted focus group discussions with teens to examine the factors that influence food choices. We are not familiar, however, with any study that has conducted ethnographic or unobtrusive observational research of teens' eating behaviors at fast food outlets. This approach provides additional insight into these behaviors beyond what can be captured using other methods (most notably, surveys).

Increasingly, studies have suggested various policy interventions, including zoning regulations, to limit the availability of fast food and promote access to healthy food alternatives that could reduce the obesity epidemic in the United States (Ashe, Feldstein, Graff, Kline, Pinkas, & Zellers, 2007; Ashe, Jernigan, Kline, & Galaz, 2003; Samia Mair, Pierce, & Teret, 2005). Obesogenic environments describe land use patterns that do not support physical activity and healthy eating opportunities, and, therefore contribute to obesity (Black & Macinko, 2008; Cummins, Petticrew, Higgins, Findlay, & Sparks, 2005; Maddock, 2004; White,

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<sup>2</sup> "Formula-based" indicates standardized features whose appearance is identical to other restaurants in the chain (e.g., menu, employee uniforms, architectural design, décor, or signage). "Fast food" refers to inexpensive food prepared and served quickly to consumers that tends to be high in fat and low in nutritional value. "National footprint" describes any restaurant with outlets in more than one state.

2007). One facet that defines obesogenic environments is access to unhealthy food, such as fast food restaurants (Simon et al., 2008). It should be noted that while healthy alternatives are available at fast food outlets (just as unhealthy choices are available at the finest dining establishments), the fast food industry generates the majority of its revenues from products that contain excessive amounts of fat, calories, and sugar (Stein, 2006).

Lifelong eating habits are often established during childhood. Therefore, in order to design and implement effective policy instruments, a more complete understanding of the food environment and eating behavior around secondary schools is key. Although this research focuses on a single county in California, the results are likely to be of much broader interest to public health professionals, school administrators, and planners in similar urbanized areas across the United States. Santa Clara County is ideally suited for this study because it shares many demographic characteristics with the overall California and U.S. population (see table 1). However, while Santa Clara County has many similarities, it is actually the differences that make this an ideal location to study issues related to childhood obesity. In particular, Santa Clara County is a majority non-White population. Several studies have shown a link between ethnicity, income, and obesity, and understanding how these dynamics play out in the local school food environment in Santa Clara County is likely to be of interest to a wide range of professionals and researchers.

The rest of this paper is structured as follows. In the next section, we describe our study area and present detailed information about our study schools. This is followed by a brief description of the process used to identify the fast food restaurants for our analysis. Then we present our geospatial analysis methods and discuss our results, followed by a presentation of our ethnographic observation research and results. Finally we conclude with a discussion of some policy approaches designed to promote healthy eating and active behavior.

**Table 1. Comparison of Selected Demographic and Socioeconomic Characteristics of Santa Clara County, California, and the U.S. Population, 2010**

Variable	Santa Clara County	California	U.S.
Persons under 5 years (%)	7.5	7.5	6.9
Persons under 18 year old (%)	24.4	25.5	24.3
Persons 65 year old and over (%)	10.9	11.2	12.9
High school graduates, age 25+ (%)	85.8	80.5	84.6
Median household income, 2009 (US\$)	84,990	58,925	50,221
Persons below poverty level (%)	9.1	14.2	14.3
White persons (%)	47.0	57.6	72.4
Black persons (%)	2.6	6.2	12.6
Asian persons (%)	32.0	13.0	4.8
Persons of Hispanic or Latino origin (%)	26.9	37.6	16.3

Source: U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, Census of Population and Housing, Small Area Income and Poverty Estimates.

### Study Area: Santa Clara County, California

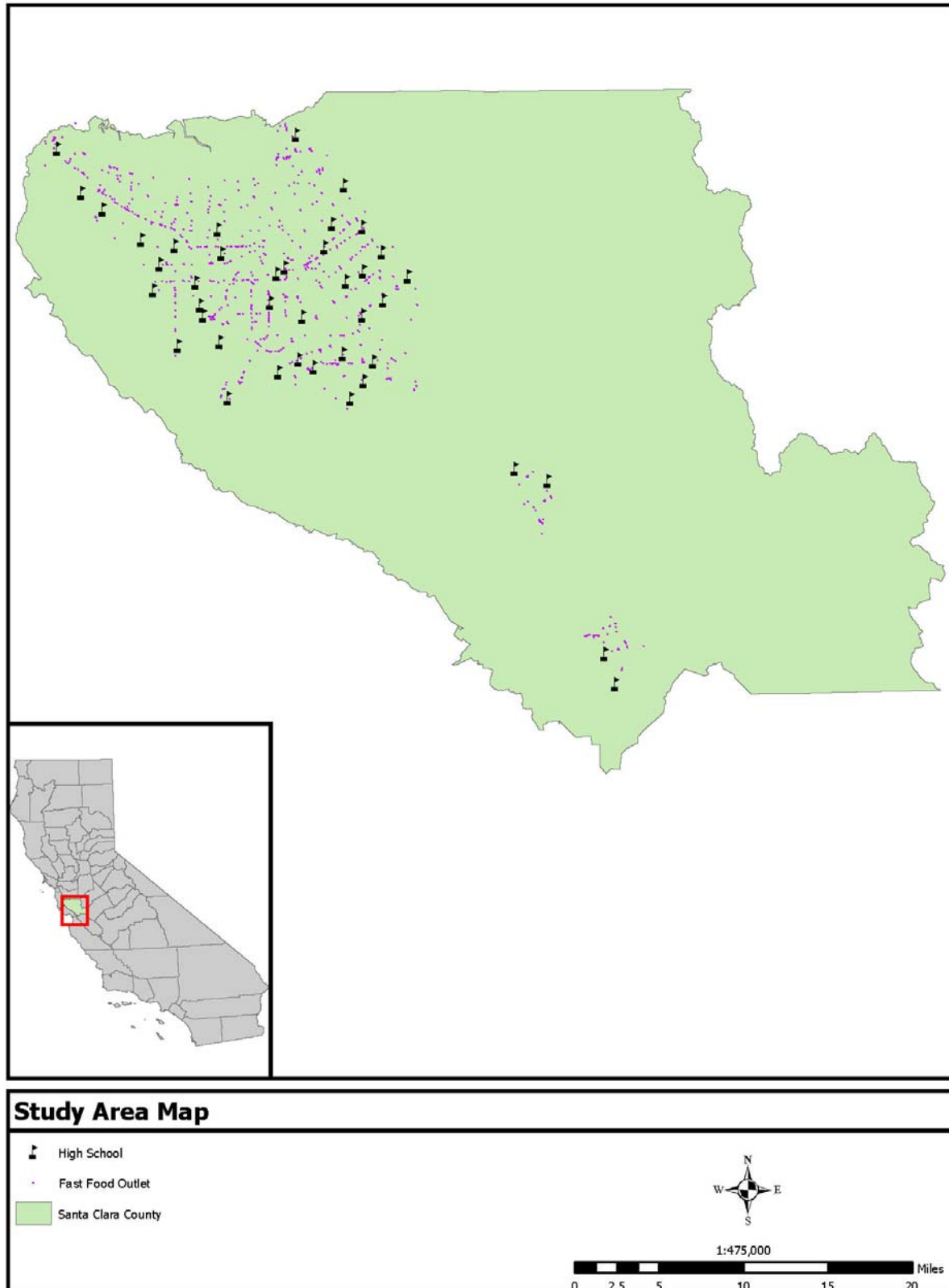
Santa Clara County is located in the heart of Silicon Valley in Northern California. Extending over an area of nearly 1,300 square miles (3,400 square km), the county is home to approximately 1.78 million people (U.S. Census, 2011). In 2008, there were approximately 60,000 students enrolled in 12 public high school districts throughout the county. Santa Clara County is of particular interest for this research as approximately 20% of children ages 5 to 19 are overweight, compared to 13% statewide and 15% nationally (Santa Clara County, 2005; U.S. Department of Health and Human Services, 2005).

For the purposes of this analysis, we focused on a subset of 41 public high schools in Santa Clara County, representing approximately 50% of all high schools and 97% of total enrollment (see figure 2). School data (see table 2) for Santa Clara County were obtained from the California Department of Education (CDE), including enrollment, student and parent demographic characteristics, National School Lunch Program (NSLP) participation rate, and whether the school maintained an open or closed campus policy for the 2007–2008 academic year (CDE, n.d.). Schools with open campus policies allow student to leave campus during lunch hours. To date, no research

appears to have examined open/closed campus policies status with food consumption patterns and resultant obesity rates.

In addition, we collected data on student performance on the California Physical Fitness Test. The California Physical Fitness Test is administered to all fifth, seventh, and ninth graders in the state and assesses the following six fitness measures: aerobic capacity, abdominal strength and endurance, upper body strength and endurance, body composition (i.e., body fat measurement and body mass index, or BMI), trunk extensor strength and flexibility, and flexibility (CDE, n.d.). The Cooper Institute developed “healthy fitness zones” (HFZ) for each of the six measures, and children are designated as either within or not within an HFZ. Those schools that did not meet the minimum fitness-testing threshold of having at least 10 students’ results reported were excluded from our study; this included all of the alternative education facilities in the county. All data are aggregated to the school level to protect individual privacy. These data were secured in order to allow us to examine the possible statistical correlation between key characteristics (e.g., student race and ethnicity, parents’ education level, etc.) and the percent of students not within the HFZ. In addition, these

**Figure 2. Map of Study Area's High Schools and Fast Food Restaurants**



**Table 2. Summary Statistics for Schools**

Variable	Average	Range	Standard Deviation	Pearson Corr. Coef. (w/Not Within HFZ <sup>a</sup> )
Not within the Healthy Fitness Zone (% of students)	25.6	8.4–47.3	9.6	n.a.
Open or closed school policy (0=open, 1=closed)	0.78	0–1	0.42	0.56**
National School Lunch Program (% of students)	27.3	0–64	19.9	0.73**
Total school enrollment	1,384	65–2,664	479	–
Student race/ethnicity (% of students)				
American Indian	<1	0–2	0.59	0.38*
Asian	23	1–75	18.7	–0.55**
Black	3.5	0–10	2.04	0.17
Filipino	4.7	0–22	5.16	0.17
Hispanic/Latino	35.9	2–96	24.4	0.80**
Pacific Islander	0.63	0–2	0.7	0.02
White	30.4	1–81	20.5	–0.50**
Gifted and Talented Education Program (% of students)	12.9	0–32	6.9	–0.22
Parent Education Level (% of students with parents with the specified education level)				
Not a high school graduate	15.7	1–56	14.6	0.72**
High school graduate	17.6	1–36	9.7	0.71**
Some college	20.3	3–36	8.6	0.42*
College graduate	24.4	6–40	8.9	–0.44**
Graduate school	22.0	1–68	21.1	–0.81**

Notes:

<sup>a</sup> HFZ refers to Healthy Fitness Zone

\* and \*\* represent statistical significance at the  $p < 0.05$  and  $p < 0.01$  levels.

Source: California Department of Education.

data were used to identify the targeted schools for our ethnographic research.

On average, one quarter of students participating in the California Physical Fitness Test fell outside the range for the Healthy Fitness Zone. Since body composition is only one component of the testing, this does not mean that all students not within an HFZ are overweight or obese, but there is a strong relationship between the two. We see quite a range across the schools in the percent of students not within an HFZ. At the upper end, at San Jose High Academy, 47% of students tested were not within an HFZ, while only 8% of students at Los Gatos High School fall into this range. Although we did not collect household income data for the schools,

it is interesting to note that San Jose High Academy is located in one of the lowest income communities in the county, while Los Gatos High School is in one of the highest income areas. Existing research on the relationship between income and obesity finds that lower-income neighborhoods experience much higher rates of obesity, often due to fewer opportunities for physical activity and reduced access to healthy food resources (Black & Macinko, 2008).

In order to better understand some of the educational and demographic factors that may have an influence on health, we computed the Pearson correlation coefficient between the percent of students not within an HFZ and a range of school-specific



and student and family demographic characteristics shown in table 2. This type of bivariate analysis cannot tease out the joint influence of multiple variables, but it does provide the opportunity to discover what some of the underlying significant relationships might be. We find statistically significant relationships between many of our variables and percent of students not within an HFZ.

Not surprisingly, we see a strong relationship between race and ethnicity and HFZ. There is a positive correlation between the percent of students with American Indian or Hispanic/Latino heritage and percent of students not within an HFZ. By contrast, a negative correlation exists for the percent of Asian or White students and HFZ. This confirms findings from other studies on obesity levels among different ethnic groups; higher rates of being overweight and obesity have been found for Latino, African American, and American Indian and Alaskan Native youth (Robert Wood Johnson Foundation, 2010).

We also find a significant relationship between parents' education levels and the percent of students not within an HFZ. Schools where a larger percentage of students were not within an HFZ were

also more likely to have a higher percentage of parents with lower levels of formal education. Alternatively, higher levels of parental education were negatively correlated with the percent of students not within an HFZ. There does not appear to be a large body of existing research specifically on this topic, although a 2005 study in Germany (Lamerz et al.) found that higher rates of childhood obesity were associated with lower parental education levels. In the U.S., a study by Variyam (2001) found that parents' nutrition knowledge is associated with obesity levels among children. Additionally, there is strong evidence to suggest that income and education are related (U.S. Bureau of Labor Statistics, 2011) and, as noted above, income and obesity are correlated.

### Identifying Fast Food Restaurants

In order to develop a comprehensive database of all formula-based fast food restaurants with a national footprint, data was obtained first from the Santa Clara County Department of Environmental Health (SCCDEH). All retail food facilities are routinely inspected by SCCDEH, and restaurant inspection records are available online through a third-party data provider (Decade Software Company). The SCCDEH data was cross-referenced with Yellowpages.com, as its online records only list those restaurants inspected within the past year. A total of 1,069 qualifying fast food restaurants were identified (see figure 2 for their physical locations) and they are summarized in table 3 based on the general category of food served.

### Geospatial Analysis and Results

All geographic analysis for this research was performed using ArcGIS 9.2 software. The process can generally be summarized into six distinct processes. First, public schools and fast food outlets were geocoded by address using Batchgeocode.com, a free online service that converts address data to latitude and longitude coordinates. Second, using the ArcGIS Network Analyst extension, a network dataset was created to generate 400-meter and 800-meter service areas around each school. Third, the density of fast food outlets within the 400-meter and 800-meter secondary-school food

**Table 3. Fast Food Restaurants in Santa Clara County, By Type**

Type	Count	Percent
Hamburger	240	22.5%
Sandwich	164	15.3%
Pizza	138	12.9%
Coffee	136	12.7%
Convenience	99	9.3%
Mexican	92	8.6%
Dessert	88	8.2%
Fried Chicken	44	4.1%
Chinese	23	2.2%
Hot Dog	23	2.2%
BBQ	15	1.4%
Bagel	7	0.7%
Total	1,069	100.0%

environments was calculated to quantify the degree of fast food outlet concentration. These distances have been used in several studies to approximate five-minute and 10-minute walks, respectively (Austin et al., 2005; Simon et al., 2008). Density was calculated as the number of outlets per acre within 400-meter and 800-meter service areas. Fourth, a Closest Facility analysis identified the closest fast food outlet to each school to assist with restaurant selection for observational research. Fifth, a second Closest Facility analysis was run to measure the streetline distance from each fast food outlet to the closest high school. This additional output variable, the distance from each fast food outlet to school, was used as an input variable to conduct spatial autocorrelation analysis. Lastly, the degree of clustering of fast food outlets near schools with higher obesity rates (defined as percent of students not within the HFZ) was assessed using ArcGIS's Spatial Autocorrelation (Moran's I) Tool. This tool measures whether a spatial pattern is clustered, dispersed, or random and calculates a Moran's I Index value. Values greater than zero indicate the presence of clustering. To simulate the urban environment, we selected a Manhattan grid, rather than a Euclidean distance, in ArcGIS to determine adjacency (i.e., whether the fast food outlet and high school are "neighbors" or not) for the spatial autocorrelation analysis.

## Results

The mean density of fast food outlets within the 400-meter and 800-meter service areas was 0.61 and 3.29 outlets per acre, respectively. Of the schools included in this analysis, nearly 60% had at least one fast food outlet within 800 meters of campus, which is comparable to existing research in California. Simon et al. (2008) found that 64.8% of schools in Los Angeles County had at least one fast food outlet within 800 meters, while Davis (2008) noted that 55% of all middle and high-school students in California were within 800 meters of at least one fast food outlet. Interestingly, our results, and existing California results, are noticeably higher than the nationwide average of 33% of schools with one fast food outlet within 800 meters (Zenk & Powell, 2008).

To further explore the relationship between obesity rates and density of fast food outlets in close proximity to high schools, we looked for spatial clustering and assessed this relationship using the Moran's I value. For both the 400-meter and 800-meter service areas, our results indicate that spatial clustering is present. Within the 400-meter service area, the Moran's I index value was 1.45, significant at the  $p < 0.01$  level of significance. The value for the 800-meter service area was 0.37, significant at the  $p < 0.05$  level of significance. These results indicate that there is a significant geospatial clustering relationship between obesity rates (as measured by percent of high school students not within the HFZ) and the proximity of fast food outlets. However, these results cannot determine why this geospatial pattern exists. Several studies have hypothesized that the level of commercialization in close proximity to schools, especially high schools, is a likely reason (Austin et al., 2005; Simon et al., 2008). What is particularly interesting about our finding is that we do not only examine whether there is an unusually large number of fast food outlets located near schools, which can logically be connected to levels of commercialization, but also we specifically connect this to students' fitness levels. In schools where a greater percent of students are not within an HFZ, there are more fast food outlets. A similar study, using a different methodological approach, by Davis and Carpenter (2009) finds similar results, lending confidence to our conclusion.

## Ethnographic Student Observation Analysis and Results

In addition to our geospatial analysis, we were interested in better understanding some of the eating habits of high school students. Several studies have surveyed students on their food choices (see, e.g. French, Story, Neumark-Sztainer, Fulkerson, & Hannan, 2001; Nielsen et al., 2002; Neumark-Sztainer et al., 2005; Neumark-Sztainer, 2009) but these methods rely on self-reporting, and the literature has consistently found errors of omission and commission when individuals self-report their behavior. Ethnographic observation can more accurately capture behavioral data than other qualitative behavioral studies. This is due to its

unobtrusive nature, as participants are unaware that their behavior is under observation (Bernard, 2002). However, this type of research is time-consuming and costly. Due to limited resources, we only were able to conduct observation at four schools; additional research is warranted to confirm our findings.

We selected our sites for observation based on the school obesity data and number of fast food restaurants within 800 meters. The two campuses with the most fast food outlets and highest obesity rates and the two with the fewest outlets and highest obesity rates were selected for this part of our study. A Closest Facility analysis, partnered with on-site ground-truthing, was used to select the fast food outlets for observation. Table 4 summarizes our study locations.

The ethnographic observation took place on weekdays immediately following the end of the school day for a period of approximately 30 minutes. The intent was to capture the “after-school snacking” behavior of high school students. The researcher was seated at a location in the fast food outlet that allowed him or her to record the items purchased by the students without notice. Students from the local high school were identified using the best judgment of the researcher and included a combination of factors including age, attire (e.g., logoed apparel, backpacks, etc.), and, when audible, conversations by the subjects. A chart was used to track and record all purchases. Nutrition information readily available from the establishment’s main corporate website was then used to calculate the total calorie and fat consumption.

## Results

Our results for after-school snacking behaviors at each of the four sites selected are summarized in table 5. Average total calories consumed ranged from 520 (at the coffee house) to 1,371 (at the pizza outlet), representing as much as 57% of the total daily recommended allowance for 14 to 18 year olds and as much as 75% of total daily recommended allowance for fat grams. In addition to our analysis of the food orders, we observed some additional noteworthy student eating behaviors. At the hamburger outlet, items from the value menu were extremely popular. In fact, of the seven subjects who were observed, six purchased items exclusively from the value menu. In addition, although not a focus for our study as we could not observe the specific orders, we noticed a large number of drive-through customers who appeared to be mothers picking up their children after school. Large, foot-long subs were popular at the sandwich shop. In addition, although the sandwich shop had clearly identified lower-calorie, healthier options, students tended to order higher calorie sandwiches with all of the trimmings (e.g., mayonnaise, cheese, etc.). Purchasing behavior at the coffee shop was even more striking. All seven subjects purchased large, blended drinks (5 coffee-based, 2 tea beverages) and all ordered their beverage with whipped cream. In addition, it appeared that the students were regular patrons, as the baristas knew the customers by name.

Although our results are from a small number of sites and therefore it is impossible to generalize or make broad conclusions, certain elements warrant discussion and may prompt more in-depth

**Table 4. Summary of Schools for Ethnographic Observation**

School	% Not Within HFZ	Number of Fast Food Outlets (800m)	Fast Food Outlet Type for Observation	Distance Between School and Fast Food Outlet
San José High Academy	47.3%	1	Pizza	540 ft. (165 m)
Overfelt High School	38.4%	1	Coffee house	1,606 ft. (490 m)
Prospect High School	27.4%	12	Hamburger	1,835 ft. (559 m)
Cupertino High School	15.3%	9	Sandwiches	1,531 ft. (467 m)

research. Our results suggest that high school students are patronizing these fast food establishments after school and they are often consuming large quantities of calories, typically in excess of one third of their total daily recommended allowance and more than one half of their daily recommended allowance for fat calories.

Our research methods do not allow us to determine what these students consume during other parts of the day, but our assumption is that these meals are considered after-school snacks, and that it is highly likely that the student consumed breakfast and/or lunch earlier in the day and is likely to consume dinner later in the evening. In the case of visits to nearby coffee houses, there is no doubt that the single beverage is not replacing a meal, yet it represents nearly 25% of the total recommended calorie and fat consumption the student should have during an entire day. In addition, while the hamburgers, sandwiches, and pizza did contain protein and vegetables, the coffee beverage has little nutritional value. Our research methods did not allow us to assess how regularly students consume coffee; however, evidence suggests that a growing number of children are drinking coffee,

particularly high-fat, blended coffee drinks (Swain, 2011).

We specifically selected the four school sites based on concentration of fast food outlets relative to obesity rates (high obesity rates and either high or low concentration of fast food outlets) to see if there was any difference in eating behaviors. Our limited study did not reveal any particular patterns. Further research using a wider range of sites and more in-depth study of eating behaviors is warranted.

### Conclusions and Policy Recommendations

While many argue that patronizing a fast food outlet is a personal choice, there are neighborhoods where the only choice is a fast food outlet, and/or where access to fresh, healthy food is extremely limited. A principle tenet of city planning is to protect the public's health; therefore, there is legal precedence to regulate the fast food industry and engage in community land use planning that supports physical activity and healthful eating. Only recently have municipalities begun to acknowledge that land use patterns affect a principle public health concern — obesity. The built environment

**Table 5. Summary of Ethnographic Observation of After-School Snacking Behavior**

School (# of subjects observed)	Fast Food Outlet Type	"Typical" Snack <sup>a</sup>	Average Calories Consumed & % of Daily Recommended Allowance <sup>b</sup>	Average Total Fat (in grams) of Snack & % of Daily Recommended Allowance <sup>c</sup>
San José High Academy (4)	Pizza	Pizza <sup>d</sup>	1,371 / 57.1%	54 / 75%
Overfelt High School (7)	Coffee house	Coffee beverage (large size, ice-blended)	520 / 21.7%	18 / 24.6%
Prospect High School (7)	Hamburger	Cheeseburger or chicken sandwich, small fries, medium soda	854 / 35.6%	33 / 45.3%
Cupertino High School (12)	Sandwich	Sandwich (large)	1,013 / 42.2%	49 / 68.2%

Notes:

<sup>a</sup> Each subject's order was recorded in detail. However, for purposes of this summary, we provide an example of the typical order.

<sup>b</sup> For each subject's order, the total caloric content was obtained from information published by the fast food outlet. The percent of daily recommended allowance was based on an average 2,400 calorie diet for 14 to 18 year olds as published by the U.S. Department of Health and Human Services.

<sup>c</sup> For each subject's order, the total fat content was obtained from information published by the fast food outlet. The total daily allowance for fat should not exceed a median value of 30% of total calories per day, or 72 grams of fat for children age 4–18.

<sup>d</sup> At this outlet, most food was purchased for consumption by more than one person. For each eight-slice pizza, an estimate of 2.67 slices per person was assumed. In one case, a large order slightly skewed the results summary, as it included multiple pizzas plus other consumables and was a take-out order, which made it difficult to assess how many people would be consuming the meal.

affects the public's ability to safely bicycle and walk throughout a community. Further, access to healthy and unhealthy food affects the nutritional choices available to a community.

The relationship between public health and planning is complex, but our research provides some initial evidence to suggest that Santa Clara County may be an obesogenic environment. Our geospatial analysis clearly shows that fast food outlets are clustered near high schools with higher obesity rates (as measured by percent of students not within an HFZ) in the secondary school food environment. As the schools' obesity rate increases, the number of nearby fast food outlets also increases. Furthermore, ethnographic observation confirms that students patronize these outlets and make poor nutritional choices. Previous research has suggested that the degree of commercialization in the secondary school food environment may be the cause of clustering near schools (Austin et al., 2005; Simon et al., 2008; Zenk and Powell, 2008). Degree of commercialization alone does not necessarily lead to fast food clustering, however. Simon and colleagues (2008) found that in comparably commercialized neighborhoods, income level dictated the concentration of fast food outlets. Lower income commercialized neighborhoods had higher concentrations of fast food outlets.

Academic and popular literature often postulates that fast food outlet chains intentionally target locations with close proximity to youth, even though no studies published to date have proven this theory. There is, however, a basis for this argument. Ray Kroc, founder of McDonald's, states in his book *Grinding It Out: The Making of McDonald's* that "back in the days when we first got a company airplane, we used to spot good locations for McDonald's stores by flying over a community and looking for schools and church steeples" (Kroc, 1992). Although only six of the 90 McDonald's in Santa Clara County are within 800 meters of a school, this ubiquitous chain has a franchise within 1.66 miles (2.67 km) of every high school in the county. According to Walton, Pearce, and Day (2009), children exposed to fast food outlets and to fast food advertising billboards along

their route to school are more likely to make unhealthy food choices at school. Thus, limiting access to fast food outlets and restricting advertising billboards within this larger school food environment may provide important health benefits to children.

Our ethnographic research also highlights some key opportunities for policy intervention. It is not just the presence of fast food outlets in close proximity to schools that is a concern, but also the choices that individuals make when patronizing these establishments. Menu labeling is one policy option that might prove effective. A 2010 study by Tandon, Wright, Zhou, Rogers, and Christakis finds that parents chose hypothetical meals for their children with 102 fewer calories on average when presented with caloric information on the menus. California passed a law in 2008 requiring all restaurants with more than 20 outlets to print calorie information on menus, and the new national health care law includes a menu-labeling provision. Studies on the impacts of menu labeling, however, are limited, and considerably more research is needed. Consumer education is an essential piece of the very complex puzzle of the relationship between the built environment, behaviors, and public health.

A variety of policy tools can be used to regulate a municipality's retail food environment. The California cities of Calistoga and Carmel-by-the-Sea have banned fast food outlets entirely, and the city of Los Angeles adopted a fast food moratorium for a specific neighborhood that had an excessive concentration of fast food outlets. However, this approach is politically challenging. Encouraging retail outlets with healthy food is more palatable, while condition, incentive-based, and/or performance zoning can be used to encourage the development of full-service grocery stores and/or farmers' markets. A city's general or comprehensive plan is also an effective tool to promote a healthier built environment. Several California cities, including Richmond, Benicia, and Watsonville, as well as Marin County, have incorporated health elements into their general plans. The city of San Francisco has some progressive policies related

to public health and planning that can be used as models for other communities. A team of researchers from the San Francisco Department of Public Health developed a metric to evaluate health needs in urban development, called the Healthy Development Measurement Tool. It addresses a wide range of issues, from transportation infrastructure to social cohesion, and it includes a means to assess the retail food environment and residents' access to healthy food resources. However, this approach is voluntary and primarily focuses on large-scale residential or mixed-use developments. Truly effective policies to reduce obesogenic environments and promote healthy eating behaviors among school-age children will require a multifaceted approach combining public education campaigns and enforceable policies.

Despite some limitations of our research due to a fairly small sample size of 41 high schools and limited resources to conduct ethnographic observations, we believe our findings are relevant and contribute to the existing body of literature on the relationship between the built environment and public health. Evidence strongly supports the conclusion that geospatial clustering of fast food outlets exists within the secondary school food environment in Santa Clara County. In addition, our ethnographic research highlights that high school students make some poor nutritional choices and consume a significant number of calories and fat grams in their after-school snacks. Future research could explore this latter point in more depth.

## References

- ArcGIS (version 9.2) [Computer software]. Redlands, California: ESRI.
- Ashe, M., Feldstein, L. M., Graff, S., Kline, R., Pinkas, D., & Zellers, L. (2007, Spring). Local venues for change: Legal strategies for healthy environments. *Journal of Law, Medicine & Ethics*, 35(1), 138–147. <http://dx.doi.org/10.1111/j.1748-720X.2007.00118.x>
- Ashe, M., Jernigan, D., Kline, R., & Galaz, R. (2003). Land use planning and the control of alcohol, tobacco, firearms, and fast food restaurants. *American Journal of Public Health*, 93(9), 1404–1408. <http://dx.doi.org/10.2105/AJPH.93.9.1404>
- Austin, S., Bryn, S. J., Melly, M. S., Brisa, N., Sanchez, A., Patel, B. A., Buka, S., & Gortmaker, S. L. (2005). Clustering of fast-food restaurants around schools: A novel application of spatial statistics to the study of food environments. *American Journal of Public Health*, 95(9), 1575–1581. <http://dx.doi.org/10.2105/AJPH.2004.056341>
- Bernard, H. R. (2002). *Research methods in anthropology: Qualitative and quantitative approaches* (3rd ed.). Walnut Creek, California: AltaMira Press.
- Black, J. L., & Macinko, J. (2008). Neighborhoods and obesity. *Nutrition Reviews*, 66(1), 2–20. <http://dx.doi.org/10.1111/j.1753-4887.2007.00001.x>
- California Department of Education (CDE). (n.d.). California Physical Fitness Test. Retrieved from <http://data1.cde.ca.gov/dataquest/page2.asp?level=School&subject=FitTest&submit1=Submit>
- Cummins, S., Petticrew, M., Higgins, C., Findlay, A., & Sparks, L. (2005). Large scale food retailing as an intervention for diet and health: Quasi-experimental evaluation of a natural experiment. *Journal of Epidemiology and Community Health*, 59(12), 1035–1040. <http://dx.doi.org/10.1136/jech.2004.029843>
- Currie, J., DellaVigna, S., Moretti, E., & Pathania, V. (2010). The effect of fast food restaurants on obesity. *American Economic Journal: Economic Policy*, 2(3), 32–63. <http://dx.doi.org/10.1257/pol.2.3.32>
- Davis, B., & Carpenter, C. (2009). Proximity of fast-food restaurants to schools and adolescent obesity. *American Journal of Public Health*, 99(3), 505–510. <http://dx.doi.org/10.2105/AJPH.2008.137638>
- Davis, L. B. (2008). *Geographic placement, social identification, and consumption: A study of fast-food placement around schools and youth obesity* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3296254).
- Day, P. L., & Pearce, J. (2011). Obesity-promoting food environments and the spatial clustering of food outlets around schools. *American Journal of Preventative Medicine*, 40(2), 113–121. <http://dx.doi.org/10.1016/j.amepre.2010.10.018>
- Finkelstein, E. A., Trogon, J. G., Cohen, J. W., & Dietz, W. (2009). Annual medical spending attributable to obesity: Payer- and service-specific estimates. *Health Affairs*, 28(5), 822–831. <http://dx.doi.org/10.1377/hlthaff.28.5.w822>
- French, S. A., Story, M., Neumark-Sztainer, D., Fulkerson, J. A., & Hannan, P. (2001). Fast food restaurant use among adolescents: Associations with nutrient intake, food choices and behavioral and psychosocial variables. *International Journal of Obesity*, 25(12), 1823–1833. <http://dx.doi.org/10.1038/sj.ijo.0801820>

- Guthrie, J. F., Lin, B.-H., & Frazao, E. (2002). Role of food prepared away from home in the American diet, 1977–78 versus 1994–96: Changes and consequences. *Journal of Nutrition Education and Behavior*, 34(3), 140–150. [http://dx.doi.org/10.1016/S1499-4046\(06\)60083-3](http://dx.doi.org/10.1016/S1499-4046(06)60083-3)
- Hedley, A. A., Ogden, C. L., Johnson, C. L., Carroll, M. D., Curtin, L. R., & Flegal, K. M. (2004). Prevalence of overweight and obesity among US children, adolescents, and adults, 1999–2002. *Journal of the American Medical Association*, 291(23), 2847–2850. <http://dx.doi.org/10.1001/jama.291.23.2847>
- Hellmich, N. (2009, November 17). Rising obesity will cost U.S. health care \$344 billion a year. *USA Today*. Retrieved from [http://www.usatoday.com/news/health/weightloss/2009-11-17-future-obesity-costs\\_N.htm](http://www.usatoday.com/news/health/weightloss/2009-11-17-future-obesity-costs_N.htm)
- Howard, P. H., Fitzpatrick, M., & Fulfrost, B. (2011). Proximity of food retailers to schools and rates of overweight ninth graders: An ecological study in California. *BMC Public Health*, 11, 68. <http://dx.doi.org/10.1186/1471-2458-11-68>
- Kroc, R. (1992). *Grinding It Out: The Making of McDonald's*. New York: St. Martin's Paperbacks.
- Lamerz, A., Kuepper-Nybelen, J., Wehle, C., Bruning, N., Trost-Brinkhues, G., Brenner, H., Hebebrand, J., & Herpertz-Dahlmann, B. (2005). Social class, parental education, and obesity prevalence in a study of six-year-old children in Germany. *International Journal of Obesity*, 29, 373–380. <http://dx.doi.org/10.1038/sj.ijo.0802914>
- Maddock, J. (2004). The relationship between obesity and the prevalence of fast food restaurants: State-level analysis. *American Journal of Health Promotion*, 19(2), 137–143.
- McMillan, T. E. (2009, May). *Walking and biking to school, physical activity and health outcomes*. Research Brief, Active Living Research, Robert Wood Johnson Foundation. Retrieved from [http://www.activelivingresearch.org/files/ALR\\_Brief\\_ActiveTransport.pdf](http://www.activelivingresearch.org/files/ALR_Brief_ActiveTransport.pdf)
- Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States, 2000. *Journal of the American Medical Association*, 291(10), 1238–1245. <http://dx.doi.org/10.1001/jama.291.10.1238>
- Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2005). Correction: Actual causes of death in the United States, 2000. *Journal of the American Medical Association*, 293(3), 293. <http://dx.doi.org/10.1001/jama.293.3.293>
- Nielsen, S. J., Siega-Riz, A. M., & Popkin, B. M. (2002). Trends in food locations and sources among adolescents and young adults. *Preventive Medicine*, 35(2), 107–113. <http://dx.doi.org/10.1006/pmed.2002.1037>
- Neumark-Sztainer, D. (2009). Preventing obesity and eating disorders in adolescents: What can health care providers do? *Journal of Adolescent Health*, 44(3), 206–213. <http://dx.doi.org/10.1016/j.jadohealth.2008.11.005>
- Neumark-Sztainer, D., French, S. A., Hannan, P. J., Story, M., & Fulkerson, J. A. (2005). School lunch and snacking patterns among high school students: Associations with school food environment and policies. *International Journal of Behavioral Nutrition and Physical Activity*, 2, 14. <http://dx.doi.org/10.1186/1479-5868-2-14>
- Neumark-Sztainer, D., Story, M., Perry, C., & Casey, M. A. (1999). Factors influencing food choices of adolescents: Findings from focus-group discussions with adolescents. *Journal of the American Dietetic Association*, 99(8), 929–937. [http://dx.doi.org/10.1016/S0002-8223\(99\)00222-9](http://dx.doi.org/10.1016/S0002-8223(99)00222-9)
- Robert Wood Johnson Foundation. (2010, May). *Overweight and obesity among Latino youths*. Retrieved from <http://www.rwjf.org/files/research/20100512lhlatino.pdf>
- Samia Mair, J., Pierce, M. W., & Teret, S. P. (2005, October). *The use of zoning to restrict fast food outlets: A potential strategy to combat obesity*. The Center for Law & The Public's Health. Retrieved from <http://www.publichealthlaw.net/Zoning%20Fast%20Food%20Outlets.pdf>
- Santa Clara County. (2005). *2005 Santa Clara County children's report: Key indicators of well-being*. Retrieved from [http://storage.ugal.com/3283/childrens-report\\_2005.pdf](http://storage.ugal.com/3283/childrens-report_2005.pdf)
- Simon, P. A., Kwan, D., Angelescu, A., Shih, M., & Fielding, J. E. (2008). Proximity of fast food restaurants to schools: Do neighborhood income and type of school matter? *Preventive Medicine*, 47(3), 284–288. <http://dx.doi.org/10.1016/j.ypmed.2008.02.021>

- Stein, K. (2006). Healthful fast foods not part of healthful revenue. *Journal of the American Dietetic Association*, 106(3), 344–345. <http://dx.doi.org/10.1016/j.jada.2006.01.023>
- Story, M., & French, S. (2004). Food advertising and marketing directed at children and adolescents in the US. *International Journal of Behavioral Nutrition and Physical Activity*, 1, 3. <http://dx.doi.org/10.1186/1479-5868-1-3>
- Sturm, R. (2008). Disparities in the food environment surrounding US middle and high schools. *Journal of the Royal Institute of Public Health*, 122(7), 681–690.
- Swain, B. (2011). *Coffee, caffeine & children*. Lance Armstrong Foundation. Retrieved from <http://www.livestrong.com/article/449828-coffee-caffeine-children/>
- Tandon, P. S., Wright, J., Zhou, C., Rogers, C. B., & Christakis, D. A. (2010). Nutrition menu labeling may lead to lower-calorie restaurant meal choices for children. *Pediatrics*, 125(2), 244–248. <http://dx.doi.org/10.1542/peds.2009-1117>
- U.S. Bureau of Labor Statistics. (2011). *Education pays...* Retrieved from [http://www.bls.gov/emp/ep\\_chart\\_001.htm](http://www.bls.gov/emp/ep_chart_001.htm)
- U.S. Census. (n.d.). *State and County Quick Facts*. Retrieved April 17, 2009, from <http://quickfacts.census.gov/qfd/states/06/06085.html>
- U.S. Census Bureau. (2011). *2010 Census*. Retrieved from [http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC\\_10\\_PL\\_GCTPL2.CY07&prodType=table](http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_PL_GCTPL2.CY07&prodType=table)
- U.S. Census Bureau. (2010). *Estimated annual sales of U.S. retail and food services firms by kind of business: 1992 through 2008*. Retrieved from [http://www2.census.gov/retail/releases/historicalarts/2008\\_ARTS.pdf](http://www2.census.gov/retail/releases/historicalarts/2008_ARTS.pdf)
- U.S. Department of Health and Human Services. (2005). *Overweight and physical activity among children: A portrait of states and the nation 2005*. (The National Survey of Children's Health). Retrieved from <http://mchb.hrsa.gov/overweight/printit.htm>
- Variyam, J. N. (2001). Overweight children: Is parental nutrition knowledge a factor? *Food Review*, 24(2), 18–22.
- Walton, M., Pearce, J., & Day, P. (2009). Examining the interaction between food outlets and outdoor food advertisements with primary school food environments. *Health and Place*, 15(3), 841–848. <http://dx.doi.org/10.1016/j.healthplace.2009.02.003>
- White, M. (2007, March). Food access and obesity [Supplement S1]. *Obesity Reviews*, 8, 99–107. <http://dx.doi.org/10.1111/j.1467-789X.2007.00327.x>
- Zenk, S. N., & Powell, L. M. (2008). US secondary schools and food outlets. *Health and Place*, 14(2), 336–346. <http://dx.doi.org/10.1016/j.healthplace.2007.08.003>



## An optimization approach to assessing the self-sustainability potential of food demand in the Midwestern United States

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### Abstract

Conventional agriculture faces significant challenges as world population grows, food demand increases, and mobility becomes increasingly constrained. Reducing the distance food needs to travel is an important goal of sustainability and resiliency, particularly in the context of a variety of transportation challenges. In this study, we developed a linear programming optimization method to assess the potential of regions to meet dietary requirements with more localized and diversified agricultural systems. Emphasis is on

minimizing the distance between population centers and available cropland, accounting for variations in yield among 40 of the most marketable food crops that can be grown in the Midwestern United States. We also derived two new metrics to guide strategic planning toward more localized systems: the “per capita cropland requirement” and the “regional self-sustainability index.”

Overall, we conclude that the eight-state study region would require an average of 0.49 acres (0.2 ha) per consumer with an average absolute deviation of 0.09 acres (.04 ha). The self-sustainability index is estimated at 9.3, which indicates that the region has 9.3 times the cropland needed to become self-sustaining. Targeted dietary recommendations could potentially be met within a population-weighted average distance of 13.6 miles (21.9 km).

### Keywords

foodshed, local food, optimization, resiliency, sustainability

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## Introduction

Commodity farming evolved out of the mass-production era, when the cost to overcome distance was small compared to the labor savings generated by highly capitalized, single-purpose equipment. The digital era, however, is shifting economic direction toward technologies that are smaller, more adaptable, and more decentralized in nature. Consider, for example, how wireless devices have evolved to replace phone booths over the last three decades. Farm-to-market systems are likely to follow a similar path, particularly in response to a backlog of transportation-related costs that have accrued over the same timeframe.

The most important of these cost issues are:

(1) Global demand for transportation fuels is accelerating at the same time that the parasitic losses required to extract petroleum (or condition alternatives) are increasing. (2) Many segments of the Eisenhower-era highway system are about to reach the end of their 50-year design life. The plans to rebuild or shift modes are seriously underfunded and backlogged. (3) Public knowledge that transportation contributes to climate change implies it is likely to become a target for remedial sanctions at some point in the future. For these reasons, food system stakeholders both large and small will need to become increasingly focused on minimizing the transportation dependency of food systems.

Attempts have been made to quantify local food consumption and local food production using various methods. Some researchers have determined demand based on current dietary consumption patterns, accessing food consumption data from the USDA Economic Research Service, while others have looked at it from a health standpoint and determined demand based on optimal nutrient consumption. Production, or supply, has generally been determined using USDA Census of Agriculture data, yet the units of analysis have ranged from U.S. dollars to calories to dietary exchanges, just to name a few.

Desjardins, MacRae, and Schumilas (2010) conducted a regional study in Canada assessing quantity needed (demand) and local production capacity

(supply) to meet Canadian dietary requirements. Timmons, Wang, and Lass (2008) developed a local food measure, termed “maximum local food,” using per capita food value produced and useable (in dollars) and production per capita (in dollars) to represent consumption. With each method came practical and applied limitations. In the Canadian study, it was noted that supply could meet demand in the region studied by the target year 2016; however, about 10% of the cropland would need to be reallocated. For example, some of the current corn and soybean cropland would need to be allocated to rye, oats, and white beans. Likewise, constraints to achieving maximum local food percentages such as seasonality and lack of processing facilities were recognized limitations.

The term “foodshed” will be used throughout this paper. Some credit Arthur Getz with the introduction of the term in 1991 to describe where food comes from and how it gets there, although others might look to the earlier writings of Walter Hedden (1929). However, the term has evolved and been used in multiple ways since that time. Kloppenburg, Hendrickson, and Stevenson (1996) presented a foodshed as a unit of analysis, while Peters, Bills, Wilkins, and Fick (2008) defined it as a geographic area from which food is acquired.

In our study, we introduce methods to quantify and optimize the positioning of foodsheds within an eight-state region of the Midwest, taking into account the availability of cropland and the aggregate needs of each competing town or county located within it. For this purpose, we introduce two new terms to compare the food system potential of each location: (1) the “per capita cropland requirement” indicates the total cropland needed to produce a comprehensive mix of food products for one person (including products derived from livestock feed), taking into account loss factors and geographic variability in yields, and (2) the “regional self-sustainability index” indicates the ratio of the cropland available to the cropland needed to supply the same diet to the entire population residing within a targeted area. A value greater than one implies that a region has potential to become self-sustaining; a value less than one

indicates otherwise. Linear optimization techniques are applied to minimize aggregate distance among competing populations within the region.

The remainder of this paper discusses the methods and rationales incorporated in this study. The next section provides the applied research methods, including background and description of the problem; the following section describes how the data were formulated; the subsequent section introduces the linear programming model; the succeeding section reports the results; and the final section summarizes the paper with concluding remarks and future research directions.

### Research Methods

Our methods are derived from a study by researchers from Cornell University that identified foodshed potential in New York State (Peters, Bills, Lembo, Wilkins, & Fick, 2009). The New York study introduced the concept of a Human Nutritional Equivalent (HNE), which the authors defined as “a basket of food that contains representatives from all food groups combined in the proper proportions to constitute a complete diet for one person for one year.” The HNE targets a representative diet, which is used to identify how much cropland is needed for each consumer. The New York diet was targeted by the authors to meet USDA Food Pyramid guidelines (Kantor, 1999), based on crops that could be grown in New York State. Yields were averaged over three mile (~5 km) grid increments using geographic information systems (GIS) and high-resolution soil and land use data. The location of existing cropland was precisely identified and applied to the model to minimize overall transportation distance within the state.

Like the New York model, our study also bases dietary targets on a representative product mix derived from USDA dietary guidelines (United States Department of Agriculture [USDA], 2008). However, instead of assigning a product mix, we distribute the recommendations for each major food group proportionately to the national average per capita rates of consumption reported by the USDA’s Economic Research Service (United States

Department of Agriculture Economic Research Service, 2010). For example, we base the recommended amount of “orange vegetables” on carrots (55%), sweet potatoes (23%) and pumpkin (22%), which is proportionate to national average rates of consumption among the orange vegetables that can be grown inside the study region. To simplify the model, we ignored food products with negligible consumption within each group, generally individual products that contributed less than 1% of the weight of a defined food group.

A second key difference between our study and the New York study is in how we estimate yields. While the New York study uses GIS to estimate yields from soil types, we estimate them using relative proximity to reported yields for each crop. Data reported in the Agricultural Census (USDA, 2009) and Yearbook Summaries for Vegetables and Fruits and Nuts (USDA, 2010a, 2010b) were used to identify yields for counties located throughout the continental United States. Those yields were then projected to the geographic coordinates of each county in the study area using a north-south, east-west averaging method.

A third difference between our model and the New York study is that instead of using GIS to specifically identify where cropland is located, we use a linear programming model to optimize placement relative to each population center. In essence, we estimate the net difference in demand and supply potential for each location in the study area, and then optimize the allocation of deficit locations to surplus locations, with the objective of minimizing the distance between geographic coordinates for each region in the study area.

While the New York study is based on a three-mile grid resolution, ours averages 27 miles (~44 km), which varies according to the land area of each county-level data record. However, our method is based on rates, not totals, for each region. Instead of estimating totals for a specific three-mile grid location, we apply county-level rates per square mile to the area covered by each county or population center. For example, the availability of cropland is based on the percentage of total land

area, instead of its actual location. Rates specific to each county are then linked to the central latitude and longitude of the county, plus or minus the square root of its land area. Any error is contained within the approximate location of each county. The average distance across the counties included in the study region is 27 miles.

Basing the analysis on rates substantially reduces the volume of data and processing needed, and opens the model for application to almost any region of the United States. Data on population (Census) and cropland (Census of Agriculture) can be easily accessed for almost any county in the United States; the method for translating yields from national level reference data to locations inside the study area is described below in the section entitled “Yield Estimates.”

#### *Formulation of Data*

Individual data records were consolidated for all cities and counties located in the eight-state region surrounding Iowa. These include Iowa, Illinois, Missouri, Kansas, Nebraska, South Dakota, Minnesota, and Wisconsin. This region consists of 38 million people, distributed over 549,000 square miles (1,422,000 square km) of land area. Approximately half the population lives in cities or towns that are 1,000 to 100,000 people in size, a fourth lives in larger cities, and another fourth lives in smaller towns or rural areas. While the population density for the region as a whole averages 70 persons per square mile (27 persons per square km), over three-fourths live among densities that average 3,700 persons per square mile (1,423 persons per square km). By comparison, cropland averages 300 acres per square mile (47 ha per square km) or 4.3 acres (1.7 ha) per capita. Overall, cropland accounts for 48% of total land area throughout the region. These values were calculated from data downloaded directly from the Census Bureau and Census of Agriculture.

#### *Data Summary*

In total, the study area was broken down into 6,853 data records, consisting of 738 counties and 6,115 cities or towns (i.e., incorporated

places). All data were downloaded from various websites and consolidated using Federal Information Processing Standard (FIPS) codes to align each component. All data records include population, land area, and the longitude and latitude coordinates for its geographic center. Additionally, each county-level record includes total acres of cropland, and several calculated fields that estimate yields for 40 key crops and translate them in relation to each MyPyramid dietary group. For example, the recommended numbers of servings for each dietary group (USDA, 2008) are translated into the pounds that each crop is expected to contribute to it, based on the relative proportions of actual per capita consumption (Food Availability Data System). The pounds of each contributing crop are translated into acres per capita, and summed for each dietary group. Dietary groups are listed in table 1.

Six additional worksheets translate MyPyramid recommendations from daily loss-adjusted rates to equivalent farm weight requirements for each crop. These calculations also translate meat, dairy, poultry, and aquaculture into annual demand for feed crops, using generalized conversions to primary weight, carcass weight, live weight, feed rates and ration mixes. Only beef and dairy products

**Table 1. Targeted Demand Rates Per Capita**

Dietary group	Recommended MyPyramid servings per day (population average)	Percent adjustment from per capita rates of consumption*
Meat and Beans	5.1	76%
Dairy	2.8	169%
Grains	5.8	76%
Fats and Oils	26.6	41%
Sweeteners	14.1	47%
Fruit	1.7	193%
Dark Green Vegetables	0.4	272%
Orange Vegetables	0.3	245%
Starchy Vegetables	0.5	76%
Other Vegetables	0.9	113%

\* Per capita rates of consumption are equivalent to per capita loss-adjusted food availability rates.

required forage crops; all other rations are based solely on corn and soybeans.

In general, all supply and demand values are translated into “consumer equivalent” rates. By this, we mean any metric that can be linked to an “average” consumer for one year. On the demand side, a consumer equivalent refers to one unit of population, regardless of age or gender. On the supply side, it might include MyPyramid recommendations for one or more dietary groups, actual rates of per capita consumption, the equivalent farm weight needed to supply an individual food product, the number of acres required, the total land area required, or several other measures.

The primary result generated for each data record is net production capacity expressed in consumer equivalents per year, after deducting for the needs

of the internal population. A positive value indicates the data region has surplus production capacity; a negative value indicates the region has deficit capacity, and must import food from other areas to meet the needs of its population. The net values for each record, combined with its geographic coordinates, provide the inputs to the linear optimization model.

Generally, most counties generate surplus production relative to the needs of their rural populations. However, because cities and towns have no reported cropland referenced to them, they are estimated to have “zero” production capacity relative to the needs of their populations, and always generate production deficits. In essence, the linear programming model allocates these deficits to the surpluses available in the nearest part of a county, accounting for the competing needs of the cities in the nearby region.

**Table 2. Representative Crops Used To Determine Production Capacity**

Fruits	Vegetables	Others
apples	broccoli	corn for grain
cantaloupes	bell peppers	soybeans
grapes	cabbage	forage
peaches	carrots	barley
pears	celery	oats
strawberries	chile peppers	rice
watermelons	cucumbers	wheat
	garlic	dry beans
	green peas	sugar beets
	head lettuce	almonds
	leaf and romaine lettuce	peanuts
	onions	pecans
	potatoes	walnuts
	pumpkins	
	snap beans	
	spinach	
	squash	
	sweet corn	
	sweet potatoes	
	tomatoes	

#### *Yield Estimates*

Because the availability of data is extremely limited for many crops, only products with substantive per capita rates of demand were designated to represent each food group. For example the “red meat” group includes beef, pork, lamb, and veal. However, because beef and pork account for 99% of consumption, lamb and veal were ignored, and the total recommended amount of “red meat” was based entirely on the crops targeted to produce beef and pork. Overall, 164 distinct food products, including processing variants (fresh, canned, frozen, etc.) of the same crop were narrowed to the capabilities of the 40 representative crops listed in table 2.

All available data for each crop were downloaded for each of 3,040 counties located throughout the United States (including Hawaii and Alaska). Reference data varied from a minimum of 12 data points for celery up to 3,012 for forage crops. County-level yield and acreage data for field crops are widely available, and were sourced directly from the 2007 Census of Agriculture. Reference yields for other crops, however, were estimated by projecting statewide averages to the counties inside the state that reported substantive acreage for that

crop. Statewide averages for fruits, vegetables, and tree nuts were sourced from USDA Annual Summaries (averaging reported rates for years 2007–2009); the major producing counties within each state were sourced from 2007 Census of Agriculture.

Counties with reported acreage data but no yield data were used to identify the maximum north-south and east-west growing ranges for each crop. If a county in the study area was located outside the growing range for a crop, the yield for that crop was automatically determined to be zero, and the other crops in the dietary group were used to identify production capacity for that food group for that county.

Yields for crops that were in range of a data record were estimated by averaging all reference points available within a specified north-south and east-west offset distance. This “estimating range” was determined by dividing the distances between the outer limits of each growing range by the square

root of the number of data points available for it. A relatively large availability of reference data resulted in a relatively narrow estimating range, and vice versa. If the data record was within the growing range, but reference data was not available in either direction, a default yield was used which was based on the smallest yield identified nationally for the crop. Default yields were only applied when a county was within growing range of the crop.

The yields projected to each data record in the study area were then translated to the cropland needed to produce enough of each food group to meet the targeted dietary needs for an average consumer for one year. Regional averages for each of these values are listed in table 3. The conversion factors used to convert livestock feed to per capita crop requirements are included in table 4.

#### *Net Production Capacity*

Among the eight-state study area, the total amount of land needed for all crops averaged 0.49 acres (0.2 ha) per consumer, with an average absolute

**Table 3. Estimated Yields by Crop Group**

Crop Group	Pounds needed per capita*		Average estimated yield		Per capita cropland requirement		Per capita cropland requirement
	Pounds	Kilograms	Pounds/Acre	(Kg/Ha)	Acres	Hectares	(% of total)
Forage	985	447	5,379	6,024	0.183	0.074	38%
Corn	539	244	7,439	8,332	0.072	0.029	15%
Soybeans	241	109	2,360	2,643	0.102	0.041	21%
Grains (except corn)	125	57	2,408	2,697	0.052	0.021	11%
Fruit	428	194	12,276	13,749	0.035	0.014	7.2%
Nuts	7	3	413	463	0.018	0.007	3.7%
Legumes	6	3	1,143	1,280	0.005	0.002	1.0%
Dark green vegetables	62	28	18,043	20,208	0.003	0.001	0.7%
Starchy vegetables	121	55	34,215	38,321	0.004	0.002	0.7%
Orange vegetables	54	24	33,809	37,866	0.002	0.001	0.3%
Sweeteners	30	14	48,567	54,395	0.001	0.000	0.1%
Other vegetables	230	104	27,426	30,717	0.008	0.003	1.7%
<b>Totals</b>	<b>2,828</b>	<b>1,283</b>	<b>N/A</b>	<b>N/A</b>	<b>0.49</b>	<b>0.198</b>	<b>100%</b>

\* Note: Loss-adjusted MyPyramid recommended daily serving amounts converted to pounds per year at farm weight. Corn and soybeans include livestock feed as well as amounts used in other products (flours, fats, and sugars).

**Table 4. Livestock Conversion Rates**

<i>Per Capita Feed Requirements (Pounds or Kilograms of Dry Matter)</i>														
	Total		Beef		Pork		Poultry		Eggs		Fish		Dairy	
	Pounds	Kg	Pounds	Kg	Pounds	Kg	Pounds	Kg	Pounds	Kg	Pounds	Kg	Pounds	Kg
Pounds of Demand (Primary Weight)	630	286	48	22	36	16	53	24	24	11	12	5	456	207
Liveweight / Carcass Weight	N/A	N/A	1.6	1	1.3	1	1.3	1	1.0	0	1.0	0	1.0	0
Dry Matter / Production	N/A	N/A	8.0	4	3.5	2	3.0	1	2.6	1	2.0	1	1.4	1
Total Per Capita Feed Requirements	1,728	784	621	282	170	77	213	97	63	29	24	11	638	289
<i>Representative Ration Mix (% Pounds or Kilograms of Total Per Capita Feed Requirement)</i>														
	Total		Beef		Pork		Poultry		Eggs		Fish		Dairy	
Forage	N/A		80%		0%		0%		0%		0%		77%	
Corn	N/A		15%		70%		66%		66%		66%		11%	
Soybeans	N/A		3%		23%		33%		33%		33%		8%	
Other (i.e., minerals)	N/A		2%		7%		1%		1%		1%		4%	
<i>Crops Needed for Livestock Feed (Pounds or Kilograms of Dry Matter)</i>														
	Total		Beef		Pork		Poultry		Eggs		Fish		Dairy	
	Pounds	Kg	Pounds	Kg	Pounds	Kg	Pounds	Kg	Pounds	Kg	Pounds	Kg	Pounds	Kg
Forage	985	447	495	225	0	0	0	0	0	0	0	0	490	222
Corn	479	217	93	42	119	54	140	64	41	19	16	7	70	32
Soybeans	207	94	19	9	39	18	70	32	21	10	8	4	51	23

deviation of 0.09 acres (0.04 ha). This means that on average, each consumer requires between 0.40 and 0.58 acres (0.16 and 0.23 ha) of local cropland, depending on which county they are located. We define this metric as the per capita cropland requirement, which is a value identified for each county in the study region.

The total amount of cropland available in each county divided by its per capita cropland requirement is used to estimate the maximum

production capacity of each county, expressed in consumer equivalent units. Among the eight-state study area, cropland averaged 48% of total land area, with an absolute deviation of 21%. This means that cropland generally accounts for between 27% and 69% of total land area, depending in which county it is located.

The rural population of each county is subtracted from maximum production capacity to identify the net capacity that each county can

supply to other locations. All supply capacity originates in counties; none originates in cities or towns. The net capacities are indexed to a range that extends from the central coordinates of the county, plus or minus half the square root of the county's total land area, and allocated to nearby locations using the linear programming model. Surplus capacity that is not allocated to a city or town is ignored.

### *Population Distribution*

On the demand side, a consumer equivalent is synonymous with the total population of each city or county. Although recommended serving amounts vary by age group, it was determined that this did not substantially influence location-specific demands within the study area (see table 5). This is primarily because the distribution of population is relatively consistent from place to place.

For example, even though the number of servings for the 19–30 age group is 126% of the recommended average for the population as a whole (weighted to national population distribution), as a percentage of population, the age group only deviates from one location to another by 1.0% (United States Census Bureau, 2009). As such, deviations in the average servings needed per capita caused by variations in the percentage of 19–30 year old con-

sumers in any particular county is likely to be less than 0.3% (i.e., 26% multiplied by an average deviation of 1% of the population). Note that when a location has a relatively higher percentage of one age group, it will have a relatively lower percentage of another, meaning that part of the absolute deviation in per capita average will be offset. Note also that even though population deviations are generally higher among the two oldest age groups, the net dietary amounts for these groups do not vary significantly from the per capita average.

Thus it was determined that the benefits of accounting for regional variations in the distribution among age groups were not worth the substantial amounts of data processing that would be needed to account for all variables among a large number of discrete and competing regions. In essence, it would turn a single per capita rate into several thousand variables, with relatively little effect on accuracy.

### **Optimization Model and Results**

In this study, we used a linear programming model to formulate the foodshed optimization problem. This model has been used in a previous, smaller-scale study and reported in the literature (Hu, Wang, Arendt, & Boeckenstedt, in press). We used

**Table 5. Expected Deviations in Foodshed Demand by Age Group**

Age group	Percent of population contributed by this age group*	Recommended servings as a ratio of the population average*	Maximum error in servings per percent deviation in population	Average absolute deviation in percent of population between locations	Total potential deviation in recommended servings per capita per location
2–3	3%	58%	42%	0.2%	0.1%
4–8	7%	75%	25%	0.5%	0.1%
9–13	6%	89%	11%	0.3%	0.0%
14–18	7%	106%	6%	0.2%	0.0%
19–30	17%	126%	26%	1.0%	0.3%
31–50	27%	106%	6%	1.1%	0.1%
51+	31%	100%	0%	1.9%	0.0%
Total Population	97%	100%	0%	0%	0.1%

\* Note: The 0–1 year old age group accounts for approximately 3% of population, but is not assigned a MyPyramid dietary recommendation. As such, it is not considered a substantial consumer of the food groups targeted by this study.



population, dietary, and geographical information to map potential foodsheds. The emphasis is on minimizing total geographic distance between supply and demand.

The model formulation can be expressed as:

$$\text{Min} \sum_{i=1}^S \sum_{j=1}^D C_{ij} x_{ij}$$

subject to:

$$\sum_{i=1}^S x_{ij} \geq d_j$$

$$\sum_{j=1}^D x_{ij} \leq s_i$$

$$x_{ij} \geq 0$$

The key components of this linear programming model are:

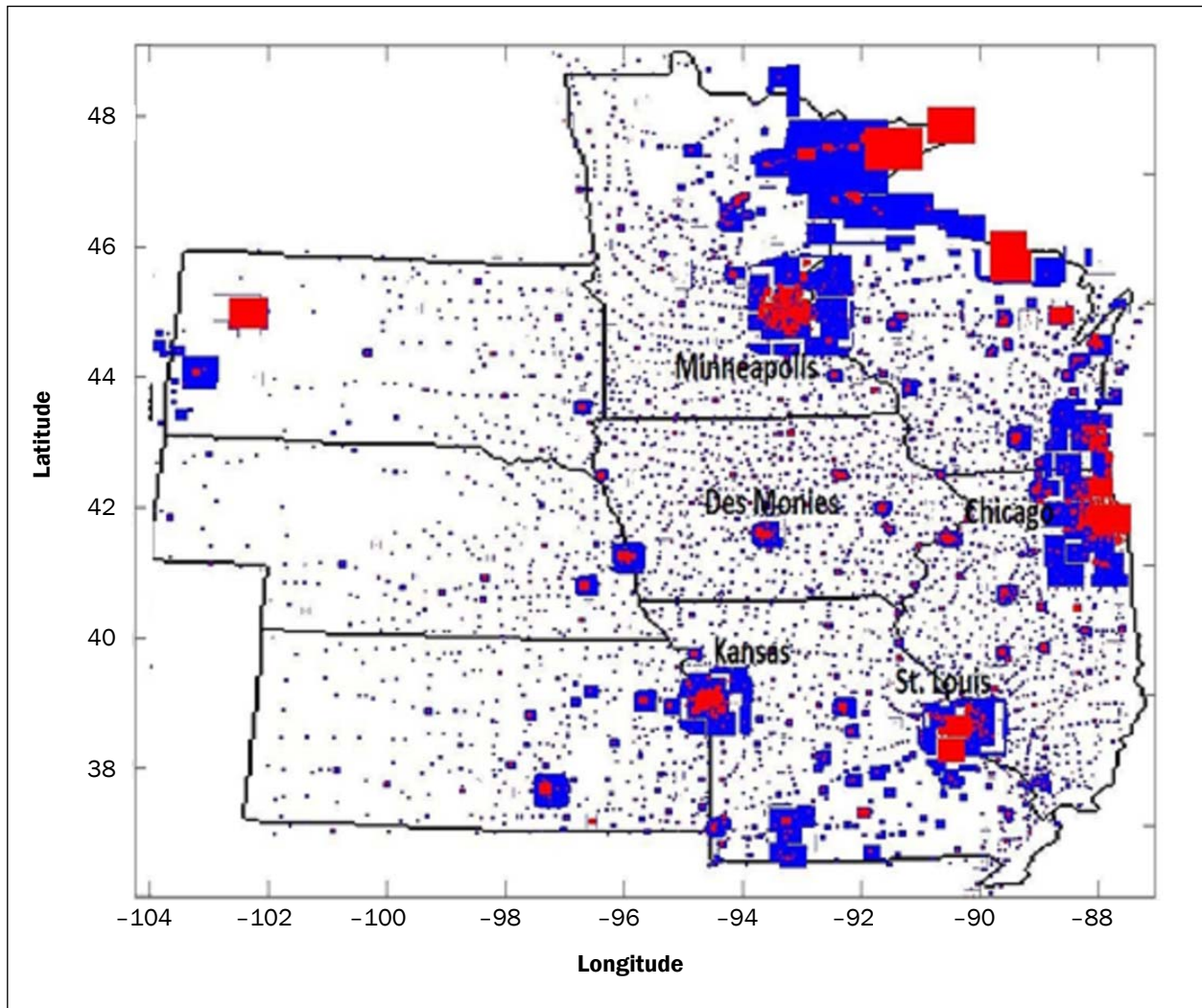
1. A set of decision variables:  
 $X = \{x_{ij}\}$ ,  $i = 1, 2, \dots, S$ ;  $j = 1, 2, \dots, D$ , representing the foodshed mapping relationship. The variable  $x_{ij}$  denotes the supply amount from supply block  $i$  to demand block  $j$ . We divide the studied region into one-square-mile blocks, with each block having either net supply, net demand, or neither. The values assigned to each block are effectively the net rates per square mile described in the “Research Methods” section above.
2. A parameter vector:  
 $C = \{c_{ij}\}$ ,  $i = 1, 2, \dots, S$ ;  $j = 1, 2, \dots, D$ . The parameter  $c_{ij}$  denotes the distance between supply block  $i$  to demand block  $j$ . Longitude and latitude coordinates are used to calculate the distance. We made the assumption that the transportation routes generally follow a north-south and east-west road grid and the total distance is the summation of distances between longitude and latitude.

3. A parameter vector:  $d = \{d_j\}$ ,  $j = 1, 2, \dots, D$ . The parameter  $d_j$  denotes the food demand for demand block  $j$  based on population size and per capita consumption requirements. The per capita consumption requirements are based on USDA MyPyramid daily servings. Demand was adjusted to MyPyramid rates as consumer equivalents, representing a total dietary amount for all food groups.
4. A parameter vector:  $s = \{s_i\}$ ,  $i = 1, 2, \dots, S$ . The parameter  $s_i$  denotes the supply capacity of supply block  $i$  based on land availability and expected yields of each crop.

Although linear programming problems can be efficiently solved by optimization solvers, we used a heuristic algorithm to obtain near-optimal solutions. This is because the studied region contains 26,175 demand blocks and 481,086 supply blocks, which makes the model too large to be solved by regular solvers. The heuristic algorithm is a greedy type that simply searches for available supply blocks in the neighborhood of demand blocks to match them. Heuristic algorithms are commonly used in solving optimization problems in which the exact solutions are computationally expensive to obtain. The area of the neighborhood is gradually increased until all demands are satisfied. Due to the simplicity of the heuristic method, we are able to obtain a solution within seconds on a standard personal computer.

The results of the linear optimization model for the eight-state region targeted for this study are shown in figure 1 (next page). The red areas represent locations with negative production capacity, which are generally urban centers or counties that do not have sufficient production capacity to support their populations. In essence these are locations that need to import food from other locations within the region. The blue areas represent locations with positive net capacity that has been allocated to other locations by the linear optimization model. Blue locations are located as close as possible to red locations and account for competing deficits from multiple locations.

**Figure 1. Foodshed Locations Identified Using Linear Optimization Modeling**



In general, each population center tries to satisfy its demand using the nearest surplus production capacity available. Whenever net capacity is insufficient, the region is expanded until demand from all population centers located within it are satisfied. Generally, the bigger the supply-demand area, the larger the area needed for its population to become self-sustaining.

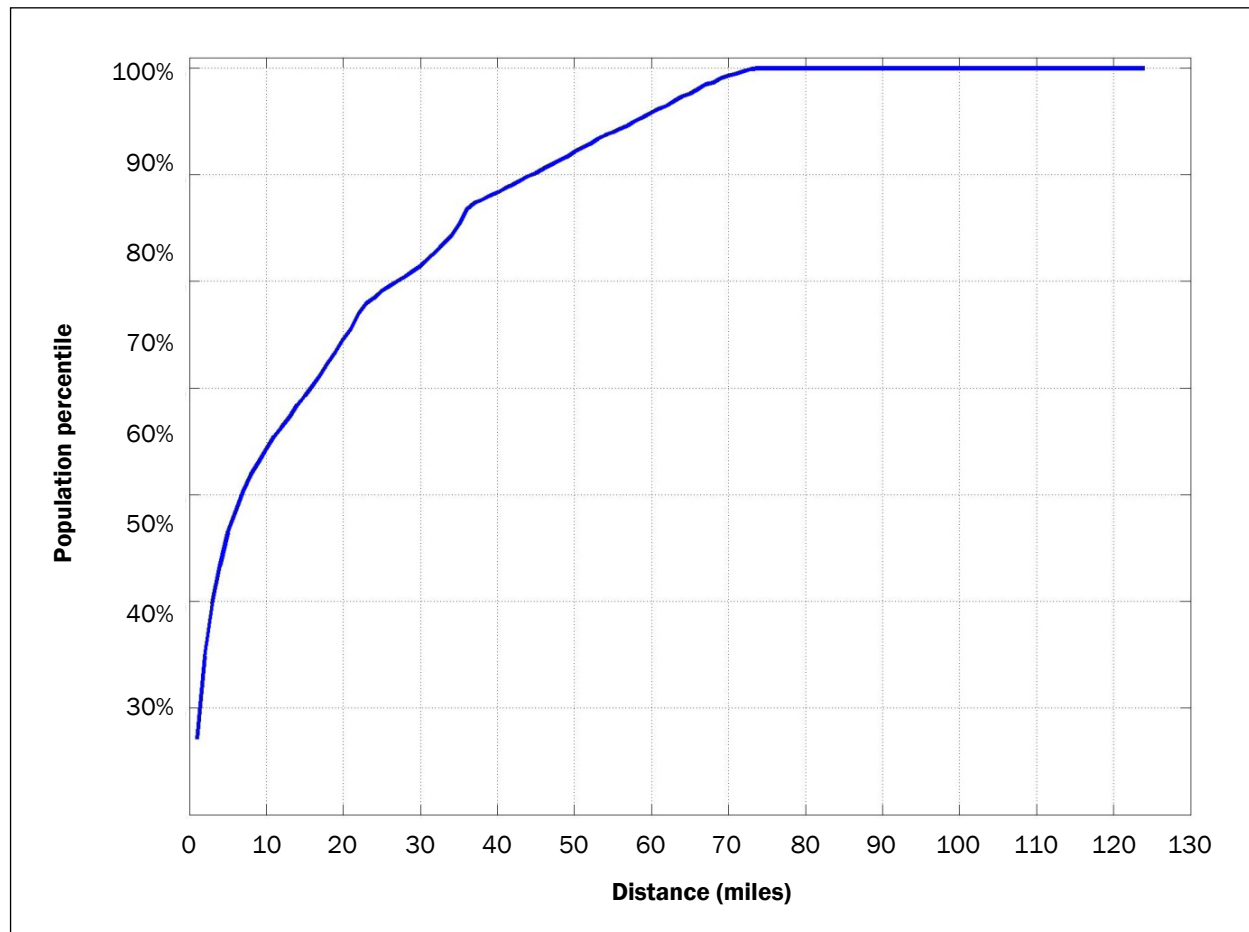
Note that larger distances areas are generally associated with larger population centers, but not entirely. Specifically, areas with lower cropland density or lower aggregate yields also require larger areas. For example, even though the population residing in the blue area surrounding Chicago is 25

times larger than the blue area that covers north-east Minnesota and Wisconsin, the self-sustainability region surrounding Chicago is smaller, because it is situated closer to more productive and densely available cropland. Figure 2 (next page) summarizes the minimum distances needed for serving a percentage of populations in the studied region. The graph starts at (distance = 1, population percentile = 35%), which means that about 35% of locations require less than the 1 mile based on the model results.

### Conclusions

In this study, we identified two new foodshed performance metrics and demonstrated that linear

**Figure 2. Distribution of Foodshed Distances Within the Study Region**



programming is effective and appropriate for organizing foodsheds to minimize transport requirements between population centers. While data from eight Midwestern states were used to demonstrate the model, the methods developed can also be applied to almost any other region of the country; all data is available online.

The per capita cropland requirement and regional self-sustainability index were both introduced to provide quick, easy-to-understand references for the comparison between regions. The per capita cropland requirement identifies how much acreage is needed within a region to meet all targeted dietary requirements for an average person for one year. This metric accounts for all expected production and spoilage losses, and can be multiplied

directly by population to identify the total cropland needed to supply a target area.


The regional self-sustainability index more broadly characterizes how effectively an area can become self-sustaining relative to the dietary target. This value is calculated by dividing the cropland available within a region by the total cropland needed to supply its internal population. A value greater than one implies the region can become self-sustaining; a value less than one implies otherwise.

When targeting a dietary mix that emulates all MyPyramid recommendations, the per capita cropland requirement for the eight-state region averages 0.49 acres (0.2 ha) per consumer, which on average varies by 0.09 acres (0.04 ha) per consumer within the region. The self-sustainability index is estimated

at 9.3, which indicates that the region has 9.3 times more cropland than it needs to become self-sustaining relative to the MyPyramid dietary target. The total cropland requirement for the region is estimated at 18 million acres (7.3 million ha).

Findings from the linear programming model are summarized as follows:

- Targeted MyPyramid recommendations can be met within an average distance (weighted by population) of 13.6 miles (21.9 km) throughout the study region.
- Fifty-six percent of the population could be supplied in less than a five-mile (8 km) production range.
- The Chicago area, which represents the largest concentration of consumers in the study area, could become self-sustaining within a 76 mile (122 km) range.
- Minneapolis (37 miles or 60 km), St. Louis (27 miles or 43 km), Kansas City (24 miles or 39 km), and Des Moines (10 miles or 16 km) could also become self-sustaining within relatively small travel distances.
- The predominantly rural, wooded areas of northern Minnesota and Wisconsin require a relatively larger range relative to population.

Of course, these results do not account for seasonality, storage methods, or quality perceptions, which are beyond the scope of this study. Our premise is that over time, a rise in transportation costs will drive investment toward more advanced food production and storage technologies to resolve these issues. As such, our future research will focus on methods to integrate risk and sensitivity analyses with respect to yield and demand fluctuations. 

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### References

- Desjardins, E., MacRae, R., & Schumilas, T. (2010). Linking future population requirements for health with local production in Waterloo Region, Canada. *Agriculture and Human Values*, 27, 129–140. <http://dx.doi.org/10.1007/s10460-009-9204-y>
- Hu, G., Wang, L., Arendt, S., & Boeckenstedt, R. (In press). Analyze sustainable, localized food production system with a systematic optimization model. *Journal of Hunger and Environmental Nutrition*.
- Hedden, W. (1929). *How great cities are fed*. Boston, Massachusetts: Health and Co.
- Kantor, L. S. (1999). A comparison of the US food supply with the Food Guide Pyramid Recommendations. In E. Frazao (Ed.). *America's Eating Habits: Changes and Consequences* (pp. 71–96). Washington, D.C.: U.S. Government Printing Office. Retrieved from <http://www.ers.usda.gov/Publications/AIB750/>
- Kloppenburg, J., Hendrickson, J., & Stevenson, G. W. (1996). Coming in to the foodshed. *Agriculture and Human Values*, 13(3), 33–42. <http://dx.doi.org/10.1007/BF01538225>
- Peters, C. J., Bills, N. L., Lembo, A. J., Wilkins, J. L., & Fick, G. W. (2009). Mapping potential foodshed in New York State: A spatial model for evaluating the capacity to localize food production. *Renewable Agriculture and Food Systems*, 24(1), 72–84. <http://dx.doi.org/10.1017/S1742170508002433>
- Peters, C. J., Bills, N. L., Wilkins, J. L., & Fick, G. W. (2008). Foodshed analysis and its relevance to sustainability. *Renewable Agriculture and Food Systems*, 24(1), 1–7. <http://dx.doi.org/10.1017/S1742170508002433>
- Timmons, D., Wang, Q., & Lass, D. (2008). Local foods: Estimating capacity. *Journal of Extension*, 46(5), 1–11.
- United States Census Bureau. (2009). *Population Estimate* [Data File]. Retrieved from <http://www.census.gov/popest/counties/asrh/CC-EST2008-agesex.html>

United States Department of Agriculture (USDA). (2010a). *Non-Citrus Fruits and Nuts Annual Summary, 2010* (Publication No. Fr Nt 1-3 (10)). Retrieved from <http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1113>

United States Department of Agriculture. (2010b). *Vegetables Annual Summary, 2010* (Publication No. Vg1-2 (10)). Retrieved from <http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1183>

United States Department of Agriculture. (2009). *2007 Census of Agriculture* (Publication No. AC-07-A-51).

Retrieved from [http://www.agcensus.usda.gov/Publications/2007/Full\\_Report/index.asp](http://www.agcensus.usda.gov/Publications/2007/Full_Report/index.asp)

United States Department of Agriculture. (2008). *How much is needed?* (OMB No. 0584-0535). Retrieved from <http://www.mypyramid.gov/pyramid/index.html>

United States Department of Agriculture Economic Research Service. (2010). *Food availability (per capita) data system*. Retrieved from <http://www.ers.usda.gov/Data/FoodConsumption/>



## Toward a more expansive understanding of food hubs

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### Abstract

A review of the uses of the term “food hub” reveals a dynamic and evolving concept. Since planners need to understand these various uses, we offer a preliminary framework for a food hub

typology. We also suggest attributes and a definition that should be considered when assessing existing sites and planning for new food hubs. We then assess three food hub sites in Seattle, Washington, using our typology and characteristics that should be considered (audience, ownership, purpose, design and siting, and scale). Our assessment demonstrates that the strengths, viability, and vitality of each food hub are derived from attributes not currently considered by the most commonly used, type-focused definitions of food hubs. Our contribution adds clarity to the evolving discussion about food hubs, and describes elements for communities, particularly the planning community, to consider when planning for them.

### Keywords

agglomeration, agricultural urbanism, distribution, food hub, food system, food value chain, market, planning

### The Rise of the Food Hub Concept

Many initiatives such as community supported agriculture and farmers’ markets exist as alterna-

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tives to the conventional, industrialized, global food system (Kloppenber, Lezberg, Master, & Stevenson, 2000). These initiatives expand infrastructure and market opportunities for “agriculture of the middle” and promote a more sustainable food system and food value chains (Connel, Smithers, & Joseph, 2008). One concept rapidly gaining recognition and attention across a diverse group of stakeholders — from nonprofit organizations and urban designers to universities and the United States Department of Agriculture — is the food hub. In a preliminary survey, the United States Department of Agriculture (USDA) has identified over 100 operational food hubs around the country, with average annual sales of nearly US\$1 million and an average of 13 jobs created per food hub, indicating the growing presence and impact of food hubs across the nation (USDA AMS, 2011). With the food hub concept growing in application, it is becoming important to establish a practicable definition. By reviewing existing approaches to defining food hubs and building typologies, we add clarity to the evolving discussion about food hubs. We also describe elements for communities, particularly the urban planning community, to consider when planning for food hubs.

Food hubs appear to offer numerous benefits, including expanded market opportunities for farmers, job creation, and increased access to healthy foods by consumers (National Good Food Network, 2011). They have the potential to improve the economic viability of small to medium-scale farms by creating networking opportunities, year-round markets, and aggregated processing and wholesale facilities that help increase economies of scale. A food hub focused on aggregation and distribution allows multiple producers to combine their products and ship them to wholesale purchasers in greater volume than most individual producers could manage on their own. A retail-oriented food hub that brings together multiple producers becomes a denser retail site or potentially a year-round farmers’ market. In cities, food hubs increase the presence of locally produced food, which serves to educate consumers about their food sources, local farmers,

and food processors. Food hubs increase access to healthy food for particular groups of residents. They also serve as nodes for social interaction. By having a more clear understanding of the full range of food hubs’ possible functions, urban planners and other stakeholders are better equipped to evaluate and support existing food hubs, as well as to plan for the development of new ones.

### **Would You Know a Food Hub If You Saw One? Definitions and Concepts**

The term “food hub” is used in multiple ways across diverse communities. This variation reveals a dynamic and evolving concept whose substantive characteristics are prioritized differently according to circumstances and the practitioners’ disciplines. As a new term, its meaning is not widely known or shared. For example, in Everett, Washington, an urban planner and local farmers’ cooperative have been working to establish a permanent agglomeration facility with processing infrastructure and direct sales outlets. Until asked, though, one of the project’s main coordinators had never identified the project as a “food hub” (L. Neunzig, personal communication, February 2011). Although the project was never identified as a food hub during the planning stages, it may have benefitted from the resources and experiences of professionals and grassroots organizers familiar with the concept.

Morley, Morgan, and Morgan (2008) anticipated the wide array of definitions currently used. They highlight the importance of establishing a clear notion of what food hubs represent and how they can be developed. The authors note that food hubs can contribute narrowly to increasing market efficiency, or can offer a broader vision that encompasses a healthy food system and diversified food culture. Short of offering a definition, the authors state, “on the simplest level the Food Hub can represent any kind of organizational model where food sourcing and supply is coordinated, and may be contrasted with a wholly dispersed market system (becoming more credible through internet shopping) comprising of [sic] direct links between the producer and the consumer” (p. 3).



As noted by Morley et al., there is a range of conceptions about food hubs. In North America, definitions of food hubs come from one of three frameworks: the USDA, the nonprofit organization Wholesome Wave, and landscape designers and authors Janine de la Salle and Mark Holland in their book *Agricultural Urbanism: Handbook for Building Sustainable Food Systems in 21<sup>st</sup> Century Cities*. The USDA, Wholesome Wave, and de la Salle and Holland embrace different conceptions of the food hub, with different foci and functions, leading to a term imbued with inherent complexity. Adapting the deconstructive approach used to describe the complexity of neighborhoods by Kallus and Law-Yone (2000), we describe these three approaches as instrumental (producer-oriented), humanistic (people-oriented), and phenomenological (community-oriented). In addition, we identify the key components of each food hub definition as well as its strengths and weaknesses.

The approach used by the USDA to define food hubs (unofficially) follows an instrumental and economic development perspective. It is largely producer-centric. According to their working definition, a food hub is “a centrally located facility with a business management system that facilitates the aggregation, storage, processing, distribution and/or marketing of locally or regionally produced food products” (2011). This definition is widely accepted and used with close variations by organizations such as the National Good Food Network (2011) and research institutions like the Occidental College Urban and Environmental Policy Institute (n.d.). The Regional Food Hub Advisory Council (2010) concluded that food aggregation and wholesale distribution are the two most critical elements of food hubs. The council also noted that “because of the great diversity among emerging Regional Food Hub (RFH) projects and the desire to include all of these efforts in a strategy for food systems reform, the description is less prescriptive than many” (p. 3). The Regional Food Hub Advisory Council’s exact definition of a food hub is “an integrated food distribution system that coordinates agricultural production and the aggregation, storage, processing, distribution, and marketing of locally or

regionally produced food products” (2010, p. 3). The USDA identifies the core components of a food hub as aggregation and distribution opportunities for wholesale products (including drop-off and pick-up points), the active coordination of activities along the food supply chain, and the provision of permanent facilities such as space and equipment for processing, packaging, storing, freezing, and other food-related activities. Other key attributes of the USDA’s concept of a regional food hub include an emphasis on aggregating products from local small and midsized producers and providing these source-identified locally grown products to wholesale buyers. They also include producer-oriented services such as post-harvest handling, packaging, branding, and labeling. Other potential features include wholesale and retail opportunities, health and social services, community kitchens, community meeting spaces, and educational programming. The USDA does not consider this definition to be official and the agency is working with partners to refine the definition (USDA, 2011).

A second approach to food hubs takes a more humanistic perspective, and is more community and health-centric rather than producer-focused. The Connecticut nonprofit organization Wholesome Wave discusses food hubs under the heading “Healthy Food Commerce Initiative,” indicating an emphasis on health (n.d.). While their definition of a food hub is based on the USDA’s definition (Wholesome Wave, n.d.), they also provide an image of a food hub that shows the intersection among a value-added food processing facility, storage and distribution system, and community-owned food market (Wholesome Wave, 2010). The emphasis on the community-owned food market, akin to a combination of a grocery store, food coop and farmers’ market, highlights the role of the broader community and defines specific elements of food retail to be included in a food hub. This vision of a food hub expands the possibilities for ownership by consumers, rather than producers. Wholesome Wave also notes other important elements of a food hub, including a community shared kitchen, administration (including a management office and

education classroom) and general support (utility, vertical circulation, and parking). The prime function of a food hub is to “provide easy access, opportunity, and viability for small producers and low-income consumers” and the main purpose is to “contribute to a healthier, more vibrant, and equitable system” (Wholesome Wave, n.d.).

A third approach to food hubs — the perspective set forth in *Agricultural Urbanism* (2010) by Janine de la Salle and Mark Holland of the Canadian design firm HB Lanarc — stems from a phenomenological and community-centric approach that highlights the experience of people within the food hub’s physical environment. Here, the intent is to assist urban designers in considering and developing food hubs and the experiences they offer. De la Salle and Holland define a food hub as a “place

that brings together a wide spectrum of land uses, design strategies, and programs focused on food in order to increase access, visibility, and the experience of sustainable urban and regional food systems within a city” (p. 150). They situate their definition within a greater vision of what they call agricultural urbanism: “a planning, policy, and design framework for developing a wide range of sustainable food and agricultural elements into multiple community scales. A[gricultural] U[rbanism] focuses on integrating the widest possible range of food system elements into a community in a manner appropriate to the community” (p. 9). More than the preceding food hub definitions, this definition highlights urban design elements and focuses on the sensory experience of the food hub visitor. It also includes aspects of the instrumental and humanistic

**Table 1. Summary of Three Common Food Hub Definitions**

Source	Definition	Major Components and Elements	Function	Purpose
<b>United States Department of Agriculture</b> (working definition; not official)	A centrally located facility with a business management system that facilitates the aggregation, storage, processing, distribution and/or marketing of locally or regionally produced food products.	<ol style="list-style-type: none"> <li>1. Aggregation and distribution of wholesale products</li> <li>2. Active coordination of activities along the food supply chain</li> <li>3. Provision of permanent facilities for storage, packaging, processing, and sale</li> </ol>	Aggregation and distribution of locally produced foods	Increase small and midsized producers’ access to wholesale market channels
<b>Wholesome Wave</b>	Same as USDA (above), though with an expanded emphasis on the role of a community owned food market.	<ol style="list-style-type: none"> <li>1. Value-added food processing facility</li> <li>2. Storage and distribution system</li> <li>3. Community-owned food market</li> <li>4. Community shared kitchen</li> <li>5. Administrative (including education)</li> <li>6. General support</li> </ol>	Provide easy access, opportunity, and viability for small producers and low-income consumers	Contribute to a healthier, more vibrant, and equitable system
<b>Agricultural Urbanism, de la Salle and Holland</b>	A place that brings together a wide spectrum of land uses, design strategies, and programs focused on food to increase access, visibility, and the experience of sustainable urban and regional food systems within a city.	<ol style="list-style-type: none"> <li>1. Diversity of food and beverage retail and wholesale</li> <li>2. Processing and storage of food and beverages</li> <li>3. Institutions and educational opportunities</li> <li>4. Architectural and landscape design</li> <li>5. Diverse programming</li> </ol>	Place-based, promotion of food experience	Enhance the visibility and experience of local food systems within a city; connect food access to land use and design

approaches, including a focus on retail, wholesale, and processing, as well as on education and programming. De la Salle and Holland identify the key elements of a food hub as a diversity of wholesale and retail, processing, education and institutions, design, and programming.

These three definitions, along with the key elements, functions, and purposes, are summarized in table 1. These definitions are intentionally limiting. Limiting the scope of what a food hub is, and is not, helps organizations such as the USDA gain clarity about the challenges and opportunities facing the development of robust local and regional food systems. Accordingly, in exploring the potential for food hubs it is important to recognize and understand the limits imposed by particular definitions.

The USDA working definition emphasizes agglomeration and wholesale with little to no discussion of a retail or social component. This approach is well suited for certain kinds of enterprises, particularly regional distribution centers focused on serving the aggregation needs of farmers. However, the focus on business management systems and agglomeration activities ignores types of food hubs that do not operate from that kind of business-driven model.

The Wholesome Wave definition focuses on health and community. Its description emphasizes the participation by the broader community, particularly through a community-owned food market, community kitchen, and education. It also emphasizes the role of food hubs in improving access, opportunity, and viability for small producers and low-income consumers. On the other hand, the Wholesome Wave definition lacks an emphasis on the food hub's connections to other parts of the food system, including production, processing, waste management, and recycling.

Finally, de la Salle and Holland's food hub definition highlights the role of educational institutions and programming, as well as that of siting, design, and other place-based characteristics. Yet their definition falls short of making the explicit connec-

tions to the infrastructure needed to support local producers and strengthen the local food system. It also does not emphasize access by diverse populations.

### **Highlighting the Sustainable Food System**

Recognizing the limits of these focused definitions, we suggest that Kloppenberg et al.'s (2000) proposed list of sustainable food system attributes serves as a useful platform for creating a fuller understanding of the food hub phenomenon. The 14 attributes of a sustainable food system identified by Kloppenberg are:

1. ecologically sustainable
2. knowledgeable/communicative
3. proximate
4. economically sustaining
5. participatory
6. sustainably regulated
7. just/ethical
8. sacred
9. healthy
10. diverse
11. relational
12. culturally nourishing
13. seasonal/temporal
14. value-oriented (associative) economies

Several of these attributes directly encompass those identified by the USDA, Wholesome Wave, and de la Salle and Holland. For example, the attributes of "economically sustaining" and "value-oriented economies" speak to the role highlighted by the USDA of food hubs in supporting individually owned small and medium-sized farms and businesses through the provision of affordable aggregation, processing, and distribution infrastructure. Likewise, the "knowledgeable/communicative" and "participatory" attributes encompass and extend the concept of health-related services emphasized by Wholesome Wave and the programming and education highlighted by de la Salle and Holland. Kloppenberg's list also draws attention to possibilities for food hubs by including attributes not found in the three definitions discussed above, such as "sacred" and "culturally nourishing," although these terms may

be difficult to operationalize in practice. Kloppenberg's list provides a starting point for establishing a more comprehensive definition of food hubs.

### **A New Typology of Food Hubs**

We propose a typology that illustrates the broader range of forms that food hubs can take and the roles they can play. This typology builds on the list of existing food hub models outlined by the USDA, and a number of the examples listed are highlighted by the agency (2011). Other examples are from the Northwest, as the authors are more familiar with that region. This typology contributes to a better collective understanding of food hubs. In addition to addressing ownership, as was done by the USDA, our typology discusses other critical considerations, including purpose, design, and scale. The examples provided are illustrative and highlight the diversity of food hub types.

**Boutique/Ethnic/Artisanal Food Hub:** Often operates in one facility under single ownership, with a focus on artisanal, craft, and specialty food and beverage sales. Markets local produce, dairy, meat, and grains. Demonstrates strong and visible connections to local farmers and producers. May include a focus on particular ethnic and cultural foods.

*Example: Melrose Market, Seattle, Washington.* Melrose Market opened in 2010 and occupies two refurbished historic buildings in a dense downtown neighborhood. The small facility is owned by two developers who lease space to seven specialty food retail businesses and restaurants. The facility caters to affluent shoppers, and most of the stores feature local and artisanal foods. Some offer educational opportunities and food and wine tastings, and are transparent about their food choices. For example, the website of Homegrown, a sandwich shop, states that "Our goal at Homegrown is not only to create sandwiches out of sustainable ingredients but also to make sandwich creation sustainable itself... We consider our environmental impact for every ingredient choice, often between two competing theories: eating organic and eating local. We take the best from both worlds to create our sus-

tainable sandwiches. We like to call this sandwich environmentalism" (Homegrown, n.d., "Theory"). The Melrose Market businesses have a common atrium, offering a gathering place for customers and employees. Meanwhile, store owners have built mutually beneficial relationships, as noted in our conversations with them. For example, the market's restaurant features cheese and meat sourced from two other retailers in the building. In conversation, two store owners expressed their appreciation of the support and shared sense of purpose provided by the food hub-type setting.

**Consumer-Cooperative Model:** This type of food hub is initiated by an association of consumers who purchase in wholesale quantities from local producers for packing and redistribution to individuals.

*Example: Puget Consumers Co-op Natural Markets, based in Seattle, Washington.* Initiated in 1953, the Puget Consumers Co-op, known as PCC, is owned and operated by over 45,000 members, making it the largest consumer model in the United States (PCC Natural Markets, n.d.). There are nine retail outlets throughout the region at which both members and nonmembers can shop. PCC actively partners with local organic farmers to purchase produce, meat, poultry, dairy, and specialty goods, although products offered at the stores are globally sourced. As part of its efforts to support local farmers, PCC also supports a nonprofit land trust dedicated to preserving local farmland and transitioning it into organic production. In addition, PCC focuses on providing food-based education through activities such as cooking classes, podcasts, herb walks, and publications including newsletters and email digests.

**Destination Food Hub:** This is a large-scale facility or set of facilities where food-related retail businesses serve as a primary attraction for both local residents and tourists, and tourists make up a significant percentage of customers.

*Example: Pike Place Market, Seattle, Washington.* Pike Place Market is Seattle's most iconic and well-known public market. The nine-acre (4 hectare)

market is located in the heart of downtown and is operated by Pike Place Market Preservation and Development Authority, a nonprofit, public corporation chartered by the city of Seattle. Its founding law, the Market Charter, requires it to “preserve, rehabilitate, and protect the Market’s buildings; increase opportunities for farm and food retailing in the Market; incubate and support small and marginal businesses; and provide services for low-income people” (Pike Place Market Preservation Authority, 2003). It is home to more than 200 year-round commercial businesses (many of them food-related), 200 craftspeople, and approximately 100 farmers who rent table space by the day. In addition to a wide variety of raw food retail, there are processors (primarily cheese and beer making), vendors of value-added products (nuts, jams, dried fruit), and restaurants. The market attracts tourists as well as locals, totaling around 10 million visitors per year. There are educational offerings and programs throughout the year, ranging from a cheese festival to chef demonstrations. There is also a variety of services for low-income people, including subsidized housing, a health clinic, senior center, food bank, child care and preschool, and community kitchen. The market’s design includes elements that distinguish it from surrounding areas, not the least of which are the historic “Public Market Center” and “Meet the Producers” signs. Historic preservation and approval of new design features are overseen by the Market Historical Commission, which has a mandate to preserve the market’s physical and social character.

**Education and Human Service–Focused Food Hub:** This type of hub enables food-related community services such as community gathering places, community kitchens and processing facilities, SNAP and WIC benefit sign-up, agricultural skills training, healthy cooking and eating classes and demonstrations, and community garden and agricultural microenterprise project planning. Often includes demonstration and learning gardens. Access for low-income people is prioritized.

*Example: Growing Power, Milwaukee, Wisconsin.*  
Growing Power is a national nonprofit organization and land trust supporting people from diverse

backgrounds, and the environments in which they live, by helping to provide equal access to healthy, high-quality, safe and affordable food for people in all communities (Growing Power, n.d.). Growing Power’s prototype for a Community Food Center is a historic two-acre (0.8-hectare) farm and greenhouse operation in Milwaukee. The center hosts hands-on activities; large-scale demonstration projects, and growing space for some 20,000 plants, vegetables, and herbs; aquaculture; and a livestock inventory of chickens, goats, ducks, rabbits, and bees. There is also a retail store that sells produce, meat, worm castings, and compost to the community. The center offers schools, universities, government agencies, farmers, activists, and community members opportunities to learn from and participate in the development and operation of community food systems.

**Neighborhood-Based Food Hub<sup>1</sup>:** This hub type is defined by multiple contiguous city blocks with a high concentration of independent wholesale and retail food outlets. This district-style food hub provides access to diverse and healthy food options for local residents of varying income levels.

*Example: Chinatown-International District, Seattle, Washington.* The Chinatown-International District is a federally recognized historic district and a mixed-use urban neighborhood. Information was obtained from Internet sources including Google Maps and individual retailer websites, along with site visits. The district encompasses over 130 independent food establishments. These include over 85 restaurants; 16 bakeries, tea houses, and coffee shops; 12 grocers; three seafood markets; four wholesale outlets; and manufacturers selling poultry, soy products, noodles, and fortune cookies. There is also a culturally important community garden. The neighborhood serves as the cultural hub for Asian Americans in the area. The neighborhood’s food establishments and festivals, such as Lunar New Year, attract people

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<sup>1</sup> This typology could also be called a “food precinct” or “food district.” Food precinct is a term used by de la Salle and Holland. The term “food district” comes from literature on economic clustering.

living in the neighborhood, members of the greater Asian community, businesspeople, Seattle-area residents, and out-of-town visitors. There are many educational opportunities, including an assortment of classes, ranging from tea tastings at a tea house to Japanese Gardeners Association panels at a museum to teen cooking classes at a community center to “food tours” of the district. The Chinatown-International District exhibits many food hub characteristics, even though it was not intentionally developed around a specific food-related identity like many newer food hubs, nor is it internally identified as one.

**Online Food Hub Network:** This virtual food hub is an Internet-based online directory and marketplace that fosters efficient connections between local and regional food producers and consumers, including institutions, restaurants, and stores. It may have a physical location, but this is not necessary.

*Example: Puget Sound Food Network, Washington State.* The mission of the Puget Sound Food Network is to increase the production, distribution, and consumption of regionally produced food (Puget Sound Food Network, n.d.). Using a web-based platform, the network enables real-time communication and facilitates online food-related transactions between food producers, consumers, and other participants in the Puget Sound regional food system. Created and managed by the nonprofit Northwest Agriculture Business Center, the Puget Sound Food Network project enables farmers and other food producers to communicate conveniently and directly with buyers, locate processing, distribution, and storage facilities in the Puget Sound area, coordinate with other regional producers with complementary needs (for such items as bottles, boxes, and farm supplies), and consolidate products with other producers to meet growing consumer demand and potential delivery requirements.

**Regional Aggregation Food Hub:** This type includes a centrally located facility with a business management system that coordinates the aggregation, storage, processing, distribution and/or

marketing of locally or regionally produced food products. The facility is often actively managed and coordinated by one organization. Specific examples of regional aggregation food hubs include packing facilities, where fresh horticultural products are cooled, graded, packaged, and marketed to larger wholesale distribution centers and/or retail grocers. Wholesale terminals are another example. Wholesalers receive large quantities of fresh produce by rail, truck, and air from local sources and around the world for sale and distribution to grocers, restaurants, institutions, and other businesses.

*Example: Hunts Point Food Distribution Center, New York City.* The Food Distribution Center occupies a 329-acre (133-hectare) industrially zoned business park, covering about one third of Hunts Point Peninsula in New York City. It comprises a large concentration of food wholesalers, distributors, and food processing businesses. The major actors include the New York City Terminal Produce Market Cooperative, the Hunts Point Cooperative Market (a meat market), and the Fulton Fish Market (New York State Council on Food Policy, 2009). Each of these markets is among the largest of its kind in the world. The center distributes food locally, nationally, and globally.

**Rural Town Food Hub:** In this instance the hub is an entire rural town where relationships and strong connections between local food producers, processors, consumers foster a thriving local food economy. A high proportion of local residents are involved in promoting local alternatives to the global food system.

*Example: Hardwick, Vermont.* With a population of just over 3,000, Hardwick is home to numerous residents attempting to strengthen the local economy by building on the area’s historical roots in farming (Hewitt, 2010). They are doing so by returning to local, sustainable agriculture. Many of their food-related business owners, which Hewitt calls “agpreneurs,” share advice, capital, and facilities (Hewitt, 2010). Approximately 100 jobs have been created by these businesses, which include farms, specialty food processors, seed companies, and others. A major local actor is the

Center for Agricultural Economy. The center uses an entrepreneurial approach to support sustainable agriculture and bring together the community resources and programs needed to develop a locally based, sustainable, healthy, regional food system. The organization conducts strategic planning, provides support services to small food- and agriculture-based business owners and prospective owners, and is establishing a food business incubator.

**Hybrid Food Hub:** This type of hub is defined by a facility or set of facilities that integrates various kinds of activities described above, making it difficult to identify a specific type. Many existing food hubs function as hybrid food hubs. Eastern Market in Detroit, for example, is self-described as “a local food district with more than 250 independent vendors and merchants processing, wholesaling, and retailing food” (Eastern Market Corporation, 2007). In addition to a Saturday morning farmers’ market, Eastern Market also offers processing facilities, wholesale outlets, and a variety of educational programs and food-related services to the community. The market is managed by the Eastern Market Corporation. Another hybrid model is Local Food Hub in Virginia, a community-supported nonprofit service organization that provides the following services: planning support for growers, networking, refrigeration and freezer storage space rentals, liability and traceability coverage, delivery and consolidation services, and processing (Local Food Hub, n.d.)

### **Applying Definitions in Practice: An Analysis of Three Food Hubs in Seattle**

The typology above reveals the breadth of formulations about what might constitute a food hub. To gain a more in-depth understanding of the range of food hub possibilities, we conducted a qualitative study of three Seattle sites to illustrate the similarities and differences across food hubs, and to investigate our hypothesis that existing definitions do not sufficiently embrace the wide range of real-life food hubs. Melrose Market, Pike Place Market, and the Chinatown-International District were selected for these case studies because they represent food hubs across our typology’s spectrum, and

their location in Seattle made them accessible to the authors for in-person observation. The three study areas, identified in figure 1 and described above, are the Chinatown-International District, Pike Place Market, and Melrose Market.

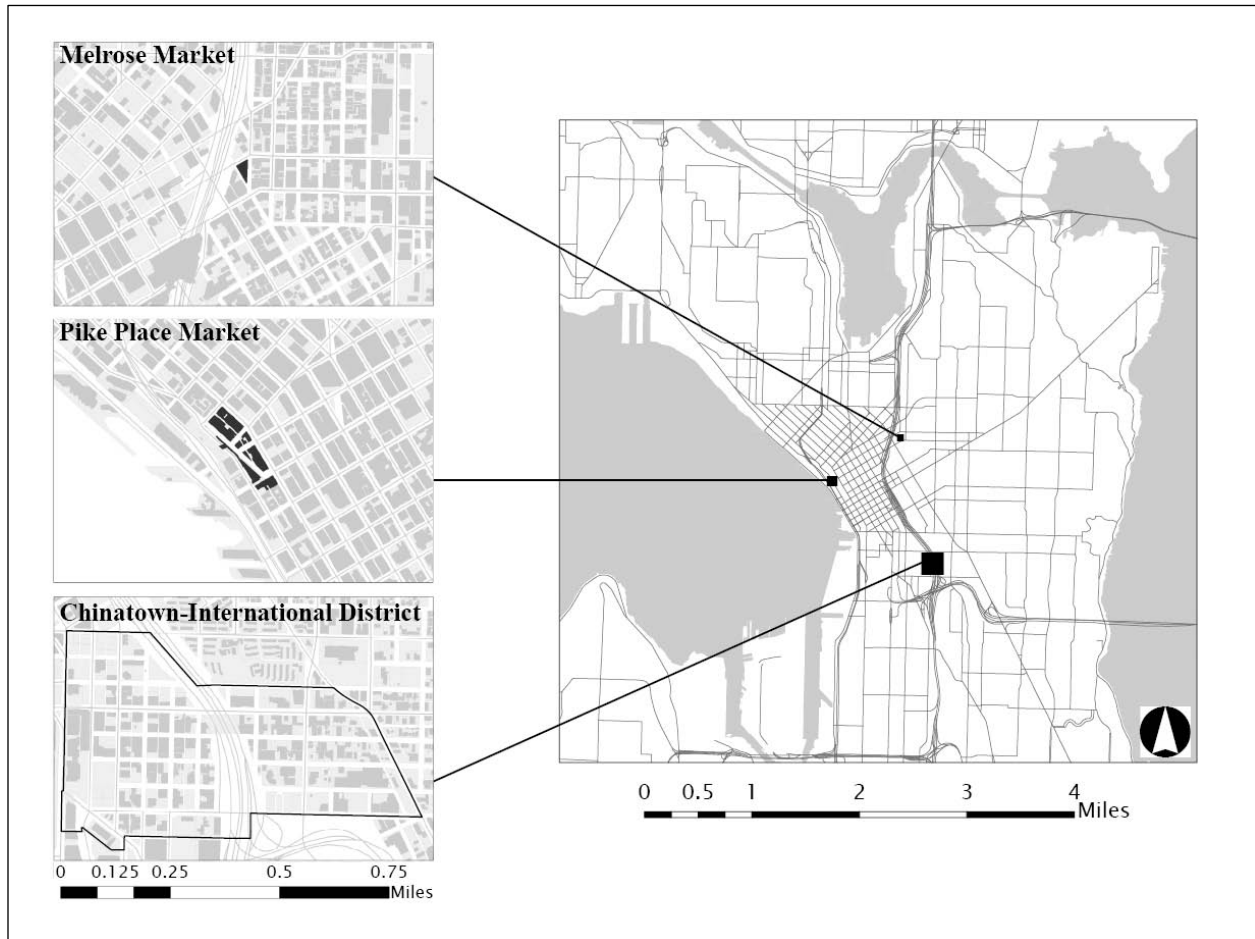
To conduct a consistent assessment of these sites, we developed a checklist-style matrix for on-site observation by a trained researcher. Additional sources of information included websites, city data sources, and personal conversations with stakeholders, such as the storeowners at Melrose Market. The matrix represents an expanded list of the elements defined by the USDA, Wholesome Wave, and de la Salle and Holland, identified in table 1, and of Kloppenberg’s 14 sustainable food system attributes. We examined the three food hubs to see how well they fit these approaches, and present summary results in table 2.

Of the three sites, Pike Place Market best fits each definition. Concordant with the USDA definition, Pike Place offers aggregation facilities and retail opportunities for local producers. As emphasized by Wholesome Wave, Pike Place also offers a wide array of social and human services in connection with its food offerings. Using de la Salle and Holland’s approach, Pike Place is characterized by its food-based wholesale and retail outlets, a diverse offering of food-related programming, and urban design and siting that provide transparency and access.

Similarly, The Chinatown-International District includes some of the processing elements highlighted by the USDA, community and social characteristics highlighted by Wholesome Wave, and educational and programming elements mentioned by de la Salle and Holland. Understandably, it lacks the explicit food-related public-private partnership that Pike Place Market has due to its geographical scale and history.

The smaller Melrose Market focuses more on retail opportunities and strengthening connections among producers, processors, and consumers, and does not have either the social service elements or the partnerships found in the other two food hubs.

**Figure 1. Three Food Hubs in Seattle, Washington**



Source: Washington State Geospatial Data Archive. (2011). Retrieved from <http://wagda.lib.washington.edu/>

These differences do not necessarily indicate a difference in the “success” of the food hub. Rather, these differences may be intentional. We identified five such additional considerations as we looked across our sites: audience, ownership structures, purpose, design, and scale. We will return to these elements below.

In addition to these five new considerations, we found that the strengths, viability, and vitality of each food hub we examined were attributable in part to things not adequately addressed by the definitions in common use. For example, we learned that an important aspect of Melrose Market is the network of relationships fostered among the various food-related businesses that compose the

larger facility. Likewise, Chinatown-International District serves an important role as a place for Asian Americans in the greater Seattle area to access affordable and culturally appropriate foods. Pike Place Market, meanwhile, fosters important connections between local residents and tourists to regional producers.

These examples indicate that a more expansive understanding of food hubs, including holistic attributes like Kloppenberg et al.’s (2000), would be useful. Such an understanding of food hubs would enable actors, including urban planners, to consider a wider range of possibilities when developing a food hub or adapting an existing one. For example, a more holistic approach would



**Table 2. Mapping Three Food Hubs to Different Definitions**

Food Hub	Food Hub Definitions Met by the Food Hub			Attributes of a Sustainable Food System
	USDA	Wholesome Wave	de la Salle and Holland	Kloppenber et al.
<b>Melrose Market</b>	The provision of permanent facilities	None	A diversity of food and beverage retail, some processing, architectural design, and some programming	Ecologically sustainable, knowledgeable/communicative, proximate, economically sustaining, sustainably regulated, healthy, relational, seasonal/temporal, and value-oriented (associative) economies
<b>Pike Place Market</b>	Aggregation and distribution facilities and the provision of permanent facilities	Site of multiple community services, including a food bank, community kitchen and educational classes	A diversity of food and beverage retail, some processing and storage, institutions and educational opportunities, architectural design celebrating the public market, and diverse programming	Ecologically sustainable, knowledgeable/communicative, proximate, economically sustaining, participatory, sustainably regulated, healthy, diverse, relational, seasonal/temporal, and value-oriented (associative) economies
<b>Chinatown-International District</b>	Aggregation and distribution facilities	Site of multiple community services, including grocery stores (with EBT access but not community-owned) and a food bank	A diversity of food and beverage retail, processing and storage facilities, institutions and educational opportunities, architectural design celebrating the cultural neighborhood attributes, and some programming	Ecologically sustainable, knowledgeable/communicative, proximate, economically sustaining, participatory, sustainably regulated, just/ethical, sacred, healthy, diverse, relational, culturally nourishing, seasonal/temporal, and value-oriented (associative) economies

encourage food hub developers to consider access by low-income residents in addition to the promotion of artisanal foods.

This larger framing would highlight important attributes that have not received attention in the discussion to date about food hubs. One is the relational nature of food hubs. Food hubs can actively coordinate food supply chain activities through a central business management system, as suggested by the USDA. However, there are other, more informal ways of building relationships and networks. For example, at Melrose Market, proximity, shared common space, and a sense of unified purpose help independent storeowners develop relationships based on reciprocity. One of the market's restaurants buys its bread from the neighboring baker and features wine from the wine store. These sorts of relationships may be defining characteristics of food hubs.

Other attributes worthy of more attention in food hub discussions are "seasonal/temporal" and "proximate." These attributes are emphasized both at Pike Place Market and Melrose Market, through the intentional support of local farms and promotion of seasonal and locally produced foods through signage and featuring them in menus. The "just/ethical" attribute deserves more exploration in its relation to food hubs and their development and evolution. Emphasized by Wholesome Wave, but only superficially mentioned by de la Salle and Holland or the USDA, is the notion that a food hub can promote spatial and economic access for people from all socioeconomic and cultural backgrounds to food and food-related health and social services. Food hubs can also actively facilitate the use of food assistance, including SNAP and WIC.

### Considerations for Decision-Making

Each definition contains a set of organizational and physical considerations. These considerations are important to the initial design or modification of a food hub. In terms of organizational considerations, there are many possible audiences, ownership structures, and purposes for food hubs. Design and scale are important physical considerations. Planners and other actors can ensure that decisions about the organizational structure and physical form consider the community's assets, needs, goals, and expected outcomes of the project.

#### *Audience*

Food hubs attract diverse audiences. The target clientele, whether neighborhood residents, tourists, low-income families, or large-scale food distributors, largely determines the type of food hub. A wholesale-oriented food hub, for example, clusters farmers and food processors so that wholesale food purchasers, such as schools or grocery stores, can purchase food from multiple sources at the same time. A retail-oriented food hub such as a consumers' cooperative serves residents of a city or neighborhood, as would a local market or grocery store.

At Pike Place Market, farm stands and specialty food stores sell to both residents and tourists alike. Melrose Market, meanwhile, attracts a specific, affluent customer base. Most of the stores feature higher-priced local and artisanal foods and some offer fee-based educational opportunities like wine tastings that appeal to their customers.

In addition to specialty foods and products that appear at boutique/ethnic/artisanal food hubs, an important consideration is spatial and economic access for low-income and food-insecure populations. Some food hubs promote access to both retail food outlets and food-related services and programming, such as nutrition classes and food banks. Growing Power, mentioned above, is one food hub that explicitly focuses on providing services and employment and training opportunities to low-income populations. Of the Seattle sites, the Chinatown-International District includes a food bank, community garden, and numerous

WIC and EBT-accepting retailers. Pike Place Market offers subsidized housing, a health clinic, and a food bank.

#### *Ownership*

As detailed by the USDA, food hubs have various ownership models, including nonprofit, producer/entrepreneur, public sector, and consumer-driven. When there is a single owner, it is often easier to establish a shared identity using strategies such as common marketing and signage. However, certain types of food hubs may exist and function without an identified leader, as in the case of the Chinatown-International District, a neighborhood-based food hub with multiple independently owned businesses but without a single guiding entity or manager. The closest proxies may be the business improvement association (which only covers half the area), the city of Seattle through its neighborhood planning process, or the design and development guidance required through its International Special Review District and National Historic Register District status — none of which specifically addresses food issues at this time.

#### *Purpose*

The purpose, or more likely purposes, of each food hub vary depending on ownership, market feasibility, and other considerations. In the case of the destination food hub Pike Place Market, the dominant purposes are tourism, place-making, and retail sales. The market is a major destination in downtown Seattle, providing a place for tourists to visit and locals to shop. For this reason, the Pike Place Market Preservation & Development Authority calls Pike Place the “soul of the city” (Pike Place Market Preservation Authority, 2010). In addition to the food-related businesses, Pike Place Market also hosts numerous specialty shops and street performers and works actively to maintain its historic character.

Melrose Market, on the other hand, was explicitly established as a profit-making venture. Secondary purposes include reusing historic buildings, demonstrating connections between local producers and a food-oriented public, and providing

opportunities for small start-up and independent food businesses.

In the Chinatown-International District, there is less of a shared purpose, as the food hub comprises multiple independent retailers without a common manager, spread across numerous city blocks. However, a common identity comes from the area's unique historical and cultural character. Chinatown-International District is also a tourist destination that includes some of the city's best Asian restaurants and specialty food markets.

There are more purposes, of course, than we found in our cases. One of the more forward-thinking ideas is that food hubs can be models for food-related sustainability efforts, including rooftop gardens, on-site composting, food reclamation, and waste reduction. The housing of Portland's food hub by the organization EcoTrust is an example of these connections.

### *Design and Siting*

Design is the means of tying together the purpose and processes of a food hub into a corresponding form. An important contribution of the de la Salle and Holland definition is their emphasis on the design elements of a food hub. Design and siting are also important aspects of the three Seattle food hubs.

Pike Place Market, for example, comprises a number of buildings constructed specifically for the purpose of hosting farm stands and numerous small businesses. Its open walkways encourage passersby and its concrete floors facilitate easy cleanup after busy market days. Meanwhile, it features numerous unique design elements, including a historic neon sign declaring "Public Market" that distinguishes it from the surrounding areas. Melrose Market, meanwhile, contains design elements related to the building's former use as an auto dealership. The designers adapted existing elements to make the space function as a food hub. For example, the market's triangular building was subdivided into small spaces for lease by small businesses.

De la Salle and Holland's definition is the only one we found that focuses on the physical setting and design characteristics of a food hub. We appreciate this, but call for more than their focus on agricultural architecture. Food hub design would be better served by an architectural design that is contextually appropriate and that allows for the rhythms of the food system's physical and social processes to occur as effortlessly as possible.

In terms of siting, food hubs can be located in rural areas, suburbs, urban villages, near transportation hubs including ports, in central business districts, and in residential neighborhoods. Siting is an important consideration that differs according to the context, but in general, a food hub needs to be accessible by its various potential users via multiple forms of transportation. For example, farmers and distributors may need truck access and parking, while local residents benefit from access by walking, biking, transit, and personal automobile. Siting may also offer opportunities for direct connection to food production, such as community gardens, rooftop gardens, and working farms.

One challenge to design and siting is that food hubs, as we have demonstrated, are not all alike. Some operate from one centrally managed facility or set of facilities, while others consist of independent structures without clear programmatic relationships. As an example of the latter, the Chinatown-International District is a historic district and a mixed-use urban neighborhood that has developed over time. Thus, the architectural and design details are historical and cultural, and the food hub characteristics observed in the area are circumstantial, not intentional. For example, many windows invite passersby to view live crabs and roasting ducks, while neon signs promote restaurant offerings. Yet these items are marketing features that predate the design concerns of agricultural urbanism and its related design features. Furthermore, while the district exhibits strong elements that visually distinguish the hub or precinct from surrounding areas, the majority of these features relate to the district's cultural identity (such as the Chinatown Gate) rather than food-specific items. Instead of agricultural architecture,

then, we prefer appropriate architecture for the local context that provides food hub–related benefits.

*Scale*

Scale affects the retail and wholesale mix and range of components of a food hub. There are different geographic scales of food hubs, from a single building to an entire neighborhood district. A small facility such as Melrose Market may be home to a handful of retail and wholesale establishments, while large-scale hubs such as Chinatown-International District and Pike Place Market may

be home to hundreds. Size also determines the range of components that can be included in a food hub. For example, Chinatown-International District encompasses a food-producing garden on a large hillside within the neighborhood, something that is difficult to plan for within a smaller-scale hub.

More than the other two areas we have explored, Melrose Market suggests that there is a relationship between the size of a food hub and the choices it must make among a range of possible features and functions. Melrose Market does not exhibit whole-

**Table 3. Important Food Hub Considerations: Audience, Ownership and Purpose, Design and Siting, and Scale**

Type	Boutique/ Ethnic/Artisanal	Destination Food Hub	Neighborhood-Based Food Hub
<b>Example</b>	Melrose Market, Seattle	Pike Place Market, Seattle	Chinatown-International District, Seattle
<b>Audience</b>	Generally higher-income consumers with a preference for artisanal and specialty foods.	Tourists and residents of all economic backgrounds, with a focus on those seeking locally produced foods.	Asian American community, businesspeople, local residents, and tourists.
<b>Ownership</b>	Melrose Project, LLC	Pike Place Market Preservation and Development Authority (PDA), a public development entity established under Washington State law	No single entity; multiple independent business owners. Some collective coordination by Business Improvement Association and by city of Seattle
<b>Purpose</b>	For-profit. Reuse historic buildings, create opportunities for small businesses, sell artisanal and local foods.	Its charter requires the PDA to preserve, rehabilitate and protect the market’s buildings; increase opportunities for farm and food retailing in the market; incubate and support small and marginal businesses; and provide services for low-income people. Also serves as a major tourist attraction.	Independent businesses are for profit. The mission of the Business Improvement Association is to promote economic vitality of the district, encourage responsible business development, and support continuous improvement of the quality of life in the district for its business owners, residents, and visitors. Serves as a cultural hub.
<b>Design and Siting</b>	Adaptive re-use of historic buildings. Located in dense urban neighborhood near downtown Seattle.	The market, comprising eight buildings and covering nine acres (4 hectares) in downtown Seattle near the waterfront, contains the Market Historic District. Includes some identifying historic signage.	Urban, federally recognized historic neighborhood. Cultural center for Asian Americans in region. Characterized by design elements like red dragons and lampposts.
<b>Scale</b>	One city block. Includes two refurbished buildings. Home to seven food-related businesses (of nine total) and a common atrium.	Home to more than 200 year-round commercial businesses; 190 craftspeople; approximately 100 farmers who rent table space by the day; 240 street performers and musicians; and more than 300 apartment units.	Mixed-use, dense urban neighborhood. Over 130 independent food businesses located in a ten-block radius, including several food processors and wholesale markets.

sale, storage, governmental services and institutions, production gardens, or educational opportunities. This is at least in part attributable to its smaller size and the fact that it was a redevelopment project in an expensive urban area, necessitating higher returns. Table 3 summarizes these considerations, demonstrating how organizational and physical considerations play an important role in shaping food hubs.

### **Role of Planners**

Planners, particularly those involved in food system planning, transportation, economic development, and neighborhood planning, should become familiar with food hubs given the various important roles and opportunities they present. Particularly as cities and regions seek to “relocalize” their food systems, these tools will need to be considered more frequently and rigorously. In the course of assisting communities to create or enhance food hubs, planners can help others involved understand the broad range of potential food hubs. They can assist in matching existing community needs and assets to the type of food hub most likely to achieve desired outcomes. The role of planners is increasingly critical as more and more municipalities engage in food hub development through policy-making, planning, program development, and/or partnerships.

In Washington state, the Port of Columbia is developing Blue Mountain Station, the “world’s very first destination eco-food processing park dedicated to the recruitment and marketing of artisan food processors, primarily in the natural and organic sectors” (Blue Mountain Station, n.d.). In the city of Everett, county and municipal officials have collaborated with the local farmers’ cooperative and a private developer to construct the city’s first indoor, year-round farmers’ market. Part of a mixed-use development featuring affordable housing, the 60,000-square-foot agriculture center will serve as a distribution hub, processing facility, and retail outlet. But Washington is by no means alone in these efforts; the National Good Food Network continually provides new examples of food hub development all over the United States on its website.

Perhaps most importantly, planners can help clarify how food hubs fit within the broader context of a sustainable food system and establish linkages among demographics, land use, transportation, and economic development. This would help ensure appropriate infrastructural choices for given places. For example, planners can help stakeholders consider the transportation, distribution, and freight infrastructure needs for a particular food hub location or type. They can identify zoning barriers and suggest creative solutions. Planners also can leverage relationships with policy-makers, local business and neighborhood associations, and food systems stakeholders to ensure that planning for and evaluating food hubs incorporate the voices and participation of diverse viewpoints. They can also bring together knowledge of different funding sources, grant programs, economic development agencies and public development authorities, and incentive packages that can be used to develop a successful food hub as part of a sustainable regional food system.

Planners can also play a coordinating role with stakeholders to adapt existing food hubs or develop new ones, and they can support networks of food hubs. Coordination might ensure that actors fully consider decision-making characteristics that relate to both processes of implementation and development of physical forms. This could include managing expectations and possible nuisances coming from the development of unfamiliar structures like food hubs. Planning for integrated networks of regional food hubs is a natural outgrowth of relocalization strategies. The Regional Food Hub Advisory Council of California identified ways that a regional food network can support and strengthen the operations of individual food hubs. These include facilitating interhub brokerage, tapping into existing infrastructure, and providing logistics services. In addition these key functions, other services and support include cost sharing, fundraising, training, and networking. Planners, who have skills in cross-sector thinking, assessment and analysis, and stakeholder engagement, would be natural members of this kind of coordinating body.

## Conclusion


This paper provides a background for existing definitions of food hubs and provides a new typology for better conceptual understanding. The timing is especially relevant, as the USDA intends to refine its working definition of food hubs (USDA, 2011). Honing the typology and refining the list of components and attributes will be helpful in establishing a useful and comprehensive definition.

Future research can also complement the current effort by the USDA and by the National Good Food Network, which involves focus groups and surveys, to develop a greater understanding of the scope and scale of existing food hub operations and their challenges and opportunities for growth. Other avenues for research include in-depth case studies of specific food hubs. Case studies could analyze the actors and motivations involved, development processes, and outcomes in both the local food system and local communities. One area of emphasis could be comparing intentionally planned food hubs with unplanned ones.

We recognize that there are important reasons for using a limited definition of food hubs, especially when guiding an organization's work. At the same time, we believe there is value in embracing a more comprehensive definition. Clearly, it will be a challenge to establish a definition that adequately addresses all the functions, purposes, attributes, and types of food hubs. Further, there is danger in developing the definition too much and thereby rendering it useless for focused application. A good definition will be broad enough to encapsulate the varying characteristics of most cases, but not so broad that any food enterprise could be called a food hub. We offer the following definition:

A food hub serves as a coordinating intermediary between regional producers and suppliers and customers, including institutions, food service firms, retail outlets, and end consumers. Food hubs embrace a spectrum of functions, purposes, organizational structures, and types, each of which can be tailored to

achieve specific community-established objectives. Services provided by a food hub may include and are not limited to aggregation, warehousing, shared processing, coordinated distribution, wholesale and retail sales, and food waste management. Food hubs contribute to strengthening local and regional food systems as well as to broader community goals of sustainability and health.

Clearly, the conversation regarding food systems and food hubs is evolving and will continue to grow in significance. 

## References

- Barham, J. (2010, December 14). Getting to scale with regional food hubs [Blog post]. Retrieved from <http://kyf.blogs.usda.gov/2010/12/14/getting-to-scale-with-regional-food-hubs/>
- Blue Mountain Station. (n.d.). Why a food park? Why organic? Retrieved from <http://www.bluemountainstation.com/about/why/>
- The Center for an Agricultural Economy. (n.d.). Retrieved from <http://hardwickagriculture.org/>
- Connell, D. J., Smithers, J., & Joseph, A. (2008). Farmers' markets and the "good food" value chain: A preliminary study. *Local Environment*, 13(3), 169–185. <http://dx.doi.org/10.1080/1354983070166909>
- De la Salle, J., & Holland, M. (2010). *Agricultural urbanism: Handbook for building sustainable food and agriculture systems in 21st century cities*. Vancouver, BC: HB Lanarc.
- Eastern Market Corporation. (2007). Detroit Eastern Market. Retrieved from <http://www.detroiteasternmarket.com/>
- Ecotrust. (2011). About Food Hub. Retrieved from <http://food-hub.org/>
- FamilyFarmed.org. (2010). Ready to grow: A plan for increasing Illinois fruit and vegetable production. Retrieved from <http://ngfn.org/resources/ngfn-database/knowledge/IllinoisProduceReport-final.pdf>
- FamilyFarmed.org and Wallace Center. (2010). Local food system assessment for northern Virginia. Retrieved from <http://www.wallacecenter.org/our-work/Resource-Library/wallace-publications/Northern-VA-LFS-Assessment-Final-Report.pdf>

- Gerencer, M. (2011). *Healthy food purchasing: Farms to schools, cities, hospitals, jails, and other institutions*. Presentation at Communities Putting Prevention to Work Coalition Meeting, King County, Washington, April 26, 2011.
- Growing Power, Inc. (n.d.). About us. Retrieved from <http://www.growingpower.org/>
- Hewitt, B. (2010). *The town than food saved: How one community found vitality in local food*. Emmaus, Pennsylvania: Rodale Books.
- Homegrown Sustainable Sandwich Shop. (n.d.). Theory. Retrieved from <http://www.eathomegrown.com/theory>
- Kallus, R., & Law-Yone, H. (2000). What is a neighbourhood? The structure and function of an idea. *Environment and Planning B: Planning and Design*, 27, 815–826. <http://dx.doi.org/10.1068/b2636>
- Kloppenber, Jr., J. K., Lezberg, S., Master, K. D., & Stevenson, G. W. (2000, Summer). Tasting food, tasting sustainability: Defining the attributes of an alternative food system with competent, ordinary people. *Human Organization*, 59(2), 177–186.
- Local Food Hub. (n.d.). How we work with buyers. Retrieved from <http://localfoodhub.org/our-food/how-we-work-with-buyers/>
- Morley, A., Morgan, S., & Morgan, K. (2008). Food hubs: The “missing middle” of the local food infrastructure? BRASS Centre, Cardiff University. Retrieved from [http://www.ngfn.org/resources/ngfn-database/knowledge/Food\\_Hub\\_KM0908.pdf/view](http://www.ngfn.org/resources/ngfn-database/knowledge/Food_Hub_KM0908.pdf/view)
- National Good Food Network. (2011). Regional food hubs: Linking producers to new markets. Retrieved from [http://www.ngfn.org/resources/ngfn-database/knowledge/RFHub%20Presentation\\_complete%20version\\_5.24.pdf/view](http://www.ngfn.org/resources/ngfn-database/knowledge/RFHub%20Presentation_complete%20version_5.24.pdf/view)
- New York State Council on Food Policy. (2009). Hunts Point Terminal Produce Market. Retrieved from [http://www.nyscfp.org/.../Hunts\\_Point\\_Terminal\\_Produce\\_Market-Madelyn\\_Wils.pdf](http://www.nyscfp.org/.../Hunts_Point_Terminal_Produce_Market-Madelyn_Wils.pdf)
- Occidental College Urban and Environmental Policy Institute. (n.d.). Regional food hub and regional food hub network. Retrieved October 30, 2011, from <http://departments.oxy.edu/uepi/cf/rfh.htm>
- Pike Place Market Preservation Authority. (2003). Charter. Retrieved from [http://www.pikeplacemarket.org/market\\_organizations/pda\\_council\\_committees](http://www.pikeplacemarket.org/market_organizations/pda_council_committees)
- Pike Place Market Preservation Authority. (2010). History of Pike Place Market. Retrieved from [http://www.pikeplacemarket.org/visitor\\_info/market\\_history](http://www.pikeplacemarket.org/visitor_info/market_history)
- PCC Natural Markets. (n.d.). About PCC. Retrieved from <http://www.pccnaturalmarkets.com/about/>
- Puget Sound Food Network. (n.d.). Retrieved from <http://www.psfm.org/>
- Regional Food Hub Advisory Council. (2010). A California network of regional food hubs: A vision statement and a strategic implementation plan. Retrieved from <http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5091490>
- Smith, D. (2011, January 8). Year-round public market set for Everett. *The Herald Net*. Retrieved from <http://www.heraldnet.com/article/20110108/NEWS01/701089940>
- United States Department of Agriculture (USDA), Agriculture Marketing Service (AMS). (2011). Regional food hubs: Understanding the scope and scale of food hub operations (PowerPoint slides). Retrieved from <http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5090409>
- Wholesome Wave. (n.d.). Healthy food commerce initiative. Retrieved from <http://wholesomewave.org/hfci/>
- Wholesome Wave. (2010). The food hub. Retrieved from [www.safsf.org/documents/FoodHubResearch\\_Present\\_101210.pdf](http://www.safsf.org/documents/FoodHubResearch_Present_101210.pdf)





## Satiating the demand: Planning for alternative models of regional food distribution

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### Abstract

Despite the relative absence of wholesale distribution in much of the planning profession's academic and grey literature, emerging models promise to remake the relationship between producers and their regional markets. In this article, key lessons from the value(s) chain literature are illustrated with examples from comparative case studies conducted by the University of Wisconsin–Madison Center for Integrated Agricultural System to acquaint professional planners and allied professionals with strategies for imbuing mid- to high-volume local food distribution with normative values such as transparency and fairness. The research presented here is not a comprehensive

analysis of regional wholesale food distribution. Rather, we have focused on organizational, logistical, and marketing characteristics of local and regional food value(s) chains. We utilize an exploratory comparative case study method to identify innovations in food distribution focusing on midtier food value(s) chains. We then describe larger system interventions that planners could employ to better accommodate midtier food distribution needs in the regional planning and food regulatory environment. These interventions include documentation of existing wholesale food system infrastructure; incorporation of agricultural industry clusters into regional economic development planning; cultivation of regional culinary identities to enhance marketing and branding efforts; and collaboration with policy makers and food safety regulators to foster zoning and regulation that protect public safety and welfare and

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build the capacity and market access of local food entrepreneurs.

### Keywords

business models, food distribution, food system planning, food systems, value chains

### Introduction

In June 2010 four professional associations, the American Dietetic Association, the American Nurses Association, the American Planning Association (APA), and the American Public Health Association, convened in order to develop a set of shared principles to orient practitioners and associations in their work transforming the food system. Following are the principles detailed in the resulting document, *Principles of a Healthy Sustainable Food System* (American Dietetic Association, the American Nurses Association, the American Planning Association, and the American Public Health Association, 2010):

- health-promoting
- sustainable
- resilient
- diverse in scale, geography, culture, and food choice
- fair for farmers, workers, and eaters
- economically balanced
- transparent

This set of principles, along with other professional pronouncements like the 2007 APA *Policy Guide on Community and Regional Food Planning* (American Planning Association, 2007), are substantial responses to rapidly increasing interest from many professional societies and policy makers for information and resources about how to build sustainable, community and regional food systems.

For at least a decade, urban and regional planners have worked to establish and advance these objectives in the food system by facilitating farmland conservation initiatives, promoting and streamlining permitting processes for farmers' markets, expanding urban agricultural activities through innovative zoning code revisions, and increasing community access to fresh food through super-

market attraction initiatives and improved accommodation of Supplemental Nutrition Assistance Program (SNAP) (formerly food stamps) and Women, Infants and Children (WIC) supplemental food benefits at farmers' markets. Taken together, these advances have expanded farmers' access to local markets and consumers' access to fresh product. Still, noticeably absent from this list of accomplishments is planners' participation in supply chain development and high-volume distribution. Perhaps this absence is best explained by Pothukuchi and Kaufman's observation that many planners perceive the food system as being driven primarily by the private market (2000). This may be especially true for issues pertaining to supply chain coordination, which superficially appear further outside the purview of planning practitioners than issues pertaining to agricultural land use and household hunger.

Nevertheless, as local and regional food systems scale up to accommodate the growing demand for local food and bridge the gap between alternative and industrial food systems, food supply chains necessarily become more complex, and new knowledge is needed about how to incorporate normative values into supply chain dynamics. Toward this end, our thesis is that urban and regional planners and allied professionals could learn a great deal from food value(s) chains research and development about how to imbue principles such as scalar diversity, fairness, and transparency into the configuration of local and regional food distribution. In this article, we identify three critical components of midtier food value(s) chains — aggregation, transparency and source identity throughout the supply chain, and fair pricing practices — and discuss how they are expressed in three case studies produced by the University of Wisconsin—Center for Integrated Agriculture Systems (CIAS). The cases examined here are the Organic Valley Produce Program, Coop Partners Warehouse, and Growers' Collaborative. We close by proposing interventions that would help make planning processes and regulatory environments more supportive of the formation of food value(s) chains.

## Defining Characteristics of Local Wholesale Food Value(s) Chains

In this section we define food value(s) chains and identify three characteristics of local and regional food distribution models that show the greatest potential for integrating efficiency and equity across the local food supply chain. Stevenson and Pirog define midtier food value chains as “values-based strategic alliances between midsize independent (often cooperative) food production, processing, and distribution/sales enterprises that seek to create and retail more value on the front (farmer/rancher) end of the chain, and effectively operate at regional levels with significant volumes (Stevenson & Pirog, n.d., p. 19).”<sup>1</sup> As follows, food value(s) chains are distinct from traditional food supply chains both because they attempt to distribute risk and profit more evenly across the supply chain, and because they differentiate their products in the marketplace on the basis of their social and environmental attributes. Here “midtier food value chains” is shortened to “food value(s) chains” rather than “value chain” to denote both the normative values they encompass and the incremental value added to agricultural products as they move from field to fork.

The food value(s) chain literature (Barham, 2008; Day-Farnsworth, McCown, Miller, & Pfeiffer, 2009; Stevenson & Pirog, 2009) has identified a range of critical issues pertaining to food value(s) chains, including concerns regarding collective action (Lev & Stevenson, 2011), “adequate capitalization and competent management” (Stevenson, 2009, p. 11), the “fair pricing dilemma” — the fact that “business models designed to help producers retain a larger percent of the retail food dollar typically operate at price points that make their products unaffordable to low-income markets” (Day-Farnsworth, Bruner Zimmerman, & Daniel, forthcoming), and under-representation of people of color in entrepreneurial and organizational leadership positions within alternative and local food systems (Morales, forthcoming). Food

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<sup>1</sup> According to the USDA, U.S. consumer demand for locally grown foods could reach US\$7 billion by 2012, nearly double the demand in 2002 (USDA, 2009).

value(s) chains face significant challenges in all of these regards, and each warrants further attention. However, here we choose to focus specifically on organizational, logistical, and marketing characteristics of local and regional food value(s) chains with two goals: (1) to acquaint planning practitioners with the critical components of midtier value(s) chains, and (2) to identify the considerations salient to the planning and regulatory interventions proposed at the conclusion of the article. Following are short explanations of the function and importance of aggregation, transparency and source identity, and fair pricing practices in regional food value(s) chains.

### *Aggregation*

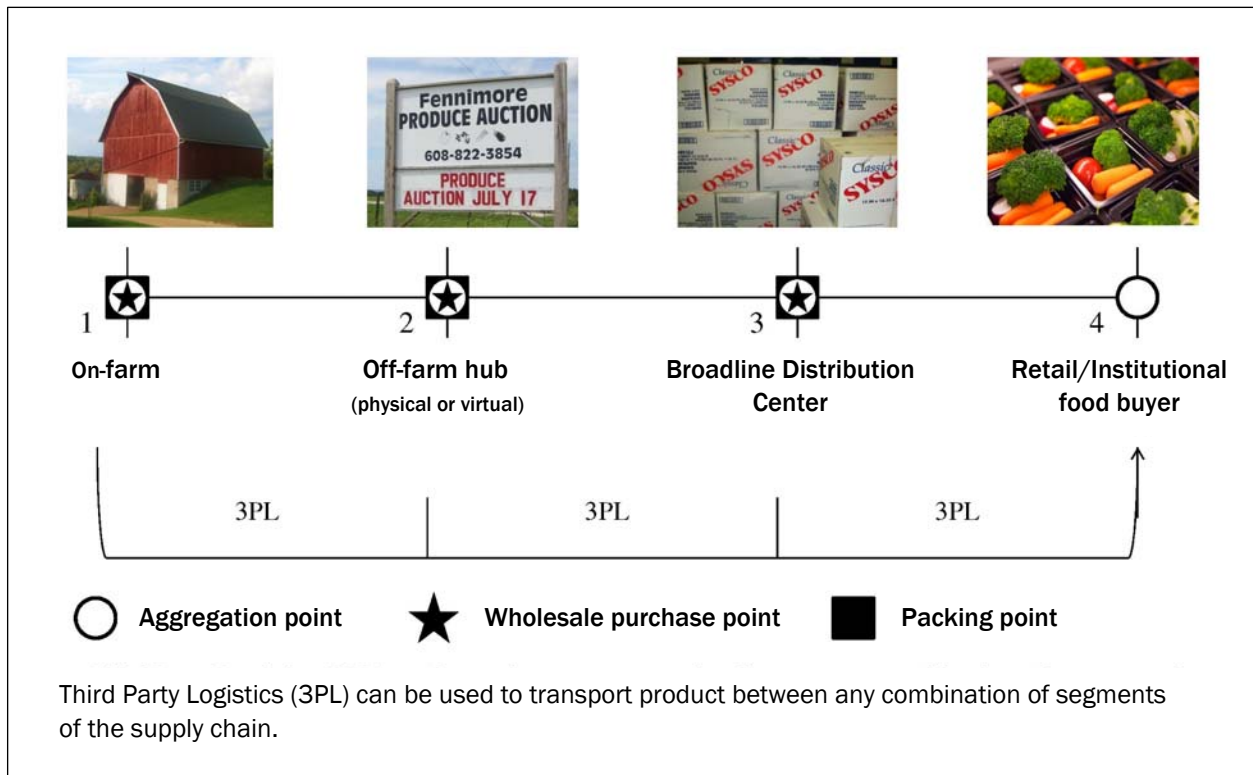
Aggregation is one of the first crucial post-harvest activities in many midvolume value chains. The University of Wisconsin Center for Integrated Agricultural Systems defines aggregation as “the consolidation of products sourced from multiple growers (Day-Farnsworth et al., 2009, p. i).”<sup>2</sup> Product aggregation achieves one or both of the following goals: (1) to diversify the number of product offerings; and (2) to achieve large volumes of a single product. Distributors and/or groups of small and midsize growers aggregate product to compete with large growers in local and regional retail and institutional markets. In many instances, aggregation for wholesale markets is employed to increase volume and diversify product offerings.

Figure 1 illustrates distinct points along the fresh produce supply chain at which farm product is aggregated and sold. Aggregation Point 1 is characteristic of direct-marketing such as Community Supported Agriculture (CSAs) and farm stands (i.e. the farmer sells product directly to the end consumer). Farm identity is usually preserved at this transaction level. Aggregation Point 2 adds a “hub”

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<sup>2</sup> With regard to these value chains, Stevenson and Pirog (n.d.) define “significant volumes” as those ranging between direct-marketing and commodity system quantities, noting that levels will vary with geography, geographic identities, food products, and market demographics.

**Figure 1. Aggregation Points and Distribution Paths Across the Local/Regional Food Supply Chain**



link to the supply chain to aggregate from many producers, thus diversifying product, increasing

volume, or both. Such aggregation may take the form of a physical structure such as a packhouse and produce auction, or it might manifest as a virtual hub where multiple farms' inventories are listed to enable one-stop-shopping for large volume buyers. At this aggregation point, farm product may retain farm identity, be branded by the aggregation entity, or both. Aggregation Point 3 extends the supply chain by introducing broadline distributors such as Sysco, which usually source through a combination of farm-direct transactions and off-farm hubs. Characteristic of industrial food distribution, farm identity is typically lost when broadline distributors administer aggregation. Aggregation Point 4 represents on-site aggregation by institutional and retail customers. Although this aggregation point may appeal to small growers accustomed to direct sales, wholesale buyers seek efficiency by substituting many suppliers, for fewer broadline

distributors because of the diverse product lines and one-stop-shopping they provide (Day-Farnsworth et al., 2009).

*Transparency and Source Identity*

The "Ten Reasons to Buy Local Food" list published by University of Vermont Extension (Grubinger, 2010) echoed the sentiments of many local food advocates in making the claim, "There's a unique kind of assurance that comes from looking a farmer in the eye at farmers' market or driving by the fields where your food comes from. Local farmers aren't anonymous and they take their responsibility to the consumer seriously." This statement captures an essential element of the local food movement: the consumers' desire to reconnect with their food.

A 2010 publication by the University of Wisconsin Center for Integrated Agricultural Systems depicts "The Tiers of the Food System" (see figure 2), a conceptual tool that illustrates how supply chain relationships change as scale (both volume and

**Figure 2. The Tiers of the Food System**

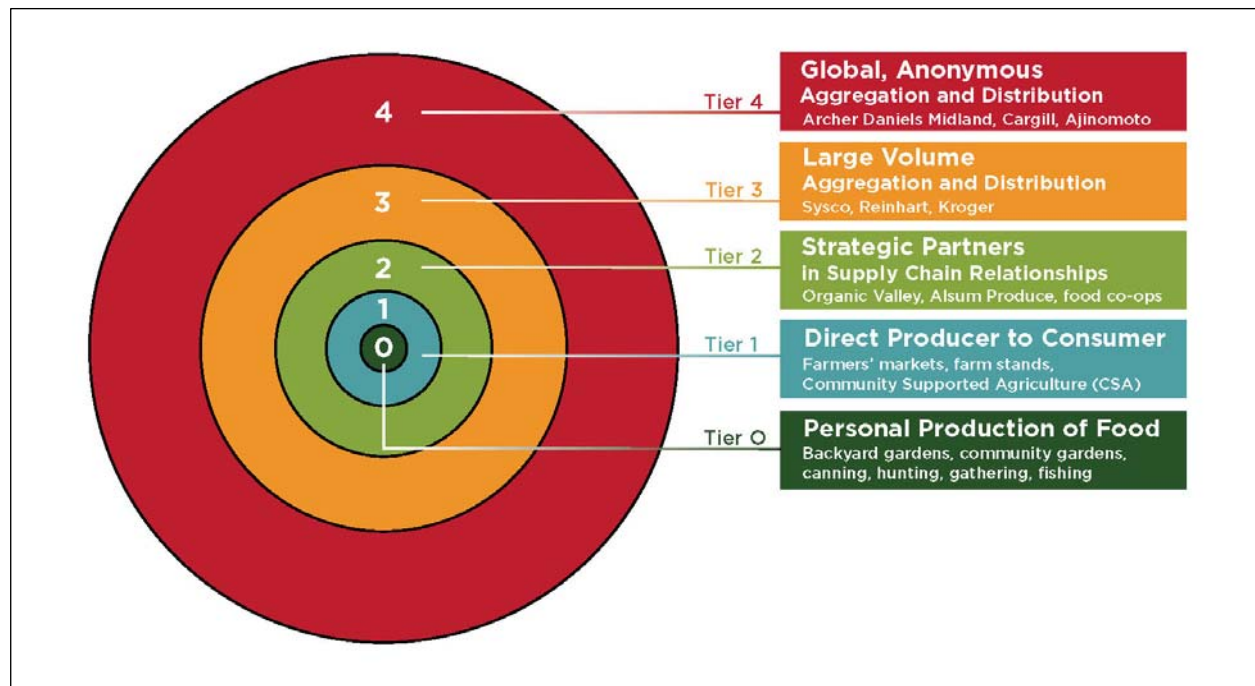


Image courtesy of University of Wisconsin–Madison Center for Integrated Agricultural Systems.

geographic distance) increase. As indicated in figure 2, the most notable shift is the loss of transparency we observe as a consumer moves from the inner spheres of the diagram, which represent per-

sonal food production and direct-marketing, to the outermost sphere, which represents highly processed, global, anonymous food products such as energy drinks, chicken nuggets, and cheese puffs. Further examination reveals that this transparency also generally corresponds to the percentage of the retail food dollar captured by the farmer. For example, if you buy a pound of apples directly from the grower at a farm or farmers' market (high levels of transparency about product origin), the farmer gets to keep the total value of that sale (high percentage of the retail food dollar), but if you purchase a pound of apples at a grocery store (lower level of transparency about product origin), the retailer alone may retain 40 cents on the dollar (correspondingly, the grower retains a lower percentage of the sales price).

Arguably, the strength of direct-marketing strategies such as farmers' markets, CSAs, u-pick operations and other agritourism activities is two-fold: they are effective ways to help reconstruct the relationship between consumers and their food, and they can be economically beneficial for local producers. In this regard, direct marketing exemplifies the beneficial attributes of the local food system, evincing the claim that the local scale, insofar as it increases farmer-consumer proximity, is particularly well positioned to foster normative and descriptive values such as fairness and transparency in local food supply chains. Parenthetically, it is also worth mentioning that farmers' markets are not always profitable for producers. Even if a farmer can make US\$5.50 per quart for strawberries, she would have to sell more than 80 quarts of strawberries a week to make a living wage in Madison, Wisconsin, which is unlikely given the foot traffic and consumer-purchasing power at many farmers' markets. However, even when it is profitable for individual growers, *direct marketing is an impractical means of moving high volumes of local prod-*

*uct into venues such as retail grocery stores and cafeterias because farm-direct sales typically move small quantities of product, while retail and institutional buyers would prefer to buy larger volumes from fewer suppliers.*

Further, research indicates that wholesale markets are not to be overlooked; according to a 2008 report by the Hartman Group, 62% of consumers say they primarily purchase local food at grocery retailers, making grocery retailers an important target market for local food producers. As the supply chain lengthens, producers selling into local wholesale markets need to find new ways to connect to buyers, particularly if they want to capture a premium for local product in the competitive grocery retail marketplace.<sup>3</sup> Day-Farnsworth et al. corroborate other value(s) chains research findings that in order for producers “to capture a premium, buyers and consumers need to know about the unique origins of local and regional food, and how it is grown...in many instances, storytelling and transparency about production practices supersede third party certification as means of product differentiation” (2009, p. ii) Examples of local product branding and differentiation range from having in-store meet-the-farmer product tastings to posting farm names and farmer profiles at the point of sale to affiliating with reputable regional brands. Other examples from three of the University of Wisconsin–Madison CIAS case studies are described in the appendix and in the discussion below.

### *Fair Pricing*

As described above, in direct marketing, producers are typically price-makers insofar as they are able to set their prices as high as their markets allow. By contrast, producers who sell into commodity markets are typically price-takers and must capitulate to terminal market pricing regardless of their cost of production. Stevenson, Clancy, King, Lev, Ostrom,

& Smith (2011) point to midtier supply chains as a potential “sweet spot,” where economies of scale meet socially and environmentally differentiated product, making it possible for meaningful price negotiations to take place between producers and buyers. Price negotiation is at the crux of strategic supply chain relationships because it implies an interdependency between producers and buyers and suggests that both parties recognize the value that the other brings to the partnership. For buyers, the benefit likely pertains to product quality and consistency in supply; for producers, the benefit is a fair price for their product and access to markets they may not be able to reach through direct sales. As a rule, fair pricing hinges on cost-of-production, wherein producers must have working knowledge of their input and labor costs and in turn receive “cost-of-production plus” prices that cover the cost of production and incorporate profit margins along the value chain.

Several key lessons emerge from this brief overview of aggregation, transparency and source identity, and fair pricing. First, product aggregation is possible at every point along the supply chain. Second, as supply chains lengthen, product volume usually increases while farm identity is lost. Bolstering marketing and merchandising efforts that tell a farm and product’s story is an effective approach to resolving the loss of transparency and source identity and helps producers capture a premium for local products sold through grocery retailers and institutions. Finally, price negotiations based on cost-of-production-plus-profit pricing help ensure that premiums captured in high-volume transactions are fairly distributed across the supply chain. Altogether, these lessons imply flexibility in supply chain design, but they also raise questions about the costs and benefits of different supply chain configurations and branding strategies. Our research explored how organizations responded to distinct circumstances in organizing food value(s) chains.

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<sup>3</sup> For example, if a local producer’s apples are not farm-identified or labeled as local but they cost 10%–30% more than the nonlocal apples on the shelf next to them, producers and retailers alike will find it difficult to move the local apples even when market research points to a rising demand for local product.

## Comparative Case Study Analysis

### *The Baldwin Local Food Distribution Project*

Since 2008, a growing number of case studies have investigated the inner workings of community food systems and regional food distribution networks (see Barham, 2008; Dreier & Taheri, 2008; Maye, Holloway, Kneafsey, 2007; Starr, Card, Benepe, Auld, Lamm, Smith, & Wilken, 2003; and Zajfen, 2008). The majority of these are exploratory case studies focused on farmers' markets, CSAs and other predominantly farm-direct distribution methods. While these studies have generated a wealth of information about the innovations and challenges on the ground, case studies of individual organizations are not designed to discover variation in the goals and organization of food distribution. Furthermore, little existing research peers into the "black box" logistical and organizational bottleneck through which food flows in intermediated food supply chains, i.e., supply chains that incorporate distribution and/or logistics partners other than the farmer and the buyer. Launched in January 2008, the University of Wisconsin Baldwin Idea grant program funded the Center for Integrated Agricultural Systems to establish the Local and Regional Food Distribution Project with the goal of understanding how various successful midscale local and regional food distributors function and the barriers they face, in order to develop appropriate programmatic, policy, and regulatory remedies.

### *Methods and Research Questions*

Our research used the working hypothesis that organizations involved in midsize regional food distribution were pursuing different goals by different organizational strategies than those of the "industrial" food system. We based this working hypothesis on the fact that food value(s) chains, like "fair trade" supply chains, would necessarily incorporate goals and organizational models distinct from organizations devoted mostly to maximizing profit. The central research questions of the Baldwin study were three: what are the organizational and operational characteristics of successful midscale regional distribution operations? How are these characteristics expressed across the case

studies? And what barriers and opportunities do these organizations encounter in their efforts to distribute local product?

Researchers initiated collaborations with the Wallace Center<sup>4</sup> and the United States Department of Agriculture (USDA) who were independently pursuing research on food distribution. While the population of values-driven food distribution organizations is growing rapidly, no professional associations exist in this organizational landscape, so there was no formal clearinghouse to approach for a comprehensive list of organizations involved in midsize regional food distribution. Therefore, these collaborations expanded our sample size, which enabled us to increase the scope of the Baldwin project beyond Wisconsin to capture innovations in other parts of the country. Researchers used systematic, snowball, and purposive sampling strategies to establish a database of 68 food distribution entrepreneurs serving local or regional markets. This database included the work of the Wallace Center, webinar participants in the USDA Cooperative State Research Education and Extension Services Family Farm Forum (USDA CSREES, 2008), and attendees from the 2008 Community Food Security Coalition conference. Our initial interviews with nearly two dozen businesses gave us an understanding of the range of goals, business models, and organizational strategies. We used this preliminary analysis to select 11 organizations for more in-depth analysis (an initial report is Day-Farnsworth et al., 2009). Since we were interested in exploring the organizational and ideological diversity of the mediating organizations in the industry, we selected cases on three criteria: (1) representation of diverse locations, scales, and forms of business organization; (2) emphasis on enterprises supplying primarily wholesale markets (e.g., grocery retailers, broadline distributors, institutional food service operators, and restaurants); and (3) aggregation and distribu-

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<sup>4</sup> The Washington, D.C.-based Wallace Center at Winrock International utilizes research, policy analysis, and education to support market-based reforms to the food system (Winrock International Wallace Center, 2009). See <http://www.winrock.org/wallace/>

tion models that share the characteristics of value(s) chains as defined at the outset of this article. Based on ongoing analysis, we selected three organizations whose work made for particularly clear and illustrative lessons about how mid-tier food value(s) chains are developing; other writing projects will elaborate these developments and appropriately amplify the discussion here.

Thus, given the exploratory nature of our work, we asked, “what is this organization, activity, or practice a case of?” instead of, “where are the cases that fit a particular idea about food distribution?” Again, generalization was not our goal; identifying and comparing practices were our fundamental tasks. At each of our three rounds of interviews we reviewed and fine-tuned our interview guide, vetting and testing it prior to reengaging our selected organizations. Then we conducted in-depth phone interviews with CEOs or high-level managerial or marketing staff from each organization. Follow-up communications clarified and expanded on information that surfaced in the interviews. We followed the typical protocol of questioning our interviewees to the “saturation” point, i.e., the point where we were no longer learning new information. The case studies referenced here were selected for their unique approaches to incorporating normative and descriptive values outlined in the *Principles of a Healthy Sustainable Food System* pronouncement, such as fairness and transparency through particular mixtures vis-à-vis supply chain configuration, price-setting, and marketing.

### *Discussion*

The following is a discussion of key themes issuing from the Baldwin case studies as they pertain to our core interests in aggregation, transparency and source identity, and pricing. Illustrative examples are drawn from three organizations (The Organic Valley Produce Program, Co-op Partners Warehouse, and Community Alliance with Family Farmers) to illuminate specific challenges and innovations to mid-tier food value(s) chains. The variation across these organizations demonstrates that there are multiple ways mid-volume food value(s) chains can wed the transparency and higher producer returns typical of direct marketing

with the volume, efficiency, and regulatory climate characteristics of larger-scale food operations. Each subsection concludes with examples of how planners and allied professionals can foster improvements in mid-volume local and regional food distribution. An overview of each organization and description of these components of their operations are provided in the appendix.

### *Aggregation*

Each of the organizations profiled in this article aggregates product from tens of small and midsize producers. Tracking relatively small volumes of product from multiple sources and ensuring quality and consistency across commingled product can be difficult without adequate systems. These case studies point to a need for improved post-harvest handling infrastructure that would allow for better quality control through centralized grading and packing facilities and more efficient transport. Two distinct but related issues emerged in this regard: first, expanded physical infrastructure is needed to facilitate these activities, and secondly, business savvy is needed to appropriately pace such expansion. Here we elaborate on these issues with examples from the case studies and discuss ways in which planning professionals could support these activities and improve coordination between business decisions affecting economic development (e.g., business siting, financing, and expansion) and transportation planning considerations.

One of the challenges with improving quality control and transportation involves securing funding for infrastructure development. Traditional grant and loan options can be difficult to secure for small and mid-sized growers and food distributors because of perceived risk by funders. However, financing strategies historically utilized by urban and regional planners for commercial development are starting to be employed to fund “food hubs,” which are centralized (often multi-organizational) facilities designed for grading, packing, and processing product. These financing strategies may present promising alternatives. For example, recent efforts in St. Louis, Missouri, successfully leveraged US\$4.5 million in Tax Incremental Financing (TIF) funds as part of the total financing package for the



St. Louis Food Hub (Randol, 2011). Similarly, some rural areas have effectively leveraged public funds to help build rural economies through food-based business and infrastructural development. In August 2010, the city of Viroqua and the Vernon Economic Development Association in Vernon County, Wisconsin, received a US\$2 million grant from the U.S. Economic Development Administration to help convert an empty manufacturing plant into a local food hub (Wisconsin Department of Commerce, 2010).

Another important finding of the Baldwin research was that rather than expanding immediately into processing, storage, and distribution, both Organic Valley and Co-op Partners Warehouse took phased approaches to infrastructural expansion. Each produce operation was or is still reliant on a parent company to provide storage or manage logistics. Co-op Partners Warehouse also uses a third-party hauler for distribution outside the Twin Cities (Minneapolis and St. Paul, Minnesota), further reducing its in-house responsibilities. This combination of asset-based development (building out from existing strengths) and regional outsourcing significantly reduces infrastructure-related costs.

By contrast, the Growers Collaborative (previously a distributor operated by Community Alliance with Family Farms) invested in too much infrastructure early on and found itself facing mission drift as it attempted to simultaneously provide producer education and marketing *and* operate a distribution enterprise. It ultimately opted to reconfigure its supply chain and pull out of delivery so that it could focus on supporting its growers with training and marketing. These findings may be of value to economic development planners, who can work with transportation planners to develop economic incentives and partnerships that facilitate asset-based and phased development strategies that will be more effective in the current economic climate. Specifically, collaborative research and planning efforts between metropolitan planning organizations, regional freight coalitions, and academic bodies such as the Center for Freight Infrastructure Research and Education (CFIRE) may be an effective way to integrate existing expertise in

freight movement optimization with nascent efforts to build midtier food distribution networks.<sup>5</sup>

In summary, we urge planners, policy-makers, and allied professionals to advocate for and identify innovative funding strategies to help finance the expansion of physical aggregation and distribution infrastructure such as food hubs. At the same time, we caution entrepreneurs and technical assistance providers to pace physical infrastructural expansion appropriately so as not to overextend financially or programmatically. As the Baldwin case studies illustrate, there are multiple ways to configure supply chains. Aggregation can occur in a multiorganizational food hub and logistics can be outsourced until an organization has the resources to administer these activities in-house. With the right supply chain partners, a distributor may choose to never fully vertically integrate. Finally, we see a role for economic development and transportation planners in particular to improve coordination in regional planning and development. Their knowledge of freight and transportation networks, along with knowledge of creative public financing strategies, makes them uniquely equipped to foster context-sensitive approaches to community and regional food systems development, thus augmenting efforts by the private sector.

#### *Transparency and Source Identity*

All of the Baldwin case studies emphasized the importance of telling the story behind the product. For small growers accustomed to farm-direct sales, cultivating retail and institutional accounts and developing marketing and merchandising materials can feel foreign. Yet without this market savvy, local producers will likely find it difficult to compete in higher volume markets without significantly dropping their prices. Planners might assist producers new to retail and food service markets by

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<sup>5</sup> The Center for Freight Infrastructure Research and Education initiated its first research on local food transport with the University of Wisconsin-Madison Center for Integrated Agricultural Systems in 2010. The final report *Maximizing Freight Movements in Local Food Markets* is available at: [http://www.wistrans.org/cfire/documents/CFIRE\\_04-23\\_Final\\_Report.pdf](http://www.wistrans.org/cfire/documents/CFIRE_04-23_Final_Report.pdf)

partnering with or directing them to private and nonprofit local food marketing resources.

The Community Alliance with Family Farmers promotes product from different farmers under the *Buy Fresh Buy Local* banner and is developing educational materials about local products as well as marketing and merchandising strategies for every phase of the supply chain. The unified banner simplifies brand recognition for consumers, who are otherwise confronted with the names of many farms. Further, the brand elevates the visibility of a variety of products and producers from a given geographic area. Organic Valley's produce program capitalizes on the brand recognition developed by its well established dairy program. And Co-op Partners balances a variety of approaches ranging from co-branding its deli products with the National Cooperative Grocers Association to allowing farms to directly manage their sales and marketing to on-farm experiential education through the Gardens of Eagan Farm. Other Baldwin case study subjects use in-store product samplings and meet-the-farmer activities to help forge personal connections to reinforce farm and/or brand name.

As many planning subspecialties are similarly concerned with promoting the relationship between person and place, the integration of community and regional food production and consumption is a natural fit for new metropolitan plans, several of which explicitly seek to promote local sustainable food. The Chicago Metropolitan Agency for Planning (CMAP) recommends a three-pronged strategy in its "GO TO 2040" plan that calls for:

1. Facilitating sustainable, local food production and processing;
2. Increasing access to safe, fresh, nutritious, and affordable foods; and
3. Raising awareness [to help public officials, planners, and residents understand and support investments in sustainable local food] by providing data, research, training, and information.

Increasing the visibility of local food production and elevating access to healthy food to a metro-level priority will help raise the profile of the local food system in planning and policy efforts.

However, to advance the objectives detailed in the CMAP plan, resources and attention will also need to be devoted to the behind-the-scenes work of building relationships between producers, aggregators, and mid- and high-volume buyers. Planners can, and in some instances already are, serving the function of relationship brokers. The Institutional Food Market Coalition (IFM), a project of the Dane County (Wisconsin) Planning and Development Department, was launched in 2006 as a public-private partnership designed to develop institutional markets for local food. The IFM has worked closely with the Wisconsin Department of Agriculture, Trade and Consumer Protection and has successfully leveraged state and county funds to conduct outreach, education, and technical assistance, and to facilitate sales between Wisconsin producers, institutions, distributors, produce auctions, and local food businesses. In 2010 the IFM facilitated over \$2.5 million in sales of Wisconsin local food and helped create or retain 29 jobs (IFM, 2011).

#### *Fair Pricing*

While no two organizations examined in the Baldwin study employed the exact same pricing and payment strategies, certain themes did emerge across the case studies. Notably, prices were typically negotiated and were generally higher than terminal market prices. Further, to anticipate demand and increase negotiating power, several cases noted the importance of producer-to-producer and producer-buyer meetings to coordinate production planning and align supply and demand in advance of the growing season. This can be achieved informally by convening local producers who sell to the same accounts or more formally within a coordinated pool of producers. Higher levels of producer coordination seem to allow for more sophisticated pricing mechanisms, as is the case with the Organic Valley Produce Program described below.

The Organic Valley case study offers a compelling model of both fair pricing and collaborative producer-distributor partnerships. By offering its producers a base price along with an end-of-season “pooling bonus,” Organic Valley ensures that growers receive regular payments for their product. It also utilizes the pooling bonus mechanism as a way to build in flexibility to accommodate freight costs and some price fluctuation over the course of the season. What profits remain at the end of the season are then equitably redistributed. Organic Valley also illustrates the value of educating growers about the cost of production pricing and post-harvest handling. Taking a holistic approach to supply chain improvements, Organic Valley has made considerable investments in grower workshops and other resources to improve its growers’ capacity, its product quality, and the fairness of its pricing.

Co-op Partners Warehouse’s two-pronged distribution model raises another pricing issue for mid-tier value(s) chains: producers unfamiliar with high-volume markets are not always knowledgeable about pricing variability and mark-up practices. As a result, producers who sell product through Co-op Partners’ drop-ship program and under the Co-op Partners banner may sell the product at the same cost to each venue, making the retail price for a product sold through (and thus marked-up by Co-op Partners Warehouse) more expensive than the exact same item sold farm-direct. This can create tension between producers, Co-op Partners Warehouse, and their shared retail customers, but as the co-op’s director of business development noted, “Experienced growers usually avoid this issue and stabilize sales by charging different prices for direct sales and those made through a distribution.” Training for producers on wholesale pricing can also obviate these types of conflicts, and planners can foster education and technical training to advance mutually beneficial economic outcomes. Thus planners involved in rural development or working in coordination with cooperative extension may wish to coordinate cost-of-production and cost-of-distribution trainings in conjunction with agricultural economic development projects to help ensure that public investments in local proc-

essing and distribution are not stymied by assumptions about price points that fail to reflect the cost of production.

Planners are not typically engaged in helping establish product prices, but they do foster local and regional economies and so they need to understand how pricing mechanisms might influence their practices. Price negotiation is fundamental to fair pricing for producers and an important component of strategic supply chain relationships because it implies interdependency in supply chains. Buyers benefit from strong, mutually beneficial relationships with their producers because they contribute to improved product quality and consistency in supply. Producers benefit from increased market access, more loyal customers, and in some instances technical assistance. Planners can help establish collaborations that satisfy economic needs.

The creative organizational practices highlighted here show innovations in mid-tier food value(s) chains and how planners might foster the values and objectives driving the development of these chains as well as the innovative role these developments can play in creating resilient regional food systems. Further, the empirical examples serve to illustrate some of the ways social values can be built into the DNA of food distribution operations rather than functioning solely as ancillary or parallel objectives. Local and regional food systems are being reenergized by the diversity of expertise they are attracting, and they are fueling unprecedented collaboration between fields as distinct as urban and regional planning and nursing. Allied professionals from a wide range of professional backgrounds can assist entrepreneurs, growers, and other public and private partners to improve regional wholesale efficiencies, market access, farmer parity, and food security. The following section focuses on the following strategic interventions: infrastructure assessment and planning, regional economic development, and improved alignment of regulatory infrastructure.

### **Implications for Professional Planning**

This section steps back from the details of how organizations are reconstructing distribution systems into high volume, midtier food value(s) chains to elaborate recommendations for planners and other professionals interested in assisting organizations in meeting consumer demand and jurisdictions in meeting their goals for economic development (as initiated by community food assessments (Pothukuchi, 2004)). Here our goal is identifying the next steps policy professionals should take to facilitate the swift integration of food value(s) distribution systems into the everyday activities of economic development, land use, transportation, and other planning and policy fields. Doing so will multiply place-based food distribution networks able to balance the social and ecological benefits of the alternative food system with the economic and scalar efficiencies of the industrial food system. As this special issue and the authors share a professional and academic orientation in urban and regional planning, the following interventions emphasize the field of planning but are broadly applicable to allied professionals engaged in food systems development.

#### *Conduct Infrastructure Inventories*

The aggregation efforts of the food distribution businesses exemplified by the organizations discussed in this article illustrate two major lessons for professionals and other businesses: efficient aggregation is increasingly being orchestrated at multi-purpose (and sometimes multi-organizational) food hubs, and infrastructural investments are costly, which makes asset-based and phased development strategies particularly effective. To strategically advance asset-based food systems development, we must first have a working knowledge of regional food systems' present assets (such as existing processors, distributors, and transportation networks) and how those assets are interconnected. Regional food system inventories or asset-mapping (tailored predominantly to wholesale infrastructure and distribution) would significantly help with the practical work of rebuilding sustainable regional food systems and the physical infrastructure that supports them.

Planners are familiar with such efforts and use them in land use planning of various kinds. Such inventories are used in other professional fields as well. For example, the Land Trust Alliance (LTA), the national authority on land trust standards and practices, requires baseline documentation reports (BDRs) of all conservation properties prior to conservation transactions. BDRs document a property's conservation values and guide its management plan as stipulated by the LTA's code of ethical and technical guidelines (Land Trust Alliance, 2004). Likewise, energy audits, standard practice on the institutional scale as a precursor to energy efficiency facility upgrades, can identify the types of energy improvements that will yield the greatest return on investment. While distinct, these examples illustrate the broad range of application and referential weight given to inventories in fields utilizing baseline information to help preserve or improve upon the status quo.

Hundreds of community food assessments (CFAs) — participatory processes that systematically examine a broad range of community food issues and assets to inform change to make communities more food secure — have already been implemented at a variety of scales by planners and community food security advocates. While CFAs typically focus on issues of food quality and access, some have incorporated components that examine larger scale, infrastructural issues. Building on this precedent but with an eye toward regional and economic development, asset maps could detail a number of features: existing profit and nonprofit food distributors; food processors; the processing capacity of kitchen facilities at regional institutions such as churches and schools; freight transportation networks; temperature-controlled storage facilities; agricultural entrepreneurs, investors and loan guarantors; current and projected regional production capacity; cooperative extension resources; grocery and retail outlets; and other high-volume local markets including prisons, school systems, universities, nursing homes, and corporate campuses. A baseline regional food system inventory would achieve the following goals:

- Help identify gaps and patterns within the current landscape;
- Point to opportunities for partnerships;
- Lend legitimacy to project proposals and funding requests that seek to strengthen and scale up sustainable regional food systems;
- Serve as a yard stick against which to chart and assess future progress;
- Identify existing infrastructure, including distribution centers and storage facilities that could serve as food hubs; and
- Inform siting decisions about new processing and distribution facilities based on production areas and transport infrastructure.

The private planning firm Vandewalle & Associates of Madison, Wisconsin, funded by the Kellogg Foundation, has already begun working with colleagues at the Michael Fields Agricultural Institute, Blue Planet Partners, and University of Wisconsin–Madison to conduct a preliminary asset analysis of the Upper Midwest in conjunction with the Good to Grow Initiative (Vandewalle & Associates, 2007).

#### *Foster Regional Development of Allied Industries*

One systemic strategy for increasing transparency and maintaining information about source identity throughout a midtier food value(s) chain is to foster regional development of allied industries. The produce businesses discussed in this article primarily convey information about production practices and product origin through enhanced marketing and merchandising techniques. However, the development of “food clusters” could offer several advantages to local producers by helping to facilitate value(s) chain formation and place-based marketing. These benefits could range from strictly infrastructural and logistics improvements associated with strategically siting processing facilities near significant production areas to creating enhanced marketing opportunities resulting from the development of regional culinary identities. While the attraction and development of allied industries would advance rural development objectives through job creation, the cultivation of a

regional culinary identity could also promote food-related tourism opportunities.

Contemporary business literature substantiates these ideas by emphasizing the distinct advantages of increased innovation, workforce development, and competitive edge associated with industrial clusters (Porter, 1998; Saxenian, 1994). Most famously illustrated by the wine consortium in northern California, “clusters are geographic concentrations of interconnected companies and institutions in a particular field” (Porter, 1998, p. 8). Clusters encompass a variety of allied industries and related expertise and investment, such as suppliers of specialized inputs (e.g., machinery, services, and providers of specialized infrastructure), trade associations, universities, and government institutions, as well as financial institutions and investors (Porter, 1998).

By fostering connectivity through trade synergy and geographic proximity, clusters represent a means to achieve not only a competitive national and international advantage, but also regional economic development. Economic development specialists in particular can play an important role in developing those organizations, and when needed, reconciling these various private and public purposes in institutionalizing value chain characteristics into the relationships that constitute the clusters. Supporting independent businesses could simultaneously help fill gaps in regional food systems, build entrepreneurial capacity, and foster regional economic development.

One theme emerging from the Baldwin case studies is a need for greater investment in and development of midsize processing infrastructure. Vegetable processors, once prolific across portions of the Midwest, have declined over the past three decades, paralleling the consolidation of the industrial food system (Hinrichs & Lyson, 2007). Likewise, many food service providers at institutions (hospitals, schools, universities, and prisons) interested in sourcing locally have lost their capacity to prepare fresh product. As a result, without sufficient, affordable processing infrastructure, growers and local food distributors are losing a significant

portion of their potential market, and palatable food is going to waste. All three businesses highlighted here cited the need for processing to add value, to incorporate blemished products into the value stream, and to increase access to institutional and retail markets that prefer to purchase processed products over whole products.

Lastly, the success of the wine consortium in Northern California is not only a function of the geographic proximity and high levels of exchange between suppliers, manufacturers, trade associations and supportive research and funding entities; it is also a result of the fact that wine consumers both inside and outside the region began to conceive of Northern California as a premier wine grape-growing region. Similar efforts are underway in the Driftless Region (see figure 3), a geologically defined 24,000-square mile area situated along the upper Mississippi River Valley of Minnesota, Wisconsin, Iowa, and northwestern Illinois. In 2009, the region became formally recognized as the Upper Mississippi River American Viticultural Area. Also home to the largest number of raw milk cheeses and organic and CSA farms in Wisconsin, the Driftless Region is making a name for itself in the Upper Midwest and beyond. Perhaps it's not an accident that both Organic Valley and Co-op Partners Warehouse are located in or adjacent to the Driftless Region.

Strategic development of cognate industries, such as processing, would support regional wholesale food distribution, thus advancing the following goals:

- To deliver more local product to larger volume regional markets;
- To enhance access to fresh and fresh-frozen local product for consumers in institutions such as schools and hospitals;
- To reduce food miles traveled by food consumed in the region;
- To retain more food dollars in regional economy;

- To foster community economic development, which as distinct from “economic growth” is characteristically long-term, purposeful, and permanent and increases communities’ capacity to act and innovate (Shaffer, Deller, & Marcouiller, 2006); and
- To enhance opportunities for place-based marketing through cultivation of regional culinary identities.

Professionals active in local and regional food system development should recognize that significant philanthropic and federal grant opportunities exist to establish new organizations and collaborations for existing organizations. Regional planners, public-sector staff, and consultants can help ensure successful applications by assisting organizations and alliances in integrating various elements of the food system appropriately when responding to various request-for-proposal guidelines and by supporting related research assessing these various initiatives.

#### *Realigning Regulatory Policy with Small- to Midscale Production and Distribution*

The food regulatory system is largely designed to ensure food and workplace safety by standardizing and monitoring the industrial food system. As a result, current regulations present numerous challenges to small- and midscale growers and distributors whose production scale and distribution range are often incongruent with the particular regulatory costs and procedures associated with their trades. Additionally, as the price for a product frequently subsidizes or internalizes costs associated with regulation, incongruent regulations pose a challenge to small- and midscale producers in setting prices. While clusters or similar initiatives can facilitate fair pricing, such prices will also likely require complementary policy work to address scalar incompatibilities between these midtier efforts and the current regulatory structure.

Following the recent series of food recalls across the country, trade associations and consumer advocates alike have become increasingly vocal about the need for food safety reform (Harris &

**Figure 3. The Driftless Area of the Upper Mississippi River Valley**

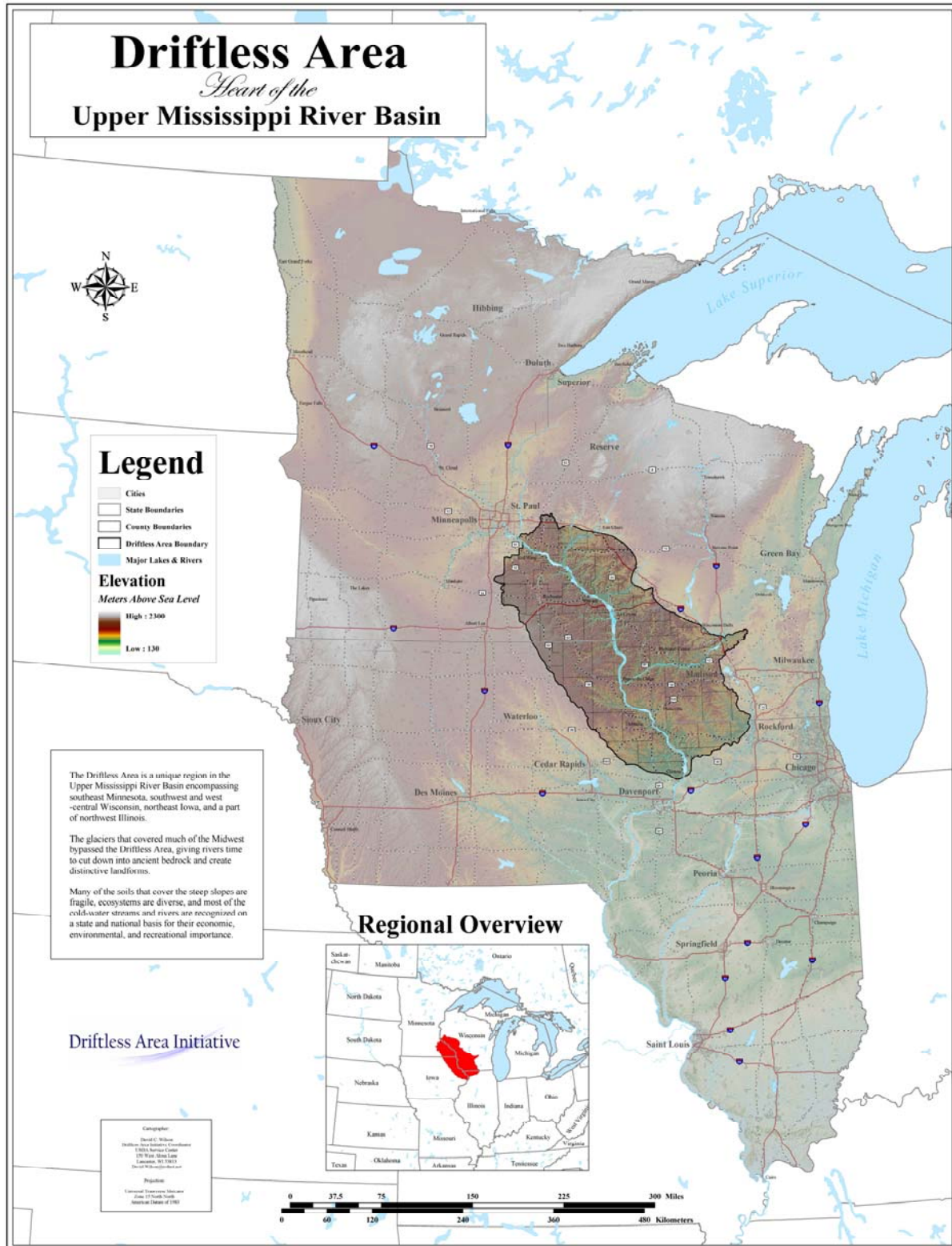


Image courtesy of the Driftless Area Initiative.

Belluck, 2009). However, research indicates that regulations poorly tailored to small- and midscale enterprises are both inconsistently enforced and often inadequately implemented (Yapp & Fairman, 2006). By partnering with state departments of agriculture, trade, and public health, cooperative extension, consumer watchdog groups, trade associations, nonprofits and policy-makers at the county, state, and federal levels, professionals supporting the development of local and regional food systems could help facilitate the formation of a regulatory framework that would achieve the following:

- Increase food safety and consumer trust in the regulatory system;
- Enhance interstate regional trade opportunities by fostering reciprocity agreements through which production and processing standards are streamlined or equivalencies are formally recognized as is the trend within some international food trade networks (Woolthuis, Lakhuis, & Gilsing, 2005);
- Leverage county, state, and federal economic development grants to help growers and processors cover the infrastructure costs associated with GAP certification, the development of Hazard Analysis & Critical Control Points (HACCP) plans, and mandated facility upgrades;
- Improve accessibility, clarity, and consistency of regulatory policy for emergent farmers and local food entrepreneurs and distributors through resources such as toolkits tailored to the distinct phases of a variety of regional wholesale supply chains;
- Improve small- and midscale food enterprises' regulatory compliance; and
- Invest in site planning, design, and other assistance to facilitate food distribution.

In short, government has an important role to play in developing a level regulatory and infrastructural playing field for midtier distribution. Such efforts

will facilitate the development and growth of new enterprises with their associated economic and social benefits. Finally, the foregoing recommendations associated with inventories and assessments, economic development and organizational design, and regulatory frameworks, can all be implemented by multidisciplinary planning offices, both public and private. Clearly planners have much to offer in this important element of food system practice. We feel that advocates and allied professionals are also central to advancing these steps.

### Conclusions

Despite the relative absence of wholesale distribution in much of the planning profession's academic and grey literature, emerging models promise to remake the relationship between producers and their regional markets. In this article, key lessons from the value(s) chain literature were illustrated with examples from comparative case studies conducted by the University of Wisconsin–Madison Center for Integrated Agricultural System to acquaint professional planners and allied professionals with strategies for imbuing mid- to high-volume local food distribution with normative values such as transparency and fairness. The research presented here is not a comprehensive analysis of regional wholesale food distribution. Rather, we have focused on organizational, logistical, and marketing characteristics of local and regional food value(s) chains.

Strategic planning and collaborative trans-sectoral solutions will be necessary to ensure that as regional food systems expand, they retain the goals and values outlined in the *Principles of a Healthy Sustainable Food System*. The opportunities for public health professionals, rural development specialists, urban and regional planners, policy-makers and others to advance these objectives are numerous. Here we highlighted interventions particularly well suited to planning professionals. We first built on University of Wisconsin–Madison CIAS case studies to identify how planners could augment aggregation, marketing, and fair price negotiations to foster the development of midtier food value(s) chains. We then described larger system interven-



tions that regional planners could employ to better accommodate midtier food distribution needs in the regional planning and food regulatory environment: documentation of existing wholesale food system infrastructure; incorporation of agricultural industry clusters into regional economic and community development planning and the cultivation of regional culinary identities; and lastly, the development of partnerships with policymakers and food safety regulators through zoning and regulatory policy to foster regulation that both protects public safety and welfare while also building the capacity and market access of local food entrepreneurs.

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### References

American Dietetic Association, American Nurses Association, American Planning Association, and American Public Health Association. (2010, June). *Principles of a healthy, sustainable food system*. Retrieved from [http://www.planning.org/national\\_centers/health/pdf/HealthySustainableFoodSystemsPrinciples.pdf](http://www.planning.org/national_centers/health/pdf/HealthySustainableFoodSystemsPrinciples.pdf)

American Planning Association. (2007). *Policy guide on community and regional food planning*. Retrieved from <http://www.planning.org/policy/guides/adopted/food.htm>

Barham, J. (2008). *Assessing alternative food distribution models*. PowerPoint presentation. USDA Marketing Services Division.

Day-Farnsworth, L., McCown, B., Miller, M., & Pfeiffer, A. (2009). *Scaling up: Meeting the demand for local*. University of Wisconsin Cooperative Extension, Center for Integrated Agricultural Systems.

Day-Farnsworth, L., Bruner Zimmerman, A., & Daniel, J. (Forthcoming). Proceedings from *Making Good Food Work Conference*.

Dreier, S., & Taheri, M. (2008). *Innovative models: Small grower and retailer collaborations* (Good Natured Family Farms and Balls Food Stores). Wallace Center at Winrock International.

Grubinger, V. (2010). *Ten reasons to buy local food*. University of Vermont Extension. Retrieved from <http://www.uvm.edu/vtvegandberry/factsheets/buylocal.html>

Harris, G., & Belluck, P. (2009, January 29). New look at food safety after peanut tainting. *New York Times*.

Hartman Group. (2008). *Consumer pulse: Consumer understanding of buying local*. The Hartman Group.

Hinrichs, C., & Lyson, T. (2007) *Remaking the North American food system: Strategies for sustainability*. Lincoln: University of Nebraska Press.

Institutional Food Market Coalition (IFM). (2011, March). *Dane County Institutional Food Market Coalition 2010 program report*. Dane County Planning & Development Department. Retrieved from <http://lgc.uwex.edu/Downtowns/DOC/Apr11/IFM%202010%20Prog%20Rep%20FINAL%20FOUND-READINGS.pdf>

Land Trust Alliance. (2004). *Land Trust Standards and Practices*. "Standard 11: Conservation Easement Stewardship." Retrieved from <http://www.landtrustalliance.org/training/sp/lt-standards-practices07.pdf>

Lev, L., & Stevenson, G. W. (2011). Acting collectively to develop midscale food value chains. *Journal of Agriculture, Food Systems, and Community Development*, 1(4), 119–128.

Maye, D., Holloway, L., & Kneafsey, M. (Eds.). (2007). *Alternative food geographies: representation and practice*. Oxford: Emerald Group Pub Ltd.

Morales, A. (Forthcoming). Growing food AND justice: Dismantling racism through sustainable food systems. In A. Alkon & J. Agyeman (Eds.). *Cultivating food justice: Race, class and sustainability*. Cambridge, Massachusetts: MIT University Press.

- Porter, M. E. (1998). Clusters and the new economics of competition. *Harvard Business Review*, 76(6), 77–90.
- Pothukuchi, K. (2004). Community food assessment: A first step in planning for community food security. *Journal of Planning Education and Research*, 23(4), 356–377.
- Pothukuchi, K., & Kaufman, J. (2000). The food system: A stranger to the planning field. *Journal of the American Planning Association*, 66(2), 113–124.
- Randol, J. (2011, July 21). *Farm Fresh Food Hub Services, St. Louis, Missouri. Clearing the roadblocks: Market-based strategies for getting good food to all communities* [National Good Food Network webinar]. The Wallace Center at Winrock International.
- Saxenian, A. (1994). *Regional advantage: Culture and competition in Silicon Valley and Route 128*. Cambridge, Massachusetts: Harvard University Press.
- Shaffer, R., Deller, S., & Marcouiller, D. (2006). Rethinking community economic development. *Economic Development Quarterly*, 20(1), 59–74.
- Starr, A., Card, A., Benepe, C., Auld, G., Lamm, D., Smith, K., & Wilken, K. (2003). Sustaining local agriculture: Barriers and opportunities to direct marketing between farms and restaurants in Colorado. *Agriculture and Human Values*, 20(3), 301–321.
- Stevenson, G. W., Clancy, K., King, R., Lev, L., Ostrom, M., & Smith, S. (2011). Midscale food value chains: An introduction. *Journal of Agriculture, Food Systems, and Community Development*, 1(4), 27–34.
- Stevenson, S. (2009). *Values-based food supply chains: Executive summary*. University of Wisconsin Center for Integrated Agricultural Systems. Retrieved from <http://www.cias.wisc.edu/wp-content/uploads/2009/07/vcexecsum.pdf>
- Stevenson, S., & Pirog, R. (n.d.). *Value-based food supply chains: Strategies for agri-food enterprises-of-the-middle*. Ag of the Middle white paper. Retrieved from <http://www.agofthemiddle.org/papers/valuechain.pdf>
- Stevenson, S., & Pirog, R. (n.d.). *Why worry about the agriculture of the middle?* Ag of the Middle white paper. Retrieved from <http://www.agofthemiddle.org/papers/whitepaper2.pdf>
- U.S. Department of Agriculture (USDA). (2009). *Emerging market opportunities for small-scale producers: Proceedings of a special session at the 2008 USDA Partners Meeting*. USDA Agricultural Marketing Service, Marketing Services Program. Retrieved from <http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STEL.PRDC5076556&acct=wdmgeninfo>
- U.S. Department of Agriculture (USDA). (2009, April). *Agriculture Deputy Secretary Merrigan highlights the 'Know Your Farmer, Know Your Food' initiative in Chicago*. (News Release No. 0122.10). Washington D.C.: USDA. Retrieved from <http://www.usda.gov/wps/portal/usdahome?contentidonly=true&contentid=2010/03/0122.xml>
- U.S. Department of Agriculture (USDA), Cooperative State Research, Education, and Extension Services (CSREES). (2008, November). *Local Food Systems. Family Farm Forum* [webinar]. Retrieved from <http://connect.extension.iastate.edu/p59924434/>
- Vandewalle & Associates. (2007). *Good to grow – Regional food strategy*. Retrieved from <http://www.vandewalle.com>
- Winrock International Wallace Center. (2009, August 23). *Success for family farms project. National Good Food Network Cluster Call* [webinar]. Retrieved from <http://www.vimeo.com/5957772>
- Wisconsin Department of Commerce. (2010, September 30). *Governor Doyle announces EDA funding for Food Enterprise Center in city of Viroqua* [press release]. Retrieved from <http://www.commerce.state.wi.us/NEWS/releases/2010/141.html>
- Woolthuis, R. K., Lakhnuijzen, M., & Gilsing, V. (2005). A system failure framework for innovation policy design. *Technovation*, 25, 609–619.
- Yapp, C., & Fairman, R. (2006). Factors affecting food safety compliance within small and medium-sized enterprises: Implications for regulatory and enforcement strategies. *Food Control*, 17, 42–51.
- Zajfen, V. (2008). *Fresh fruit and vegetable distribution models for the greater Los Angeles area*. Center for Food and Justice. Retrieved from [http://blogsangeles.typepad.com/blogs\\_angeles/2008/06/report-on-explo.html](http://blogsangeles.typepad.com/blogs_angeles/2008/06/report-on-explo.html)

## Appendix. Overview of Case Study Organizations

Enterprise	<b>Growers Collaborative (CAFF)</b> <b>Davis, California</b> <b>Nonprofit</b>	<b>Co-op Partners Warehouse</b> <b>St. Paul, Minnesota</b> <b>Subsidiary of a natural foods co-op</b>	<b>Organic Valley Produce Program</b> <b>La Farge, Wisconsin</b> <b>Producers co-op</b>
<b>Overview</b>	<p>Initially a program of the sustainable agriculture nonprofit Community Alliance with Family Farms (CAFF), Growers Collaborative was launched in 2003 to connect new, small and minority farms with regional institutions seeking local product. Towards this end, the organization made costly grant-funded investments in delivery vehicles and storage warehouses. Realizing that broadline distributors dominated the regional institutional food service market and that many institutions lacked the capacity to process fresh product, Growers Collaborative determined that it was unlikely to capture a profitable percentage of the market and opted to reevaluate its business plan and organization. By August 2010, CAFF had shifted its focuses to (1) providing technical assistance for producers, and (2) providing education, marketing, and branding under the Buy Fresh Buy Local banner for produce buyers and household consumers. As part of this transformation, it transferred its produce handling and logistics activities to two locally based private wholesale companies.</p>	<p>Co-op Partners Warehouse is a certified organic distributor that sells produce and a variety of perishable and shelf-stable products. Established in 1999 as a subsidiary of The Wedge Natural Foods Co-op, Co-op Partners Warehouse was formed in response to the demand for greater representation of small and local producers in the regional wholesale produce markets. It helped fill the void left by the decline of other regional cooperative distributors, and now serves retail co-ops and natural food stores throughout the Upper Midwest, as well as some restaurant and institutional accounts. Co-op Partners Warehouse owns and operates a 45,000 square foot (4,180 square meter) warehouse in St. Paul. It has its own small fleet for local deliveries, but distribution within the larger five-state region (Illinois, Iowa, Minnesota, North Dakota, and Wisconsin) is achieved through a partnership with Edina Couriers, an independent hauling service. Co-op Partners Warehouse assesses producers a small delivery fee for its hauling services, but customers order from and are billed by the producer. In recent years, it has expanded to include a line of deli products and purchased the Gardens of Eagan, an organic farm and long-time vegetable supplier to The Wedge Co-op.</p>	<p>Organic Valley is a producer-owned cooperative that sells organic dairy and soy products, meat, eggs, and produce. Founded in 1988 as a produce growers' cooperative, Organic Valley's dairy program quickly became its primary and most profitable focus. However, growing demand for local produce has recently bolstered Organic Valley's Produce Program. The co-op sources most of its produce from Amish growers in southwestern Wisconsin and supplies supermarkets and distribution centers in the Midwest, East and South. Organic Valley's Produce Program encompasses production, warehousing and sales. A produce pool coordinator works with growers to coordinate preseason planning. The coordinator also visits each farm to review quality standards and packing requirements and to address production questions. Organic Valley provides workshops for its growers on a range of topics, including on-farm sanitation, post-harvest handling, and pest management. It also supplies its growers with product liability insurance and is providing additional guidance as they move toward receiving the USDA's Good Agricultural Practices (GAP) certification. Organic Valley helps growers meet wholesale produce industry requirements that would be difficult and expensive to meet individually.</p>

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<b>Aggregation</b>	<p>In the current model, CAFF creates and expands market opportunities for local farmers by providing resources to familiarize growers with standards associated with institutional markets and technical assistance for institutional food service to bring local produce onto the menu. It has also conducted a local food market analysis and feasibility study for an Aggregation &amp; Marketing Center on California's North coast. Though it no longer serves an immediate aggregation and hauling function, CAFF infuses values into existing aggregation and distribution activities by building market access and capacity, and by enhancing the visibility of sustainable and family farmers.</p>	<p>Co-op Partners Warehouse offers two distribution services to its local food suppliers. Its drop-ship service enables buyers to place orders directly with local suppliers. In this program, Co-op Partners Warehouse provides a hauling function; the product transported is never part of Co-op Partners' inventory, and producers and buyers independently negotiate billing and invoicing. The drop-ship program reduces the need for local suppliers to each deliver separately to the same retail accounts. Co-op Partners serves a minimal aggregation role in this capacity. Co-op Partners Warehouse also operates a more traditional distribution operation in which it purchases product from suppliers, aggregates it at a central warehouse, and manages its own retail customer accounts. By providing both aggregation and hauling functions, Co-op Partners Warehouse meets the unique needs of its various supply chain partners while helping to increase the overall availability of local products in the marketplace.</p>	<p>Growers wash, grade, and pack their produce on-farm and then either deliver it to the Organic Valley distribution facility or have it picked up for a small fee. Because it works largely with Amish growers who have limited cold storage and transportation options, Organic Valley has found it necessary to pick up perishable product shortly after it is harvested and select crops that require less stringent temperature control. As a result, the co-op plans to develop a centralized grading and packing facility with forced air and hydrocooling to improve product grading, increase pack-size options, and extend the shelf life of its products. Organic Valley also has a freight logistics operation, Organic Logistics, which coordinates its regional and national hauling.</p>
<b>Transparency and Source Identity</b>	<p>CAFF's marketing and branding campaigns and educational programs work to increase consumer demand for and access to fresh, local produce by connecting household consumers and retail and institutional buyers with information about local producers and seasonably available products. CAFF has developed a variety of marketing, merchandising, and advertising materials for California producers and retailers under the Buy Fresh Buy Local brand name. CAFF has developed a variety of marketing, merchandising, and advertising materials for California producers and retailers under the Buy Fresh Buy Local brand name. CAFF's producer members are listed on the Buy Fresh Buy Local website and included in the Buy Fresh Buy Local Eater's Guide.</p>	<p>The degree to which information about product origin is retained to point of sale varies from supplier to supplier, but there are several actions that Co-op Partners Warehouse takes to increase the visibility of its suppliers and enhance producer-consumer relationships. They include an online list of producer profiles on the Co-op Partners Warehouse website; a drop-ship program which shortens food supply chains, thereby creating opportunities for producers and buyers to communicate directly about production practices and product origin; and finally, The Wedge Community Co-op's 2007 acquisition of the Gardens of Eagan Farm (an organic vegetable farm located outside Minneapolis/St. Paul), which has created additional learning opportunities for consumers through its 501(c)(3) nonprofit, The Organic Field School.</p>	<p>Organic Valley produce is sold under the Organic Valley label. Individual farms are not identified, but the state of origin is coded on each case and Organic Valley is pursuing the placement of Global Trade Item Number (GTIN) bar codes on all of its cases. Organic Valley also regularly provides its buyers with sales sheets and point-of-sale merchandising materials.</p>

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**Pricing**

Under CAFF management, Growers Collaborative farmers set their own prices and buyers meet them without resistance. As a representative from CAFF explained, the premium a buyer pays for local food is typically minimal relative to the marketing opportunities they gain by being able to advertise to their customers that they source locally.

Co-op Partners negotiates prices directly with local growers. Its markup ranges from 16% to 25%, depending on product perishability. Prices are set in advance or determined as needed.

Organic Valley's growers are paid a base price biweekly based on the products and volume they supply. Growers also receive a "pooling bonus" at the end of the season — the difference between the revenues and base price of each crop minus freight and commission costs. Organic Valley sees room for improvement in identifying the cost of production of each of its produce products. It has found that many of its growers have insufficient knowledge of their input and labor costs; if it could obtain this data, Organic Valley would be more able to advocate for sustainable price returns and cut production of unprofitable crops. To help bridge this knowledge gap, Organic Valley offers cost-of-production workshops and workbooks for its growers.

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## The Community Food Centre: Creating space for a just, sustainable, and healthy food system

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### Abstract

Alternative food initiatives have been challenged by critics to address the long-term, structural challenges confronting the food system in an integrated and comprehensive way. Confronting these

challenges requires dynamic, multilevel and multi-sectoral strategies that integrate antipoverty efforts, ecological sustainability, food, wellness and community building throughout all aspects of the food system. Moving initiatives beyond the margins can begin by identifying and building on the successes of existing projects. In this pursuit, this paper articulates the case of *The Stop Community Food Centre* as it has evolved from a food bank offering emergency relief into a thriving neighborhood hub where people come together to grow, cook, and share food, and where people advocate for measures to establish a more just, sustainable, and healthy food system for all.

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### Keywords

antipoverty, community building, Community Food Centre, ecological sustainability, food and wellness, food bank, service hub, The Stop

### Introduction

An increasing interest in food issues is evident from the expanding number and scope of

individuals and organizations involved in food initiatives across North America (see for example Allen, 2004; Allen, Goodman, FitzSimmons, & Warner, 2003; Canadian Cooperative Association [CCA], 2009; Elton, 2010; Katz, 2006; Kirbyson, 2005; Koc, MacRae, Mougeot, & Welsh, 1999; Winne, 2010). These initiatives, while all involving food, are driven by a range of different goals, including social justice, ecological sustainability, health, and democratic decision-making. Critics have argued that many existing food-related initiatives tend toward a theoretical and practical separation of these goals (e.g., only ecological sustainability or only social justice) (Allen 2010; Allen, FitzSimmons, Goodman, & Warner, 2003; Power, 1999). This is thought to limit the potential of this work to move beyond the margins of society and address long-term, structural challenges within the food system in an integrated and comprehensive way (Allen, 2004; Buttel, 1997; Johnston & Baker, 2003).

Moving initiatives beyond the margins can begin with identifying and building on the successes of existing projects through sharing strategies (Diani & Bison, 2004; Uvin & Miller, 1996). This paper presents a case study of *The Stop Community Food Centre (The Stop CFC)*, a nonprofit organization in Toronto, Canada, working to develop a comprehensive approach to addressing multiple challenges within the food system. A Community Food Centre (CFC) can be described as a neighborhood-based, physical space that uses food as an entry point to promote the physical and emotional health of individuals and communities, and to develop community-based and state-level strategies to address challenges within the food system.

Following a brief account of our methods, the paper describes the evolution of *The Stop CFC* from a traditional food bank to a multiservice CFC. It documents how particular social and environmental goals — namely antipoverty, ecological sustainability, health and wellness, and community-building — are incorporated into *The Stop CFC*'s programming. The next section explores the particularly compelling aspects of the CFC approach, including its attempts to build social

infrastructure by providing space for food-related activities and organizing, subsidizing a more equitable and sustainable food distribution system, developing a values-based practice, and directly engaging people in broader social, political, and ecological issues. The final section addresses some of the challenges and tensions faced by *The Stop CFC*. The paper concludes with a reflection on how the innovations and experiences of *The Stop CFC* can inform the broader food movement as it works towards a more sustainable, just, healthy, and democratic food system for all.

### Methods

To document the evolution of *The Stop CFC*, an archival analysis of organizational materials was conducted. Materials reviewed included an annual survey of program participants, newsletters, websites, annual reports, and program evaluations. These materials were used to document the history of *The Stop CFC*, to identify the range of activities and programs undertaken by *The Stop CFC*, and to provide a sense of the scale and scope of each program.

This data was supplemented by informal interviews conducted by the principal author with senior level staff. These interviews were intended to enrich, clarify, and confirm the information drawn from the document analysis, rather than to draw out individual experiences with *The Stop CFC*.

These data were contextualized by the principal author's personal experience with the organization as a volunteer, staff member, and consultant between 2003 and 2010. While data is not presented explicitly from these experiences, the analysis and interpretation of the results are grounded in this extended period of engagement with the organization. As such, the paper is not intended as an solely as an "objective" or external assessment of *The Stop CFC*'s work; rather, the paper provides an overview of *The Stop CFC* and its work as seen by those who are intimately involved with it. At the same time, *The Stop CFC* is presented here not as a perfect case, but as a work in progress and as part of a broader food movement working toward a more sustainable food system for all.



## The Evolution and Current Activities of *The Stop Community Food Centre*

In the late 1970s, St. Stephen-in-the-Fields, a church in Toronto's downtown core, established a small food distribution project for those most affected by the growing recession in Canada. The initiative was developed in direct response to neighborhood residents living on low incomes who came knocking on the church's door, hungry and in increasing need (Russell, 2002). As that need increased, the emergency service operation quickly outgrew its original space, moved to a larger location, and incorporated as one of Canada's first food banks. Over time, the organization's leadership began to recognize the ineffectiveness of its short-term, charity-based solutions (Saul, 2002). The organization therefore began to incorporate political and social initiatives (for example, assisting people with landlord-tenant disputes, social services, and employment support) in addition to its emergency food program (Levkoe, 2004).

In 2001, the organization took the name *The Stop Community Food Centre* and moved to the Davenport West neighborhood (Saul, 2002), a community identified by Statistics Canada as one of the region's most diverse, but one with above-average rates of unemployment and low income (City of Toronto, 2006). *The Stop CFC's* food bank and drop-in meal programs adopted an emphasis on healthy food as a way to build morale and promote mental and physical health (The Stop, n.d. a). In 1998, the development of an urban agriculture program directly engaged *The Stop CFC* in issues of agroecological food production (Levkoe, 2006). Staff also began to recognize the impacts of building social ties and mutual support networks within communities. As resources increased, *The Stop CFC* was able to invest in a civic engagement process that supported community members in understanding and addressing root causes of poverty and food security (Levkoe, 2006).

Today, *The Stop CFC* maintains its emergency food programs in the form of a food bank and a drop-in food program, but has complemented these with a range of capacity-building, educational, and skills-

training programs that include community kitchens, community gardens, and educational workshops that emphasize food-related skills and the reduction of social isolation, as well as civic engagement programs that involve program users in advocacy and community development initiatives (see table 1 on the following pages). In 2009, *The Stop CFC* launched the *Green Barn* (see figure 1) as a satellite sustainable food production and education center in partnership with Artscape, a local organization that specializes in the rehabilitation of underused buildings into community arts and culture venues. The *Green Barn* includes a state-of-the-art greenhouse, commercial kitchen, demonstration gardens, and classroom (Artscape, n.d.). In 2009, *The Stop CFC* had an operating budget of over CA\$2.8 million, the vast majority of which came from private donations (The Stop, 2009).

**Figure 1: The Stop CFC Green Barn**



(Photo credit: Charles Z. Levkoe)

The following sections provide an overview of *The Stop CFC's* programming and activities, organized in relation to antipoverty, ecological sustainability, health and wellness, and community-building goals. The programs and their relationship to these goals are summarized in table 1, *The Stop CFC* program chart.

### *Antipoverty Work*

*The Stop CFC* is rooted in low-income and immigrant communities, which have typically been left out of the food movement (Slocum, 2006). Most

**Table 1. The Stop CFC Program Chart**

Program*	Description*	Numbers (2010)**	Antipoverty Efforts	Ecological Sustainability	Food and Wellness	Community Building
<b>Food Bank and Drop-in Meal Program</b>	Access to a three-day supply of food once a month	13,038 food hampers distributed; 52,875 meals served	Meets immediate food needs; offers dignified environment; access to information on social issues, housing, health care, and welfare	Availability of sustainable, local food	Availability of high quality, fresh food; fosters social connections	Engages broad allies; raises public awareness
<b>Community Kitchens</b>	Participants cook and eat together, learn and share new skills	249 community kitchen sessions	Meets immediate food needs; offers dignified environment	Availability of sustainable, local food	Availability of high quality, fresh food; fosters social connections	Builds knowledge and skills; fosters meaningful social relationships
<b>Healthy Beginnings and Family Support</b>	Pre- and post-natal nutrition and support program for women living on low incomes	261 women took part, for a total of 2,464 visits	Meets immediate food needs; access to information on social issues, housing, health care, and welfare	Availability of sustainable, local food	Offers breast-feeding support; availability of high quality, fresh food; fosters social connections	Builds knowledge and skills; fosters meaningful social relationships
<b>Community Action</b>	Support and training to speak out about and work together on issues of poverty, hunger and inadequate income	15,000 people completed the Do the Math online interactive tool; 1,000 attended film nights, antipoverty rallies and Put Food in the Budget events; 1,623 visits to the community advocacy office for referrals	Promotes activism and advocacy on poverty issues		Fosters social connections	Builds knowledge and skills; fosters meaningful social relationships; engages broad allies; raises public awareness

*continued*

<b>Program*</b>	<b>Description*</b>	<b>Numbers (2010)**</b>	<b>Antipoverty Efforts</b>	<b>Ecological Sustainability</b>	<b>Food and Wellness</b>	<b>Community Building</b>
<b>Urban Agriculture (greenhouse, community gardens, Yes In My Backyard, Global Roots Garden, compost systems)</b>	Multiple collectively managed vegetable and herb gardens along with a garden share program produce vegetables for volunteers, the drop-in meals and other programs	4,000 lbs. (1,800 kg) of produce harvested annually; 249 sessions for adults in the garden and greenhouse; 38,976 lbs. (17,679 kg) of waste composted at the Green Barn	Meets immediate food needs	Availability of sustainable, local food; production using agro-ecological methods; demonstrates environmental design; waste diversion	Availability of high quality, fresh food; fosters social connections; promotes physical activity	Builds knowledge and skills; fosters meaningful social relationships; engages broad allies; raises public awareness
<b>Bake Oven and Markets (Good Food Market, farmers' market)</b>	A weekly affordable fresh food market, seasonal weekly pizza-baking sessions at an outdoor wood-fired bake oven, and a year-round farmers' market	39 farmers sold approximately CA\$1 million at the farmers' market; 600 people shop at the farmers' market, and between 50 and 80 shop at the Good Food Market weekly	Meets immediate food needs; offers dignified environment; provides income for farmers	Availability of sustainable, local food	Availability of high quality, fresh food; fosters social connections	Fosters meaningful social relationships; engages broad allies; raises public awareness
<b>Sustainable Food Systems Education</b>	Workshops for students focused on food issues that support the Ontario curriculum, and an after-school program for lower-income kids providing hands-on activities in the kitchen, garden, and greenhouse	365 grade 5 children spent 4,600 hours studying food and environmental sustainability, social justice, health and diversity at the Green Barn	Meets immediate food needs; promotes activism and advocacy on poverty issues	Availability of sustainable, local food; production using agro-ecological methods	Availability of high quality, fresh food; fosters social connections	Builds knowledge and skills; fosters meaningful social relationships; raises public awareness
<b>Social Enterprise</b>	<i>The Stop CFC's</i> in-house chefs host a variety of initiatives aimed at raising funds for front-line programs including catering services, cooking classes, dinners		Promotes activism and advocacy on poverty issues	Availability of sustainable, local food	Availability of high quality, fresh food	Engages broad allies; raises public awareness

\* The Stop, n.d. b

\*\* The Stop, 2010; and Scharf et al., 2010

people come to *The Stop CFC* because of the emergency services it offers — specifically, the food bank and the drop-in meal program (The Stop, 2010). While demand for these services has increased as a result of the latest economic downturn (Food Banks Canada, 2010), there has been significant criticism of emergency food programs. Food bank recipients report that these kinds of charity-based responses strip them of their dignity and do little to solve longer-term challenges (Hobbs, MacEachern, McIvor, & Turner, 1993). Indeed, by providing a partial and short-term “solution” to the problem of hunger, some have argued that charitable emergency food programs prevent more fundamental systemic change (Allen, 1999; Poppendieck, 1998; Tarasuk & Eakin, 2003).

While aware of these critiques, *The Stop CFC* continues to provide emergency food. Staff reported in interviews that they see this as justified and necessary given the demand for the programs and the absence of alternatives at the present time. However, *The Stop CFC* has attempted to respond to these concerns in a variety of ways. The aspects of emergency food programs that are considered by clients to be most degrading — such as long line-ups, intrusive means testing, and lack of choice in food (Poppendieck, 1998) — have been eliminated. Instead, neighborhood residents using *The Stop CFC*'s emergency services have access to renovated, comfortable waiting spaces, community information, beverages, and prepared foods. Further, staff reported in interviews that food bank users are not required to disclose personal information in order to participate and are able to select some specific items to include in their food hamper. Importantly, *The Stop CFC* has initiated two key advocacy efforts to increase incomes so that everyone can afford to buy healthy and sustainably produced food: “Do the Math” and “Put Food in the Budget” (eventually adopted by the Social Planning Network of Ontario) (Do the Math, n.d.; Put Food in the Budget [PFB], n.d.; Scharf, Levkoe, & Saul, 2010). Both are intended to push for social assistance that ties welfare rates to an estimate of what it actually costs to live in Ontario. *The Stop CFC* is therefore not only distributing emergency food, but also struggling to

publicize the links between growing poverty and insufficient access to acceptable food, and to push for policy-level solutions (Saul, 2010). In addition, while *The Stop CFC*'s food bank and meal programs are primarily vehicles to distribute emergency food, they can serve as an entry point for neighborhood residents, who come to *The Stop CFC* initially for emergency food but subsequently become connected to other programming.

#### *Building Ecological Sustainability*

Ecological sustainability was distant from *The Stop CFC*'s original mandate, but over time it became increasingly difficult to ignore the environmental issues that arise in work around food (Levkoe, 2006). Today, *The Stop CFC*'s community gardens (see figure 2) produce over 4,000 lbs. (1,800 kg) annually of fresh, organic produce, which is divided between programs and garden volunteers (The Stop, n.d. c). The backyard-sharing program “Yes in My Backyard (YIMBY)” connects city dwellers who have land to share with low-income people who want to garden but don't have access to space for growing food (see table 1). YIMBY offers workshops, tool sharing, and other opportunities for neighborhood residents to collaborate (The Stop, n.d. c). Both the community gardening and YIMBY programs are attempts to take advantage of available land and the investment of individual labor to make ecologically produced food available in the neighborhood to those who would have trouble affording it in stores.

*The Stop CFC*'s Gold LEED-certified Green Barn (see figure 1) includes a greenhouse that grows organic produce year-round. Under the supervision of an experienced team of growers, children and adults gain hands-on experience in sustainable food production (The Stop, n.d. b). The produce grown is used for drop-in meals and other programs. The space also includes a sheltered garden used to demonstrate season-extension techniques for growing the diverse food plants of Toronto's multicultural communities. To complement community gardens growing produce, a series of large composting units and vermicomposting bins turn food waste into a growing medium for the gardens (The Stop, n.d. b) (see figure 3). Using

**Figure 2: Community Gardens**



(Photo credit: Charles Z. Levkoe)

*The Stop CFC's* growing spaces, composting and food preparation initiatives (see table 1) for hands-on ecological education is considered foundational to *The Stop CFC* model (Scharf et al., 2010).

#### *Food and Wellness*

Providing fresh, nutritious, and delicious food is seen as central to *The Stop CFC* approach (The Stop, n.d. a). *The Stop CFC* has invested in healthy food by raising and targeting funds toward buying it, developing relationships with socially and ecologically conscious food suppliers to source it, and hiring trained, experienced, passionate chefs to prepare it (Scharf et al. 2010). Staff reported in interviews that *The Stop CFC's* drop-in meal program developed as a way to complement the food bank by providing food for people who do not have the ability to cook, to supplement their food access, and to provide a friendly, social space in a community with few public meeting places. Deciding to hire a professional chef to coordinate

**Figure 3: Composting Bins**



(Photo credit: Charles Z. Levkoe)

meal preparation has contributed to an increase in the quality of meals. Participants have reported that a good meal is important, not only for their physical health, but also for their emotional health and a sense of belonging (The Stop, 2010).

*The Stop CFC's* cooking and gardening programs seek to take advantage of the material, social, and emotional power of food. The literature suggests that knowing how to prepare and grow food can be a significant source of personal pride and self-esteem, and can give people the opportunity to participate in meaningful social relationships (Fano, Tyminski, & Flynn, 2004). In 2010, 81% of survey respondents in *The Stop CFC's* nonemergency programs said that their emotional health had improved through their involvement (The Stop, 2010). *The Stop CFC's* education programs target people across the lifecycle, from children (e.g., Sustainable Food Systems Education) and new mothers (e.g., Healthy Beginnings) to marginalized adults and seniors (e.g., Community Kitchens), with an objective to help them to reclaim these skills (see table 1).

*The Stop CFC's* community kitchens and gardens also offer opportunities for people to get their hands dirty and learn basic growing and cooking techniques (see figure 4). They aim to bring people together around food to promote physical activity and healthy eating (The Stop, n.d. b). A review of

the literature about the impacts of community kitchens shows that they can have significant impacts on social supports and connectedness, as well as on personal health behaviors related to diet and nutrition (Engler-Stringer & Berenbaum, 2005; Moldofsky, 2000; Tarasuk, 2001).

**Figure 4: Community Kitchens**



(Photo credit: Anna Prior)

Bringing people together to cook and garden has also revealed benefits ranging from informal and hands-on learning to positive social experiences and the development of mutual support networks. One of *The Stop CFC*'s oldest programs, Healthy Beginnings (see table 1), offers a range of supports for pregnant women to encourage healthy nutrition as well as for new mothers and their children. These include workshops and referrals to ensure healthy birth outcomes and support for breastfeeding. This explicit emphasis on education, combined with practical material help, has yielded impressive results (with 98% healthy birth weights and over 90% of women breastfeeding) (The Stop, 2010).

*The Stop CFC* offers some food for purchase in addition to its emergency food programs. A weekly Good Food Market (see table 1) offers low-cost fresh produce sourced from The Ontario Food Terminal and increasingly from local organic farms. This program seeks to provide healthy food at a reasonable cost to a broader segment of the community.

### *Developing Communities Through Food*

*The Stop CFC* has focused on increasing access to healthy food in ways that support nearby rural communities. For example, staff reported in interviews that a dedicated grant enables a monthly purchase for the food bank's "food of the month," usually an item of fresh produce, often organic and sourced from a local farmer. *The Stop CFC* has also developed a purchasing policy that gives priority to local products and fosters direct relationships with local farmers and with suppliers to purchase top-quality food (without squeezing producers by suggesting they donate or sell produce at a low price). In 2010 alone, staff reported that *The Stop CFC* purchased approximately CA\$70,000 worth of local food (22,000 lbs. (9,980 kg) — or CA\$40,000 worth — of which was local organic food) for its programs. These efforts recognize the community-strengthening potential of food procurement.

*The Stop CFC* works to support program participants in building the skills and knowledge to actively participate in social change efforts in their community. After witnessing the diverse needs and assets of participants, *The Stop CFC*'s staff realized that different types of participation opportunities needed to be created in order to match different levels of capacity to participate and employ assets possessed by community members. Beyond traditional volunteer opportunities, members can join the Community Action program, serve on advocacy committees (which offer a lower-commitment opportunity for involvement), or attend social and political film nights, where everyone is welcome and open conversation is encouraged (see figure 5). *The Stop CFC* staff uses honoraria, internships, and hiring of community members as a way to recognize and respect participants' dedication, commitment, and skills.

With growing popular interest in food issues, *The Stop CFC* has also identified an opportunity to engage people from higher income communities, thereby creating important allies in their work. To encourage this engagement, *The Stop CFC* has developed a range of programs geared at middle-income groups. For example, *The Stop CFC*'s

**Figure 5: Community Action Program**



(Photo credit: Anna Prior)

Farmers' Market at the Green Barn is a largely organic market operated at a profit in a higher-income neighborhood (The Stop n.d. d). However, staff mentioned in interviews that *The Stop CFC* offers a food voucher program for volunteers; the vouchers can be redeemed for fresh produce at the Good Food Market. The objective is to increase access to fresh, healthy food for volunteers, reduce reliance on the food bank, and introduce the benefits of shopping at the Good Food Market to a broader range of consumers.

*The Stop CFC* has also taken an entrepreneurial approach to in-house events, cooking classes, catering, and other revenue-generating activities. These social enterprises have become a way of raising funds to support *The Stop CFC's* programming (The Stop n.d. h). However, *The Stop CFC* organizers also see these types of activities as a way to raise broader public awareness about hunger and system sustainability issues by bringing in and educating different groups of people about food system issues and challenges. In this way, *The Stop CFC* uses food as a community development tool to support a broad range of community members to initiate social action processes.

*The Stop CFC* has also been a part of a number of regional networks such as Sustain Ontario<sup>1</sup> as a founding member, the Toronto Food Policy Council,<sup>2</sup> and urban agriculture coalitions. This participation contributes to building a community of food practice where networks of individuals, organizations, and institutions can share knowledge and experiences related to the food system. By interacting with government bodies and organizations from multiple sectors, communities of practice offer a unique opportunity to learn from others, draw on and develop strategic resources, experiment with new project ideas, and collaborate on broader social change efforts (Friedmann, 2007).

#### *Bringing The Stop CFC to Other Communities*

In the fall of 2010, *The Stop CFC* began working on a process to replicate its CFC model. This involved securing and providing funding and strategic direction to groups in other regions wanting to establish a CFC to enhance their own work. To date, the replication process includes two pilot projects in Stratford and Perth, Ontario; a learning network to share resources on the core principles, program pillars, and evaluation, as well as regular networking events; and the early stages of a national organization to support the process.

Based on conversations with staff, it is clear that *The Stop CFC* recognizes that replication must go beyond simply sharing organizational program models. Its development and growth must be understood within a particular history, geography, and resource environment that may not be replicable elsewhere due to the finite nature of private funding sources and organizational capacity to pursue them. For example, *The Stop CFC* is

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<sup>1</sup> Sustain Ontario: The Alliance for Healthy Food and Farming is a provincewide, cross-sectoral alliance that takes a collaborative approach to research, policy development, and action by addressing the intersecting issues related to healthy food and local sustainable agriculture. See <http://www.sustainontario.com>

<sup>2</sup> The Toronto Food Policy Council is an instrument of local city government that works with all stakeholder groups to develop policies and programs promoting food security. See [http://www.toronto.ca/health/tfpc\\_index.htm](http://www.toronto.ca/health/tfpc_index.htm)

located in a low-income neighborhood surrounded by higher-income communities, which provides access to a middle-class constituency that brings a level of financial resources, skills, and unscheduled time. Further, *The Stop CFC*'s location in Toronto affords access to a large knowledge economy as well as financial and social resources to support non-profit organizations.

It should also be noted that *The Stop CFC* is the result of many hands — staff, participants, and board members — and of a particular historical time and place. In Toronto, the community of food practice, which includes other food-based organizations like FoodShare Toronto<sup>3</sup> and the Toronto Food Policy Council, has made the city a vibrant incubator of food-based projects, and *The Stop CFC* has learned from, and contributed to, the new thinking emerging in this environment.

### **The Community Food Centre Approach**

As the first CFC, *The Stop CFC* offers an important case study through which to explore progressive institutional responses to the problems of the mainstream food system. The innovation of the model and its contribution to the broader food movement is four-fold. First, *The Stop CFC* makes an explicit commitment to a broad set of core values: antipoverty, ecological sustainability, food and wellness, and community building. Organizers at *The Stop CFC* see this broadly integrative approach (in contrast to the more focused approach of many other organizations) as being central to addressing food system issues effectively.

Second, by providing a physical space in conjunction with knowledge and resources, the CFC aims to facilitate integrated programming that goes beyond service delivery. In essence, *The Stop CFC* provides “space” (both literally and figuratively) for food-related activities and organizing.

Third, *The Stop CFC* subsidizes a more equitable and sustainable food distribution system through charitable donations and its own social enterprise efforts. That is, by applying its own resources (generated through donations, social enterprise activities, and volunteer labor), *The Stop CFC* is able to procure quality food at a cost that is manageable to program users, while providing sustainable livelihoods to program suppliers.

Finally, *The Stop CFC* works to directly engage people in the politics of their everyday lives by making connections from food to broader social, political, and ecological issues. *The Stop CFC* addresses the short-term, immediate needs of individuals needing food, but also attempts to build the infrastructure for people to contribute to longer-term social and ecological change. In the sections following, each of these points will be taken up in turn. The potential contributions of *The Stop*'s CFC model will be explored and potential challenges discussed.

### *Values-based Practice: Integrating Antipoverty, Ecological Sustainability, Food and Wellness, and Community-building Values*

As described in table 1, much of *The Stop CFC*'s work incorporates antipoverty, ecological sustainability, food and wellness, and community-building values. More importantly, *The Stop CFC* has been actively working to develop a comprehensive approach that integrates these goals into all of its programming. *The Stop CFC*'s mission, articulated on its website as “[striving] to increase access to healthy food in a manner that maintains dignity, builds community and challenges inequality” (The Stop, n.d. e) highlights the importance of health, community, and social justice. Food programs that address hunger simultaneously work to improve the health of participants and enhance the sustainability of local agriculture through purchasing decisions. Hands-on programs such as community gardens and food skills workshops address issues of food access and healthy living, and can be a first step in connecting and empowering participants. *The Stop CFC*'s community action and advocacy efforts attempt to “directly address the root causes of poverty in our community” (The Stop, n.d. f),

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<sup>3</sup> FoodShare is a Toronto-based nonprofit organization that works on food issues “from field to table” and promotes healthy eating, teaches food preparation and cultivation, develops community capacity, and creates non-market-based forms of food distribution. See <http://www.foodshare.net>



but also work toward changes in food and agricultural policy. *The Stop CFC*, for example, was one of the founding members of Sustain Ontario (a regional cross-sectoral food and farming alliance) and as a member of its steering committee has supported collaborative research, development, and action around policy.

It has been argued elsewhere (Levkoe, 2011) that keeping the values of social justice, ecological sustainability, and democratic decision-making at the forefront of food-related organizing and program development enhances the potential of these activities to contribute to a broader and more meaningful transformation of the food system. By acting on these values within one organization, *The Stop CFC* hopes to achieve fundamental change, both individually (in terms of changing the minds of program participants, volunteers, and others) and structurally (by transforming the food system).

*Building Social Infrastructure:  
The Community Hub Model*

There is a strong place-based element to *The Stop CFC*'s work. Having a physical space that thousands of people can walk into, where they can sit down for a meal, volunteer, cook, make a telephone call, or connect to community resources is essential. *The Stop CFC* is a community space where people can have conversations about food and food policy — be it with staff or with other community members.

As such, *The Stop CFC* is an early example of a community service hub.<sup>4</sup> Two recent provincial reports, the Roots of Youth Violence Report (Curling & McMurtry, 2008) and Ontario's Poverty Reduction Strategy (Government of Ontario, 2009), both discuss the benefits of community hubs for moving beyond service delivery to providing spaces that facilitate connections between individuals and enable communities to become self-sufficient. Building on these reports

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<sup>4</sup> A community service hub, as conceptualized here, should not be confused with a "food hub," which is generally conceived of as infrastructure to connect producers of locally grown food to nearby consumers.

and other literature, *The Stop CFC* can be conceptualized as a community hub with four main benefits. First, through a clustering of services, "hubs" can create synergies and efficiencies for service providers and for service users. In this "one-stop shop" model, users have access to a variety of human services in one location (or alternatively, an interlinked set of complementary services in adjacent locations). Research suggests that access to and awareness of community services are enhanced when services are integrated in a hub (Farrell, Tayler, & Tennent, 2002). The benefits of accessing multiple services in one space can be illustrated by the following anecdote from a report about *The Stop CFC*:

When Robert first came to the drop-in meal program at *The Stop*, he was fighting mad. A former metalworker, he had suffered an injury that left him unable to work and struggling with chronic pain. He was losing his housing and had not been able to access disability benefits. What *Stop* staff saw at first was a man who started fights and spoke so abusively to the people who tried to help him that they wondered whether he should be barred from all but *The Stop*'s emergency programs. The community advocacy coordinator decided to make a last-ditch effort to work with him to address his issues. With her help, he got medical care to manage his pain, secured disability benefits, and found stable housing. Eventually he expressed an interest in volunteering. The volunteer coordinator enlisted the community garden coordinator to put him to work in the garden, in what they hoped would be a soothing environment. Gardening struck a chord with him, and he became an enthusiastic participant in *The Stop*'s gardening program, getting involved with an art project and dusting off some landscaping skills to help out re-landscaping the front garden beds at *The Stop*. Inspired by *The Stop*'s *Yes in My Backyard* project, Robert is now hoping to get his landlord's permission to transform his backyard into a vegetable garden that can be

cultivated by someone without access to a garden. (Scharf et al., 2010, p. 8)

Second, locating numerous services in a single space or connected set of spaces enables staff to gain a better understanding of the needs and dynamics within the community. Beyond exposing residents to the range of services offered, staff and volunteers are able to see how the services interconnect and create mutual-support networks. As the anecdote above illustrates, contact with multiple staff — the community advocacy, volunteer, and garden coordinators — all contributed to building Robert's social support network. Other research has noted that the responsiveness of services is enhanced using a hub approach (Pascal, Bertram, Gasper, Mould, Ramsden, & Saunders, 1999).

A third benefit is that the clustering of services in one location provides an opportunity to establish community space. By providing a physical space for neighborhood residents to meet, get to know each other and become engaged in their community, the CFC uses food to bring people together. Studies have shown that as social cohesion increases, mortality rates, suicide, and poor general and mental health decrease (Stafford et al., 2003). By connecting neighborhood residents to each other (as well as to volunteers and staff), *The Stop CFC* aims to enhance social cohesion.

Finally, community hubs provide the social infrastructure required for the effective use of community resources (Casey, 2005; Cowen & Parlette, 2010; Eakin, 2004). The “hard” physical resources (e.g., meeting rooms, computer and Internet access, insurance coverage) as well as “soft” infrastructure (e.g., staff support for recruiting, training, and supervising volunteers) available at the CFC provide continuity across hub activities and over time. A number of studies over the last decade show a gain of between 2 and 11 dollars of public benefit and/or cost savings for every dollar invested in social infrastructure (Aos, Lieb, Mayfield, Miller, & Pennucci, 2004; Karoly, Kilburn, Bigelow, Caulkins, Cannon, & Chiesa, 2001; Karoly & Bigelow, 2005).

### *Subsidizing the Food System Through the Community Food Centre*

*The Stop CFC* works to achieve its multiple goals by subsidizing food distribution through charitable donations and its own social enterprise efforts. That is, revenue generated in one area (fundraising and events including catering and dinners at the *Green Barn*) is used to support programs in other areas that would otherwise not be affordable to participants (either producers or consumers). By making food in some programs free or low-cost (i.e., by covering all or most of the costs associated with its production and distribution), this subsidy attempts to fill the gaps left by inadequate social programs, and helps develop accessible food distribution mechanisms that support local food economies. For example, interviews with staff revealed *The Stop CFC* uses donations to purchase sustainably produced food within adjacent agricultural regions, and to pay a fair price to farmers for that food. Similarly, volunteer labor (in place of paid labor) allows programs to run at lower cost to the organization. Ultimately, this subsidy is intended not only to provide immediate benefits to producers and consumers, but more importantly to begin to build the infrastructure (in food production and distribution) that can eventually serve as a model for a more substantive transformation of the existing (food) system.

*The Stop CFC* currently operates almost entirely on the basis of charitable donations, grants from foundations, and in-kind donations from individuals and organizations, with very little government support. *The Stop CFC* staff believes their work should be supported by the state. Conversations revealed that they recognize the limited and partial nature of the CFC's work, and continue to try to push this subsidy back into government hands — for example, through more adequate welfare provision, and through policies that would support local agriculture — through *The Stop CFC*'s advocacy work. This has been the driving force behind the provincial Do the Math and Put Food in the Budget campaigns (see, for example, Saul, 2010).

### *Engaging People in the Food Movement*

By providing services that help to meet some of people's most pressing needs, *The Stop CFC* aims to open the door for people to participate in other programs that engage and support them in more profound ways. Once through the door, people have the chance to develop cooking or gardening skills, to connect to social services and to others in the community, or to contribute to broader movements for social change. In this way, *The Stop CFC* uses a therapeutic community development model (Bopp & Bopp, 2001) to engage people at various stages in their personal development, and makes resources available to support them as individuals and for broader community development. Participants are given a number of opportunities to help shape the programs and services they use. For example, they are encouraged and given mechanisms to provide ongoing feedback to staff, participate in annual general meetings, and when able, return to *The Stop CFC* as volunteers or paid interns. According to *The Stop CFC* website, involving program participants as volunteers and advocates "will end the way charity divides us as a society into the powerful and the powerless, the self-sufficient and the shamed" (The Stop, n.d. e).

Literature on participation suggests that for people to participate in broader social change efforts, engagement must feel safe and comfortable, and incorporate enjoyable social opportunities. It is also important to define intermediate advocacy goals that are satisfying and doable, so participants do not become disenchanted (Farmer & Fedor, 1999; Mackenzie-Mohr, 2011). Through the civic engagement programs described above, *The Stop CFC* attempts to find appropriate ways for people with diverse needs and skills to be involved, while recognizing the limitations that poverty and marginalization can create. Staff report that, when dealing with marginalized community members, simply offering the opportunity for input, or handing over the responsibility for things such as meeting facilitation, event organizing, or advocacy campaigns, is unrealistic and ultimately frustrating for participants. Instead, through facilitation and support, experienced staff and volunteers attempt

to create space for participants to make engagement with social issues possible and to understand what is achievable. For *The Stop CFC*, this approach has taken the form of supporting people materially to participate in decision-making (by providing food, transportation, honoraria, and child care) and offering educational opportunities to develop contextual knowledge and organizing skills.

### **Challenges and Tensions: Navigating the Bumpy Terrain of Social Change**

*The Stop CFC* has had many successes over the past 30 years; however, this approach has not come without its challenges and is not a panacea. The nonprofit sector has been subject to many critiques, from serving to limit advocacy for social justice and broader social change (Ilcan & Basok, 2004) to being complicit in neoliberal state restructuring (Mitchell, 2001). *The Stop CFC* is not immune to these critiques, and it has struggled to develop its model through a reflexive awareness of the challenges facing the broader sector. Recognizing these challenges and negotiating these tensions has been an important part of the development of *The Stop CFC* and is vital for the consideration of future implementation of this model.

One tension that has created challenges for *The Stop CFC* is associated with the nature of neighborhood-based interventions. Bringing services into the communities that need them most is commendable, but neighborhood-based initiatives (such as the CFC model presented here) have the potential to create disparities in overserved and underserved neighborhoods, particularly when hub development is associated with particular localized social service and/or charitable organizations rather than a broader and more systematic approach to identifying needs (Fyfe & Milligan, 2003). In addition, initiatives provided through community service and charitable organizations typically have varying standards and expectations, in contrast to the universal standards of government welfare programs (Trudeau, 2008), although these admittedly have eroded.

Over its history, *The Stop CFC* has attempted to align its operations with areas of need (for example, by choosing the site for its relocation into the Davenport neighborhood based in part on its socioeconomic characteristics), has developed a clear set of core principles and programming pillars that constitute the basis of the CFC (The Stop, n.d. g), and has partnered with hundreds of stakeholders across the province (including Sustain Ontario and the Ontario Association of Food Banks) in order to better understand and navigate the needs and assets within the sector. However, given the multiple factors at play in the organization's decision-making (including revenue generation, site suitability and appropriate management of scarce resources), making decisions solely based on the "need" of local communities is not realistic. In addition, *The Stop CFC* as a single organization is not in a position to articulate — let alone provide — a uniform geography of food (and other) service provision that would meet the needs of city residents in any kind of systematic way.

There are examples of neighborhood-based organizations in other places attempting to overcome these challenges by working together to both standardize their offerings and provide comprehensive geographic coverage, to the extent that this is possible within their resources (see, for example, the work of the Emergency Food System Planning Team in the adjacent city of Hamilton (Emergency Food System Planning Team, 2009)). This kind of interorganizational cooperation could be a useful next step in the context of this case study, although the complexity and territoriality of the emergency food sector (and the charitable sector more generally — Lethabo-King & Osayande, 2007; Milligan & Fyfe, 2004) makes it a particularly challenging exercise. To date, this has not been identified as a priority of *The Stop CFC*.

This leads into what is perhaps the most fundamental challenge for CFC model: that the creation of service hubs organized by social service/charitable organizations allows, and indeed may contribute to, the further erosion of the welfare state. As was discussed earlier in relation to food banks, the "taking over" of social service provision

by charitable organizations (albeit in a fragmented and inconsistent way) allows governments to evade their responsibility to provide a minimum standard of welfare to their citizens through universal public programs (Wolch, 1989). At the same time, government (and to a certain extent, charitable foundation) funding of charitable organizations is seen to constrain the extent to which they can undertake radical social action (Smith, 2007).

*The Stop CFC* is a particularly interesting example here, as its lack of government funding demonstrates the organization's effective fundraising and social entrepreneurship (Ryzin, Grossman, DiPadova-Stocks, & Bergrud, 2009). However, this is in practice neither an unmitigated blessing nor an unforgivable curse. Ultimately, part of *The Stop CFC*'s success comes from being able to avoid the rigid constraints that come with government funding. That is, by avoiding state funding, *The Stop CFC* has also been able to avoid efforts to moderate or temper its activities. However, this self-sufficiency and lack of government involvement or regulation could be seen as contributing to the fragmentation and erosion of state-provided social services attendant in neoliberalism (see Hackworth, 2009). Leadership at *The Stop CFC* is well aware of this tension, and has attempted to find a balance between self-sufficiency (and the opportunities for self-determination that affords) and a role for government. Interestingly, a key component of the ongoing CFC replication process is an effort to build a case for government to play a major role in funding nascent CFCs. This, and *The Stop CFC*'s ongoing advocacy efforts (which focus on re-involving the state in the provision of basic social services, particularly adequate welfare payments), point to an ongoing reflexivity about funding sources as well as an overarching attention to system-wide issues that is uncommon in both alternative food initiatives and the charitable sector more generally. At the same time, operationalizing the CFC model on a scale where a substantial shift in the status quo could be observed in relation to major food and other systemic issues such as hunger or environmental degradation is an enormous task. While replication of the CFC model is a current priority, *The Stop*

CFC is only in a position to pilot two new CFCs over two years. The slow pace of change, the mismatch in the scale of problem and the CFC “solution,” and the many challenges and tensions that need to be worked through as the projects move forward could lead observers to be skeptical of the radical potential of the CFC model. However, this skepticism is not a critique of the CFC model per se, but rather a recognition of the significance of the social change required. It is important that the recognition of the magnitude of these challenges not lead to paralysis, but rather to further and more widespread efforts to create change (Wakefield, 2007).

It should also be noted that *The Stop CFC*'s engagement with certain aspects of (or perhaps more rightly, interpretations of) the key elements of a values-based practice as described earlier — namely antipoverty, ecological sustainability, food and wellness, and community building — is not always as comprehensive in practice as might be hoped for in theory. By ensuring that the food available in its programs is healthy and as far as possible sustainably produced, by creating a welcoming, inclusive environment for program users and volunteers, and by encouraging more active engagement in the community and with social problems, *The Stop CFC* goes a long way toward providing a model for a more humane and sustainable food system. It does appear, however, that a somewhat selective interpretation of both social justice and democracy has informed its work. To be more specific, the focus on social justice articulated in its mission statement and elsewhere is often supplanted by a more narrow concern with the social welfare of the poor (i.e., antipoverty efforts). A concern with the humane treatment of those with fewer resources, and the important role of the state in providing that care, is laudable, and it should be noted that they have taken activism against poverty to heart, unlike many similar organizations. In addition, *The Stop CFC* has attempted to find ways to broaden its values-based practice to include local economic development (e.g., by purchasing food from local farms). However, this is not quite the same thing as a

fundamental commitment to a fair and equitable food system, in which questions around, for example, the distribution of resources in society and the treatment of food workers might play a greater role. This is an area where the CFC model in future could direct more attention.

Similarly, *The Stop CFC*'s commitment to involving members in shaping the organization — for example, through their involvement in annual general meetings, as staff, interns and/or volunteers, and by giving regular opportunities for feedback on programs — go beyond many similar organizations. In addition, its engaging of members and others in broader democratic systems through its advocacy campaigns indicates a significant commitment to political life. At the same time, the organization has struggled with ways to include members and volunteers throughout the governance structure of the organization. In the past, service users have served on *The Stop CFC*'s board of directors, but their feedback revealed that the experience was often quite alienating. Failing to find ways to create participatory democratic structures within as well as external to the operations of *The Stop CFC* may be a missed opportunity. However, it is important to highlight how far *The Stop CFC* has come in both of these areas when compared to many other, similar organizations. This focuses attention on the broader structural challenges — including everything from the reluctance of funding agencies to support social justice oriented work (Lethabo-King & Osayande, 2007) to the fundamental material inequalities and cultural biases that dictate opportunities for participation in civic life (Wakefield & Poland, 2005) — that must be overcome to create meaningful change in these areas.

*The Stop CFC* offers a vision and a structure that encompasses a set of basic principles that can be adapted to meet the specific needs of a particular community. However, this model should not be unreflexively copied within different contexts. Even in its current context, *The Stop CFC* is not without room for improvement, and the model should be opened to critical scrutiny and under-

stood as only one part of the transition to a more socially just, ecologically sustainable, healthy and democratic food system. Replication should not be excessively prescriptive; instead, the constitution of each CFC needs to take into consideration the specific strengths, weaknesses, opportunities, and concerns of its geographical and historical context.

In order to create opportunities for future organizational learning and improvement, *The Stop CFC* has created its “learning network” as an interactive exchange of information and ideas. It is a place for *The Stop CFC* to share resources and information about the CFC model but also for others to engage in discussion about solutions to pressing food-related issues and provide ideas and feedback to *The Stop CFC*.

This effort highlights a key asset of *The Stop CFC*: an ability to be reflexive about its own activities and recognize and respond to criticism. Over time, the organization has taken to heart criticisms, for example, the undignified nature of food banks, and the ways that charity can undermine advocacy, and has done what it can to address them. These efforts have not always been fully successful, and are shaped by the same societal and structural constraints that *The Stop CFC* seeks to challenge. However, the organization explicitly acknowledges and struggles through these challenges; staff report that these issues are routinely included for discussion at training events. This willingness to listen and adapt is important in any organization that wants to create truly positive social change.


### **Conclusion: Turning the Food Bank on its Head**

Taking into account the challenges articulated above, there is much to learn from the CFC model. The creation of spaces to support food-related activities is important not only as a platform for community development, but also as an incubator for practices and relationships that will be essential to any future sustainable, healthy, just, and democratic food system. By addressing a diversity of social and ecological goals, within programs as well as across the different activities of the organization, *The Stop CFC* is able to promote a more compre-

hensive understanding of food system issues and their possible solutions than is often the case. And, by explicitly focusing on the power of food to engage and interest people in all walks of life, *The Stop CFC* is actively working to enhance understanding of food system issues and to encourage action to spur fundamental change in the food system that goes well beyond its own programs and activities.

It is important to recognize how *The Stop CFC* itself has been shaped by its context. In the same way that any future CFCs should be developed to take into consideration the specifics of local geographies and histories, *The Stop CFC* is itself a product of these factors. *The Stop CFC* is a creature of its environment, both practical and discursive; its activities have been supported and at the same time bounded by its funding sources, as well as by the understandings of its leaders, staff, board members, volunteers, and members. The evolution of *The Stop CFC* into an innovative and important actor within the regional, national, and potentially global food movement is due in part to its location in a city where considerable other related work is taking place (see Wekerle, 2004) and to its active participation in a community of food practice. The activities of other local organizations (e.g., Food-Share) and local government (particularly the formation of the Toronto Food Policy Council) have created fertile ground for the expansion of the organization in innovative ways. At the same time, broader societal pressures, such as the ongoing withdrawal of the state from social service provision, and the restructuring of the agricultural sector in ways that limit the ability of small farms to access the market cost-effectively, have shaped the organization's activities. Similarly, broader societal discourses have made particular framings of social justice more palatable than others, and this in turn shapes the practices of the organizations operating within these contexts.

It is important, then, not to position *The Stop CFC* as an “exceptional actor” that has managed to overcome all the constraints of its context to become an ideal model for future work. Instead, we conclude that what makes *The Stop CFC* an

exciting model for food system transformation is the way that it has struggled, within a particular context, to work to transform the food system. With this in mind, the critiques raised, while important, should not be taken to imply that the success or failure of *The Stop CFC* is predetermined. Rather, they highlight the situatedness of *The Stop CFC* as an organization with both a history and a future, which connect in myriad ways to the history (and future) of the broader society from which it emerged. At the same time, one of the singular and important features of *The Stop CFC* is its reflexivity and ability to recognize and respond to the constraints of its setting. In the past, *The Stop CFC* has been transformed from an emergency food program (with all the attendant critiques) into a multifaceted CFC — and it is highly unlikely that this transformation is now somehow complete. In this context, the example of *The Stop CFC* can be understood as a work in progress, the success and struggles of which can inform the broader food movement as it works towards a more sustainable, just, healthy, and democratic food system for all. 

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### References

- Allen, P. (1999). Reweaving the food security safety net: Mediating entitlement and entrepreneurship. *Agriculture and Human Values*, 16(2), 117–129. <http://dx.doi.org/10.1023/A:1007593210496>
- Allen, P. (2004). *Together at the table: Sustainability and sustenance in the American agrifood system*. Philadelphia, Pennsylvania: Pennsylvania State University Press.
- Allen, P. (2010). Realizing justice in local food systems. *Cambridge Journal of Regions, Economy and Society*, 3(2), 295–308. <http://dx.doi.org/10.1093/cjres/rsq019>
- Allen, P., FitzSimmons, M., Goodman, M., & Warner, K. (2003). Shifting plates in the agrifood landscape: The tectonics of alternative agrifood initiatives in California. *Journal of Rural Studies*, 19(1), 61–75. [http://dx.doi.org/10.1016/S0743-0167\(02\)00047-5](http://dx.doi.org/10.1016/S0743-0167(02)00047-5)
- Allen, P., Goodman, M., FitzSimmons, M., & Warner, K. (2003). *Alternative food initiatives in California: Local efforts address systemic issues* (Paper brief No. 4). Center for Agroecology and Sustainable Food Systems, University of California, Santa Cruz.
- Aos, S., Lieb, R., Mayfield, J., Miller, M., & Pennucci, A. (2004). *Benefits and costs of prevention and early intervention programs for youth*. Olympia, Washington: Washington State Institute for Public Policy.
- Artscape. (n.d.). Components: Highlights of the Barns. Retrieved 21 November 2011 from <http://www.torontoartscape.org/artscape-wychwood-barns/project-highlights>
- Bopp M., & Bopp, J. (2001). *Recreating the world: A practical guide to building sustainable communities*. Calgary: Four Worlds Press.
- Buttel, F. (1997). Some observations on agrifood change and the future of agricultural sustainability movements. In D. Goodman & M. Watts (Eds.), *Globalizing food: Agrarian questions and global restructuring* (344–365). New York: Routledge.
- Casey, S. (2005). *Establishing standards for social infrastructure*. University of Queensland Boilerhouse Community Engagement Centre.
- Canadian Cooperative Association (CCA). (2009). *Lay of the land: Local food initiatives in Canada*. Author. Retrieved 1 May 2011 from [http://www.coopscanada.coop/public\\_html/assets/firefly/files/files/The Lay of the Land Final June 16 2009.pdf](http://www.coopscanada.coop/public_html/assets/firefly/files/files/The Lay of the Land Final June 16 2009.pdf)

- City of Toronto. (2006). City of Toronto Ward 17 Davenport Profile. Retrieved on 1 December 2010 from <http://www.toronto.ca/wards2000/ward17.htm>
- Cowen, D., & Parlette, V. (2010). *Social infrastructure in the inner suburbs: Poverty and the Priority Neighbourhoods Strategy in East Scarborough* (unpublished report). Department of Geography and Programme in Planning, University of Toronto.
- Curling, A., & McMurtry, R. (2008). The Third Pillar: Building Strong Communities to Address the Roots of Violence Involving Youth (Chapter 9). *Findings, analysis and conclusions (volume 1), Roots of Youth Violence Report*. Ontario Ministry of Children and Youth Services. Retrieved from <http://www.rootsofyouthviolence.on.ca>
- Diani, M., & Bison, I. (2004). Organizations, coalitions and movements. *Theory and Society*, 33(3–4), 281–309. <http://dx.doi.org/10.1023/B:RYSO.0000038610.00045.07>
- Do The Math. (n.d.). Do The Math website. Retrieved 1 May 2011 from <http://dothemath.thestop.org>
- Eakin, L. (2004, May). *Community capacity draining: The impact of current funding practices on non-profit community organizations*. Community Social Planning Council of Toronto in collaboration with the City Community Workgroup on Core Funding. Retrieved from <http://neighbourhoodcentres.ca/reportspub/Community%20Capacity%20Draining%20Report.pdf>
- Elton, S. (2010). *Locavore: From farmers' fields to rooftop gardens: How Canadians are changing the way we eat*. Toronto: Harper Collins.
- Emergency Food System Planning Team. (2009). *No one goes hungry: Strategic directions for Hamilton's Emergency Food System Plan 2010–2012*. City of Hamilton, Ontario. Retrieved from <http://www.hamilton.ca/NR/rdonlyres/1A6083FA-63B1-4024-AC35-A429A20DBFA7/0/Nov18Item75CS09072REPORTEmergencyFoodSystemPlanFINAL21.pdf>
- Engler-Stringer, R., & Berenbaum, S. (2005). Collective kitchens in Canada: A review of the literature. *Canadian Journal of Dietetic Practice and Research*, 66(4), 246–251. <http://dx.doi.org/10.3148/66.4.2005.246>
- Fano, T. J., Tyminski, S. M., & Flynn, M. A. T. (2004). Evaluation of a collective kitchens program: Using the population health model. *Canadian Journal of Dietetic Practice and Research*, 65(2), 72–80. <http://dx.doi.org/10.3148/65.2.2004.72>
- Farmer, S. M., & Fedor, D. B. (1999). Volunteer participation and withdrawal. *Nonprofit Management and Leadership*, 9(4), 349–368. <http://dx.doi.org/10.1002/nml.9402>
- Farrell, A., Tayler, C. P., & Tennent, L. (2002, April). Community hubs: Their potential to enhance social capital and service provision for families and young children. Presentation at the World Forum Conference, Auckland, New Zealand. Retrieved from <http://eprints.qut.edu.au/292/>
- Food Banks Canada. (2010). *HungerCount 2010: A comprehensive report on hunger and food bank use in Canada*. Toronto, Ontario: Author. Retrieved from <http://www.foodbanksCanada.ca>
- Friedmann, H. (2007). Scaling up: Bringing public institutions and food service corporations into the project for a local, sustainable food system in Ontario. *Agriculture and Human Values*, 24(3), 389–398. <http://dx.doi.org/10.1007/s10460-006-9040-2>
- Fyfe, N., & Milligan, C. (2003). Space, citizenship, and voluntarism: Critical reflections on the voluntary welfare sector in Glasgow. *Environment and Planning A*, 35(11), 2069–2086. <http://dx.doi.org/10.1068/a353306>
- Government of Ontario. (2009). Stronger, healthier communities (Chapter 2). *Breaking the Cycle: Ontario's Poverty Reduction Strategy*. Retrieved from <http://www.Ontario.ca/breakingthecycle>
- Hackworth, J. (2009). Neoliberalism, partiality, and the politics of faith-based welfare in the United States. *Studies in Political Economy*, 84, 155–179.
- Hobbs, K., MacEachern, W., McIvor, A., & Turner, S. (1993). Waste of a nation: Poor people speak out about charity. *The Canadian Review of Social Policy*, 31, 94–104.
- Ilcan, S., & Basok, T. (2004). Community government: Voluntary agencies, social justice, and the responsabilization of citizens. *Citizenship Studies*, 8(2), 129–144. <http://dx.doi.org/10.1080/1362102042000214714>
- Johnston, J., & Baker, L. (2003). Eating outside the box: FoodShare's good food box and the challenges of scale. *Agriculture Food and Human Values*, 22, 313–325. <http://dx.doi.org/10.1007/s10460-005-6048-y>
- Karoly, L., & Bigelow, J. (2005). *The economics of investing in universal pre-school education in California*. Santa Monica, California: The Rand Corporation.



- Karoly, L., Kilburn, M., Bigelow, J., Caulkins, J., Cannon, J., & Chiesa, J. (2001). *Assessing the costs and benefits of early childhood intervention programs*. Santa Monica, California: The Rand Corporation.
- Katz, S. E. (2006). *Revolution will not be microwaved: Inside America's underground food movement*. White River Junction, Vermont: Chelsea Green.
- Kirbyson, A. M. (Ed.). (2005). *Recipes for success: A celebration of food security work in Canada*. Chicago, Illinois: Independent Publishers Group.
- Koc, M., MacRae, R., Mougeot, L., & Welsh, J. (Eds.). (1999). *For hunger-proof cities: Sustainable urban food systems*. Ottawa, Canada: International Development Research Centre.
- Lethabo-King, T., & Osayande, E. (2007). The filth on philanthropy. In Incite! Women of Colour Against Violence (Ed.), *The revolution will not be funded*. Cambridge, Massachusetts: South End Press.
- Levkoe, C. (2011). Towards a transformative food politics. *Local Environment*, 16(7): 687–705. <http://dx.doi.org/10.1080/13549839.2011.592182>
- Levkoe, C. (2006). Learning democracy through food justice movements. *Agriculture and Human Values*, 23(1), 89–98. <http://dx.doi.org/10.1007/s10460-005-5871-5>
- Levkoe, C. (2004). Widening the approach to food insecurity: The Stop Community Food Centre. *The Canadian Review of Social Policy*, 52, 128–132.
- Mackenzie-Mohr, D. (2011). *Fostering sustainable behavior* (third edition). Gabriola Island, British Columbia: New Society Publishers.
- Milligan, C., & Fyfe, N. (2004). Putting the voluntary sector in its place: Geographical perspectives on voluntary activity and social welfare in Glasgow. *Journal of Social Policy*, 33(1), 73–93. <http://dx.doi.org/10.1017/S0047279403007268>
- Mitchell, K. (2001). Transnationalism, neo-liberalism, and the rise of the shadow state. *Economy and Society*, 30(2), 165–189. <http://dx.doi.org/10.1080/03085140120042262>
- Moldofsky, Z. (2000). Meals made easy: A group program at a food bank. *Social Work with Groups*, 23(1), 83–96. [http://dx.doi.org/10.1300/J009v23n01\\_06](http://dx.doi.org/10.1300/J009v23n01_06)
- Pascal, C., Bertram, T., Gasper, M., Mould, C., Ramsden, F., & Saunders, M. (1999, July). *Research to inform the Early Excellence Centre's pilot program*. Worcester, UK: Centre for Research in Early Childhood.
- Poppendieck, J. (1998). *Sweet charity: Emergency food and the end of entitlement*. New York, New York: Penguin.
- Power, E. (1999). Combining social justice and sustainability for food security. In M. Koc, R. MacRae, L. Mougeot, and J. Welsh (Eds.), *For Hunger-Proof Cities* (pp. 30–37). Ottawa: International Development Research Centre.
- Put Food in the Budget [PFB]. (n.d.). *About [Put Food in the Budget]*. Retrieved 21 November 2011 from <http://povertywatchontario.ca/put-food-in-the-budget/>
- Russell, C. (2002, Fall). In the beginning. *The Stop News*, 2.
- Ryzin, G., Grossman, S., DiPadova-Stocks, L., & Bergrud, E. (2009). Portrait of the social entrepreneur: Statistical evidence from a US panel. *Voluntas*, 20(2), 129–140. <http://dx.doi.org/10.1007/s11266-009-9081-4>
- Saul, N. (2010, April 10). Reality of living on social assistance. *The Toronto Star*. Retrieved 1 May 2011 from <http://www.thestar.com/opinion/article/790638--reality-of-living-on-social-assistance>
- Saul, N. (2002, Fall). The name gain. *The Stop News*, 1.
- Scharf, K., Levkoe, C., & Saul, N. (2010). In every community a place for food: The role of the Community Food Centre in building a local, sustainable and just food system. Metcalf Food Solutions Paper. Retrieved 1 October 2011 from <http://www.metcalffoundation.com>
- Slocum, R. (2006). Anti-racist practice and the work of community food organizations. *Antipode*, 38(2), 327–349. <http://dx.doi.org/10.1111/j.1467-8330.2006.00582.x>
- Smith, A. (2007). Introduction. In Incite! Women of Colour Against Violence (Ed.), *The revolution will not be funded*. Cambridge, Massachusetts: South End Press.
- Stafford, M., Bartley, M., Sacker, A., Marmot, M., Wilkinson, R., Boreham, R., & Thomas, R. (2003). Measuring the social environment: Social cohesion and material deprivation in English and Scottish neighbourhoods. *Environment and Planning A*, 35(8), 1459–1475. <http://dx.doi.org/10.1068/a35257>
- Tarasuk, V. (2001). A critical examination of community-based responses to household food insecurity in Canada. *Health Education & Behavior*, 28(4), 487–499. <http://dx.doi.org/10.1177/109019810102800408>

- Tarasuk, V., & Eakin, J. (2003). Charitable food assistance as a symbolic gesture: An ethnographic study of food banks in Ontario. *Social Science and Medicine*, 56(7), 1505–1515. [http://dx.doi.org/10.1016/S0277-9536\(02\)00152-1](http://dx.doi.org/10.1016/S0277-9536(02)00152-1)
- The Stop Community Food Centre (The Stop). (2010). The Stop By The Numbers 2009/2010. Annual Survey. The Stop Community Food Centre, Toronto, Ontario.
- The Stop. (2009, August 31). Audited annual financial statements The Stop Community Food Centre, Toronto, Ontario.
- The Stop. (n.d. a). *The Stop's Healthy Food Philosophy*. Retrieved 21 May 2011 from <http://www.thestop.org/community-food-centre-model>
- The Stop. (n.d. b). *The Stop Community Food Centre's Programs*. Retrieved 21 May 2011 from <http://www.thestop.org/community-food-centre-model>
- The Stop. (n.d. c). *Urban Agriculture*. Retrieved 21 May 2011 from <http://www.thestop.org/community-gardens>
- The Stop. (n.d. d). *Food Markets and Bake Oven*. Retrieved 21 May 2011 from <http://www.thestop.org/bake-ovens-markets>
- The Stop. (n.d. e). *Mission*. Retrieved 21 May 2011 from <http://www.thestop.org/mission>
- The Stop. (n.d. f). *Community Action*. Retrieved 21 May 2011 from <http://thestop.org/community-action>
- The Stop. (n.d. g). *What is a Community Food Centre?* Retrieved 21 May 2011 from <http://www.thestop.org/community-food-centre-model>
- The Stop CFC. (n.d. h). *Catering*. Retrieved 21 May 2011 from <http://www.thestop.org/catering>
- Trudeau, D., (2008). Junior partner or empowered community? The role of non-profit social service providers amidst state restructuring in the US. *Urban Studies*, 45(13), 2805–2827. <http://dx.doi.org/10.1177/0042098008098207>
- Uvin, P., & Miller, D. (1996). Paths to scaling-up: Alternative strategies for local nongovernmental organizations. *Human Organization*, 55(3), 344–354. Available at <http://sfaa.metapress.com/openurl.asp?genre=article&eissn=1938-3525&volume=55&issue=3&epage=344>
- Wakefield, S. (2007). Reflective action in the academy: Exploring praxis in critical geography using a “food movement” case study. *Antipode*, 39(2), 331–354. <http://dx.doi.org/10.1111/j.1467-8330.2007.00524.x>
- Wakefield, S., & Poland, B. (2005). “Family, friend or foe?” Critical reflections on the relevance and role of social capital in health promotion and community development. *Social Science and Medicine*, 60(12), 2819–2832. <http://dx.doi.org/10.1016/j.socscimed.2004.11.012>
- Wekerle, G. (2004). Food justice movements: Policy, planning and networks. *Journal of Planning Education and Research*, 23(4), 378–386. <http://dx.doi.org/10.1177/0739456X04264886>
- Winne, M. (2010). *Food rebels, guerrilla gardeners, and smart-cookin' mamas: Fighting back in an age of industrial agriculture*. Boston, Massachusetts: Beacon Press.
- Wolch, J. R. (1989). The shadow state: Transformations in the voluntary sector. In J. Wolch & M. Dear (Eds.), *The Power of Geography: How Territory Shapes Social Life* (197–221). Boston, Massachusetts: Unwin Hyman.

## Consumer preference for locally grown produce: An analysis of willingness-to-pay and geographic scale

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### Abstract

This study examines consumers' willingness-to-pay for locally grown fresh produce under five definitions of "local," including a generic term "locally grown" and four geographic intervals: multistate, state, regional, and county. A survey of 482 area residents in Evansville, Indiana, was conducted to examine how estimated price premiums vary with

geographic scale. The results suggest that as the geographical scale shrinks, the estimated price premium increases. However, the differences across geographic intervals may not be substantial. Therefore, producers may expect similar price premiums when sourcing from larger geographic areas, and local food systems may ensure consistent profit margins while minimizing the costs of acquiring "local" foods.

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### Keywords

fresh produce, local foods, willingness-to-pay

### Introduction and Literature Review

As Congress prepares the 2012 Farm Act, food and health issues are expected to be at the forefront of policy discussions. One area which has received increased attention is the rise of the local foods movement. The local foods movement is the result of several public concerns related to the agricultural sector, including environmental issues stemming from the geographic dimensions of food distribution, community food security, perceptions of large agricultural corporations, a better under-

standing of the origin of food, and support for local farmers (Guptill & Wilkins, 2002). In recent years, the movement has been the focus of best-selling books, newspaper and magazine articles, television news stories, and federal law and regulations (Hand & Martinez, 2010).

The existing literature provides several examples of the economic benefits of local food systems. Farmers have the capacity to retain a greater share of the retail purchase price of food items (Darby, Batte, Ernst, & Roe, 2008; Starr et al., 2003; Zepeda & Li, 2006). Local food systems may lead to growth in local labor markets (Roininen, Arvola, & Lahteenmaki, 2006) and increased business for nearby establishments (Lev, Brewer, & Stephenson, 2003). In addition, Conner, Knudson, Hamm, and Peterson (2008) and Swenson (2009) demonstrate that local food systems can improve local economies through import substitution. That is, local consumers increase the consumption of locally produced items relative to those “imported” from outside the area, thereby increasing local income by retaining local spending. As a result, local food systems are often lauded as an important development strategy in rural areas (Ikerd, 2005; Marsden, Banks, & Bristow, 2000; Ross, Anderson, Goldberg, Houser, & Rogers, 1999).

Proponents of the movement suggest that local foods are also associated with many health benefits, and that local foods may be fresher, less processed, and retain more nutrients. Moore, Diez Roux, Nettleton, and Jacobs (2008) and Morland, Wing, and Roux (2002), therefore, suggest that local foods may lead to healthier dietary choices. The health benefits may also extend to improved community health outcomes (Bagdonis, Hinrichs, & Schafft, 2009; Conner & Levine, 2007; Lea, Phillips, Ward, & Worsley, 2006; Vogt & Kaiser, 2008).

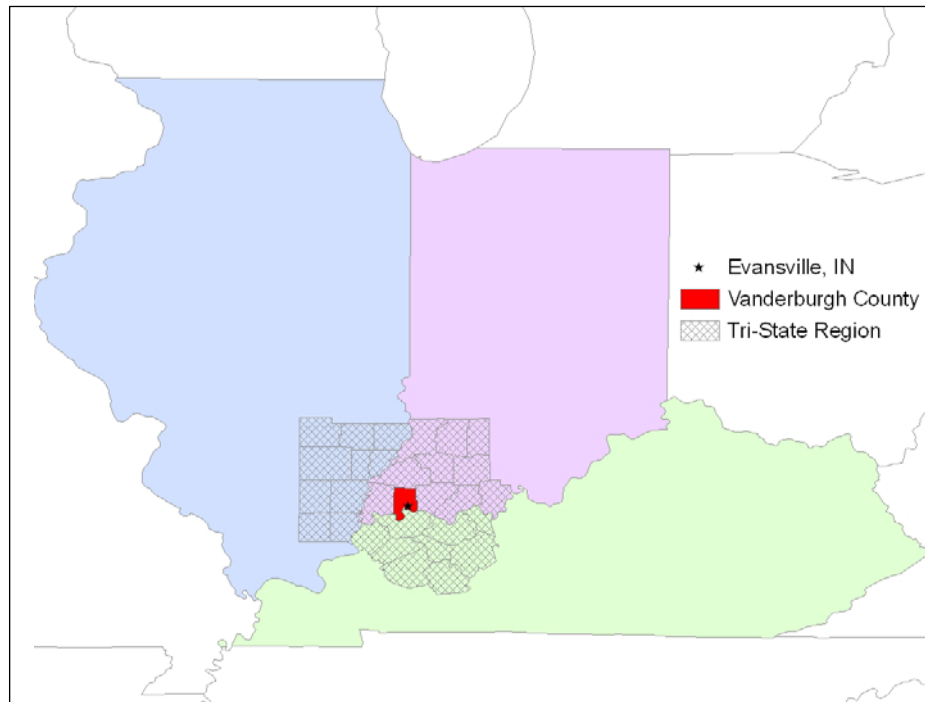
While local food systems can improve local economies and provide health benefits, there is little consensus on the definition of “local” as it relates to the local food movement (Hand & Martinez, 2010). The 2008 Farm Act (formally the Food, Conservation, and Energy Act of 2008)

defines a locally produced agricultural food product as one that is transported less than 400 miles (644 kilometers) from its origin or that remains within the state in which it was produced. However, the term more generally implies food sourced from *nearby* farms and producers (Hand, 2010). Durham, King, and Roheim (2009) suggest that consumers exhibit variation in what they consider “local.” In a survey of both producers and consumers in Washington state, Selfa and Quazi (2005) found significant variability in respondents’ definition of “local.” The authors therefore conclude, “this variability suggests that we, as researchers, need to continue to refine our investigations and our methodologies in order to uncover the nuances in meaning and purpose in the constructions of ‘local’ food systems” (p. 462).

Given that “local” may carry different meanings to different consumers, this study examines consumers’ willingness-to-pay (WTP) for locally grown, fresh produce under four alternative geographic definitions, as well as a generic “grown locally” designation. Martinez et al. (2010) note that one of the major challenges in designing a local food system is estimating the amount that consumers would be willing to pay for local products. The estimated price premiums may be helpful in cost-benefit analyses of proposed expansions of local food systems. Previous studies have demonstrated that the costs of direct marketing can present obstacles to expanding local food sales (for example, Biermacher, Upson, Miller, & Pitman, 2007). Varying the geographic intervals can help identify whether the costs of sourcing food items at a small geographic scale are met by consumers’ potential price premiums.

In a comprehensive review of the local foods literature, Martinez et al. (2010) noted that identifying consumers’ WTP for locally produced foods is useful in marketing local foods, and cites a number of studies that have examined the price premiums for local foods. The demand for locally grown fresh produce has been previously examined in a number of areas, such as Tennessee (Brooker & Eastwood, 1989), Missouri (Brown, 2003), Delaware (Gallons, Toensmeyer, Bacon, & German

**Figure 1. Study Area**



1997), and California (Wolf, 1997; Wolf, Spittler, & Ahern, 2005). However, these studies do not examine price premiums as a function of geographic interval, which may play an important role in the financial success of a local food value chain.

### Applied Research Methods

A survey instrument was developed following the payment card contingent valuation approach applied in a similar study by Loureiro and Hine (2002), which used a similar survey instrument in a study of local, organic, and GMO-free<sup>1</sup> potatoes in Colorado. The payment card contingent valuation approach is a stated preference measure developed by Mitchell and Richard (1981) to maintain the advantages of direct questioning, while overcoming the starting point bias in bidding games by providing ranges or increments.<sup>2</sup> While this method is

<sup>1</sup> Free of genetically modified organisms

<sup>2</sup> Methods used to measure WTP can be categorized by how they measure a consumer's preference. Revealed preference measures such as laboratory and field experiments have the benefit of securing information on consumer's actual actions but are generally prohibitively costly to implement in any large scale. Stated preference measures such as surveys are subject

used extensively to elicit WTP, it has shortcomings. These include elicitation effects presumably due to the method's hypothetical nature, though Champ and Bishop (2006) also find elicitation effects when individuals make real donations. Boyle and Bishop (1988) find that respondent valuation can be influenced by the interviewer, while Kahneman and Knetsch (1992) argue that contingent valuation methods elicit moral satisfaction instead of economic value. While subject to these and other shortcomings, the compre-

hensive literature review by Martinez et al. (2010) demonstrates that contingent valuation is an accepted and widely adopted approach for empirical analysis of local food demand.

The survey instrument was designed to collect consumers' WTP for locally grown fresh produce at different geographic intervals. The geographic intervals used in the survey are the multistate level, state level, multicounty level, and county level. A premium for food items produced in-state has been demonstrated by Giraud, Bond, and Bond (2005). Schneider and Francis (2005) demonstrate a price premium for food produced in-county. Specifically, our survey used the following intervals: the Midwest, Indiana, the Tri-State, and Vanderburgh County, Indiana. The Tri-State is a 30-county region at the Illinois-Indiana-Kentucky intersection consisting of 10 Illinois counties, 11 Indiana counties, and nine Kentucky counties. The term is commonly used in local media and by local residents. Figure 1 shows the study area including

to various shortcomings, but are generally less costly and easier to implement.

the city in which the survey was administered, Evansville, Indiana, as indicated by the black star. The city is located in Vanderburgh County, shown in red. Finally, the 30 county Tri-State region is shown in a grey cross-hash pattern. These geographic intervals were chosen over numerical intervals, such as mileage figures, to help inform policies regarding the promotion and marketing of local food systems.

Our survey was administered using the intercept method in Evansville, Indiana, the principal city of Vanderburgh County, Indiana, in November 2010. Surveys were conducted at locations and events that attracted residents from throughout the region, including the downtown museum and prior to the local holiday parade. This approach was successful in attracting respondents from 42 unique zip codes, with 63.6% of respondents residing in Vanderburgh County, 17.6% residing outside Vanderburgh County but within the Tri-State, and 18.7% not willing to identify their zip code. A total of 482 surveys were collected, resulting in an estimated response rate of 40%.<sup>3</sup>

The sociodemographic composition of the survey is comparable to the 2005–2009 American Community Survey data for the Evansville MSA as seen in table 1. The percentage of female respondents to the present survey was 56.6%, compared with 52.9% for the American Community Survey. The percent of respondents making between US\$25,000 and US\$99,000 annually was 53.7% in the current survey, compared with 56.8% for the American Community Survey. Other demographic data was collected, including the presence of children in the household, age group, education level, total household income, and travel time to the food market that the subject visits most often.

While the sample is not truly random, the demographics of the respondents are similar in a number of respects to the published demographics

of the region. The comparison suggests that while there was a similar age and percent female participation, our respondents were more educated, wealthier, and more likely to have children than the MSA as a whole. We believe this is likely due to the particular locations and events during which the data was collected. The literature suggests that this is a common shortcoming of the intercept surveying method (McGraw, McKinlay, Crawford, Costa, & Cohen, 1992; Word, 1992).

**Table 1. Demographic Variables**

Variable and Definition	Respondents	2005–2009 American Community Survey
<b>Gender</b>		
Female	56.6%	52.9%
Male	40.0%	47.1%
Prefer not to respond	3.4%	n/a
<b>Age (at least 15 years old)</b>		
15 to 24	22.0%	18.5%
25 to 34	21.0%	17.4%
35 to 44	20.8%	20.1%
45 to 64	27.1%	28.2%
65+	9.1%	15.8%
<b>Children in the household</b>	44.2%	29.4%
<b>Income (all in US\$)</b>		
Less than \$25,000	19.9%	35.4%
\$25,000 to \$40,000	21.2%	20.3%
\$41,000 to \$65,000	19.0%	20.6%
\$66,000 to \$99,000	13.5%	15.9%
\$100,000+	13.7%	7.8%
Prefer not to respond	12.7%	n/a
<b>Education</b>		
High school or less	26.0%	51.6%
Some college	28.6%	23.0%
Associates degree	11.1%	7.6%
BA/BS degree	25.6%	11.8%
Graduate degree	8.7%	6.0%

<sup>3</sup> The response rate was estimated from postcollection interviews with the survey collectors, who estimated the percentage of persons who accepted out of the total asked to participate.

**Table 2. WTP category** (all values in US\$ cents, where 100 cents = 1 US\$)

Qualitative Variable	Definition
0	None
1	< 5 cents
2	5–9 cents
3	10–14 cents
4	15–19 cents
5	> 20 cents

“grown in the Tri-State,” and “grown in Vanderburgh County.”

The premium, in cents per pound, was then qualitatively categorized on a rating scale ranging from 0 to 5.<sup>4</sup> Table 2 shows the quantitative interpretation of each category. A higher category corresponds to a higher WTP for locally grown fresh produce.

The left column of table 3 provides a summary of the qualitative WTP responses. The mean WTP

**Table 3. Willingness To Pay Summary**

Category	# of Observations	Mean	p-values of two-sided t-tests					
			“Grown Locally”	Midwest	Indiana	Tri-State	Vanderburgh County*	Vanderburgh County**
“Grown Locally”	465	2.00	—	<0.01	0.33	0.86	0.28	0.21
Midwest	465	1.67		—	0.01	<0.01	<0.01	<0.01
Indiana	465	1.90			—	0.25	0.04	0.03
Tri-State	463	2.01				—	0.37	0.23
Vanderburgh County*	459	2.10					—	0.70
Vanderburgh County**	310	2.15						—

\* Asked of all respondents; \*\* Asked of Vanderburgh County residents only

## Results

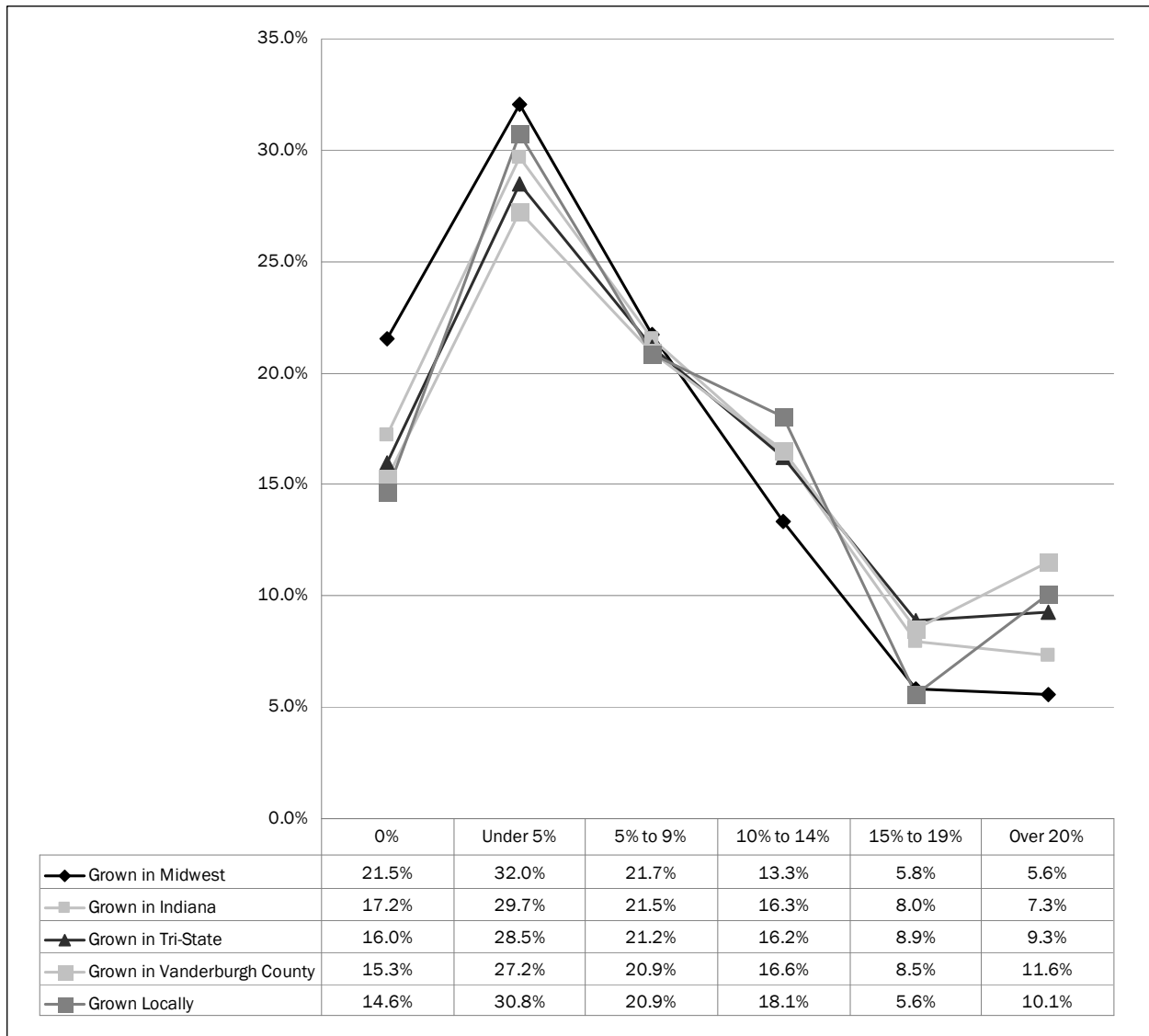
Our survey instrument was designed to examine to what degree the price premium for locally sourced fresh produce varies by geographic interval. The survey instrument asked respondents to ponder the following scenario:

Assuming fresh produce was priced a \$1.00 per pound, how much of a premium would you be willing to pay (in cents per pound) for fresh produce containing each of the following characteristics?

The characteristics were divided into two parts. First, the respondent was asked the question in regards to the generic description, “grown locally.” After the respondent responded, he or she was then presented with the four geographic intervals: “grown in the Midwest,” “grown in Indiana,”

suggests that as the geographic interval for local production shrinks, the average price premium increases. Also of note is that the generic term “grown locally” appears most closely aligned to the Tri-State value, suggesting that the typical geographic interval related to “local” is the multicounty or regional level. Interestingly, the WTP at the Vanderburgh County level did not deviate significantly when the results from respondents residing inside the county were isolated.

<sup>4</sup> The survey instrument used a rating scale that ranged from 1 to 6 in *decreasing* order of WTP, i.e., 1 represented a WTP of more than 20 cents per pound, 2 represented a WTP of 15–19 cents per pound, etc. For the purpose of the analysis we converted this to a more standard representation where the WTP increases with an increase in the categorical variable, using a scale of 0 to 5.

**Figure 2. Willingness To Pay Results**

The right columns of table 3 show p-values of a t-test to measure the statistical difference in the mean across geographic intervals. Note that “Midwest” is significantly different from all other categories with a p-value of less than 0.05. Additionally, the differences between “Indiana” and “Vanderburgh County” is statistically significant across all respondents (p-value = 0.04)

and when the respondents are limited to only Vanderburgh County residents (p-value = 0.03).<sup>5</sup>

<sup>5</sup> Since the Vanderburgh County geographic interval is the only interval with well defined boundaries, we thought it would be prudent to show how the mean WTP varies with respondents who live within Vanderburgh County. This is the last row in table 3. To this end, we used zip codes, which were asked of the respondents, to identify Vanderburgh County residents. The zip codes used for Vanderburgh County, IN, are 47701-47750. All zip codes are within the border of Vanderburgh County except for 47725 (99.3% of zip code is within county border) and 47712 (88.5%). The zip codes



geographic intervals, as well as the generic “grown locally” category. Roughly 15% to 20% of respondents do not express a price premium for local produce, and the modal response category (under 5¢ premium) accounts for 27% to 32% of responses. The smallest geographic interval, “grown in Vanderburgh County,” ranks highest in only the top WTP category, above 20¢ premium.

In sum, the results suggest that WTP for locally grown fresh produce does not deviate substantially across the definitions of “local,” though mean WTP increases as the geographic interval shrinks. Previous studies of local foods systems suggest that marketing costs can present obstacles to the expansion of local food sales (Biermacher et al., 2007). The transaction costs associated with securing locally produced food items at a consistent quality, particularly fresh produce, may also substantially limit the development of local food value chains. The survey results suggest that, although there is some expected price premium for tighter definitions of “local” foods, the price premiums do not vary substantially from large, multistate definitions (Midwest) to small political boundaries (Vanderburgh County). In other words, the costs associated with developing more geographically concentrated food systems, or “foodsheds” as termed by Kloppenburg, Hendrickson, and Stevenson (1996), may not be balanced by higher price premiums received. Instead, food distributors may expect similar premiums for “local” foods drawn from larger geographic areas.

### Conclusions

The local foods movement is the expression of a number of food, environmental, and health concerns, including concerns about the environmental impacts of food distribution networks, a better understanding of food origins, and the financial support of local farmers. In recent years, the movement has been the subject of best-selling books, popular media stories, and public policy. One important component of developing local food systems is identifying consumers’ WTP for

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47639 (16.2%) and 47633 (2.6%) are found in the county, but are not included.

locally produced food products. A number of previous studies have shown that consumers are willing to pay a premium for “local” foods, including such food items as dairy (Best & Wolfe, 2009), pork (Grannis & Thilmany, 2002), and strawberries (Hinson & Bruchhaus, 2005).


This study examines consumers’ WTP for fresh produce using a survey of 482 area residents in Evansville, Indiana. The survey instrument was designed to test the differences in premiums based on five geographic definitions of “local” foods. As noted in the literature, there is not a consensus on what defines local foods (Martinez et al., 2010). We, therefore, elicit consumers’ WTP for a generic “grown locally” designation, as well as four geographic intervals, including Midwest, Indiana, Tri-State Region, and Vanderburgh County (the location of Evansville, Indiana). Although a number of studies examine consumers’ WTP for fresh produce, the relationship between price premiums and geographic scale have not been well studied.

Roughly 85% of respondents offered a positive WTP for fresh produce under the generic “grown locally” moniker. This percent increases as the geographic scale shrinks from Midwest (78%) to county level (85%). In addition, the mean price premium increases as the geographic interval shrinks. This suggests that consumers may place a higher premium on foods under tighter definitions of “local.” However, examining the distribution of WTP for each definition, there does not appear to be a substantial variation in price premiums.

This new information may be useful for parties interested in developing local food marketing programs or establishing new food distribution infrastructure. For example, the survey results suggest that price premiums do not vary substantially when “local” is defined as a multistate region or county. However, the cost of sourcing locally grown fruits and vegetables from small geographic areas may be prohibitively expensive. Local food retailers, then, may expect similar revenues with substantially lower costs when marketing “local” foods from larger multistate regions. This

potentially could improve the profitability of a local food system and ensure economic sustainability.

In addition, the discovery may be informative to new policies that address the local food movement. By better understanding consumers perceptions of “local,” policy-makers will be able to improve efficiency of program benefits with respect to location. Given that consumers tolerate similar price premiums across the definitions of “local,” effective policies can be designed that incorporate foods from a larger area in a more economically sustainable fashion.

This study examines price premium variations for different geographic definitions of “local,” using a broad category of locally produced foods, namely, *fresh produce*. While this study found that consumers do not appear to exhibit substantial variation, the results of this study may not apply to *each* locally produced food. In other words, there may exist a substantial premium for *specific* locally produced foods. Therefore, future research is required regarding the degree to which this phenomenon holds true for specific food items. 

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### References

- Bagdonis, J. M., Hinrichs, C. C., & Schafft, K. A. (2009). The emergence and framing of farm to school initiatives: Civic engagement, health, and local agriculture. *Agriculture and Human Values*, 26, 107–119. <http://dx.doi.org/10.1007/s10460-008-9173-6>
- Best, M. J., & Wolfe, K. L. (2009). A profile of local dairy consumers in the Southeast and the potential for dairies to market value-added products locally. *Journal of Food Distribution Research*, 40, 22–31.
- Biermacher, J., Upson, S., Miller, D., & Pitman, D. (2007). Economic challenges of small-scale vegetable production and retailing in rural communities: An example from rural Oklahoma. *Journal of Food Distribution Research*, 38(3), 1–13.
- Boyle, K. J., & Bishop, R. C. (1988). Welfare measurements using contingent valuation: A comparison of techniques. *American Journal of Agricultural Economics*, 70(1), 20–28. <http://dx.doi.org/10.2307/1241972>
- Brooker, J. R., & Eastwood, D. B. (1989). Using state logos to increase purchases of selected food products. *Journal of Food Distribution Research*, 20, 175–183.
- Brown, C. (2003). Consumers’ preferences for locally produced food: A study in southeast Missouri. *American Journal of Alternative Agriculture*, 18(4), 213–224. <http://dx.doi.org/10.1079/AJAA200353>
- Champ, P. A., & Bishop, R. C. (2006). Is willingness to pay for a public good sensitive to the elicitation format? *Land Economics*, 82(2), 162–173.
- Conner, D. S., Knudson, W. A., Hamm, M. W., & Peterson, H. C. (2008). The food system as an economic driver: Strategies and applications for Michigan. *Journal of Hunger and Environmental Nutrition*, 3(4), 371–383. <http://dx.doi.org/10.1080/19320240802528849>
- Conner, D. S., & Levine, R. (2007). Circles of association: The connections of community-based food systems. *Journal of Hunger and Environmental Nutrition*, 1(3), 5–25. [http://dx.doi.org/10.1300/J477v01n03\\_02](http://dx.doi.org/10.1300/J477v01n03_02)
- Darby, K., Batte, M. T., Ernst, S., & Roe, B. (2008). Decomposing local: A conjoint analysis of locally produced foods. *American Journal of Agricultural Economics*, 90(2), 476–486. <http://dx.doi.org/10.1111/j.1467-8276.2007.01111.x>
- Durham, C. A., King, R. P., & Roheim, C. A. (2009). Consumer definitions of “locally grown” for fresh fruits and vegetables. *Journal of Food Distribution Research*, 40, 56–62.
- Gallons, J., Toensmeyer, U. C., Bacon, J. R., & German, C. L. (1997). An analysis of consumer characteristics concerning direct marketing of fresh produce in Delaware: A case study. *Journal of Food Distribution Research*, 28, 98–106.
- Giraud, K. L., Bond, C. A., & Bond, J. J. (2005, October). Consumer preferences for locally made specialty food products across Northern New England. *Agricultural and Resource Economics Review*, 34(2), 204–216. Available at <http://purl.umn.edu/10231>

- Grannis, J., & Thilmany, D. (2002). Marketing natural pork: An empirical analysis of consumers in the Mountain Region. *Agribusiness*, 18(4), 475–489. <http://dx.doi.org/10.1002/agr.10029>
- Guptill, A., & Wilkins, J. L. (2002). Buying into the food system: Trends in food retailing in the US and implications for local foods. *Agriculture and Human Values*, 19(1), 39–51. <http://dx.doi.org/10.1023/A:1015024827047>
- Hand, M. (2010, December). Local food supply chains use diverse business models to satisfy demand. *Amber Waves*. Available at <http://www.ers.usda.gov/AmberWaves/December10/Features/SupplyChains.htm>
- Hand, M., & Martinez, S. (2010). Just what does local mean? *Choices*, 25(1). Available at <http://www.choicesmagazine.org>
- Hinson, R. A., & Bruchhaus, M. N. (2005). Louisiana strawberries: Consumer preferences and retailer advertising. *Journal of Food Distribution Research*, 36(1), 86–90. Available at <http://purl.umn.edu/26772>
- Ikerd, J. (2005). Eating local: A matter of integrity, presentation at *The Eat Local Challenge* kickoff event, Portland, Oregon, June 2, 2005.
- Kahneman, D., & Knetsch, J. L. (1992). Valuing public goods: The purchase of moral satisfaction. *Journal of Environmental Economics and Management*, 22, 57–70. [http://dx.doi.org/10.1016/0095-0696\(92\)90019-S](http://dx.doi.org/10.1016/0095-0696(92)90019-S)
- Kloppenborg, J., Hendrickson, J., & Stevenson, G. W. Coming in to the foodshed. *Agriculture and Human Values*, 13(3), 33–42. <http://dx.doi.org/10.1007/BF01538225>
- Lea, E., Phillips, J., Ward, M., & Worsley, A. (2006). Farmers' and consumers beliefs about community supported agriculture in Australia: A qualitative approach. *Ecology of Food and Nutrition*, 45(2), 61–86. <http://dx.doi.org/10.1080/03670240500530592>
- Lev, L., Brewer, L., & Stephenson, G. (2003). *How do farmers' markets affect neighborhood businesses?* Oregon Small Farms Technical Report No. 16, Small Farms Extension Program, Oregon State University, Corvallis, Oregon.
- Loureiro, M. L., & Hine, S. (2002). Discovering niche markets: A comparison of consumer willingness to pay for local (Colorado grown), organic, and GMO-free products. *Journal of Agricultural and Applied Economics*, 34(3), 477–487.
- Marsden, T., Banks, J., & Bristow, G. (2000). Food supply chain approaches: Exploring their role in rural development. *Sociologica Ruralis*, 40, 424–438. <http://dx.doi.org/10.1111/1467-9523.00158>
- Martinez, S., Hand, M., Da Pra, M., Pollack S., Ralston, K., Smith, T., Vogel, S., Clark, S., Lohr, L., Low, S., & Newman, C. (2010). *Local food systems: Concepts, impacts, and issues*. Economic Research Report No. 97, United States Department of Agriculture Economic Research Service, Washington, D.C.
- McGraw S. A., McKinlay, J. B., Crawford, S. A., Costa, L. A., & Cohen, D. L. (1992). Health survey methods with minority populations: Some lessons from recent experience. In D. M. Becker, D. R. Hill, J. S. Jackson, D. M. Levine, F. A. Stillman, S. M. Weiss (Eds). *Health behavior research in minority population: Access, design, and implementation* (pp. 149–167). Washington, D.C.: National Institutes of Health.
- Mitchell, R. C., & Richard, C. T. (1981). An experiment in determining willingness to pay for national water quality improvements. *Resources for the Future*. Draft report to U.S. Environmental Protection Agency, Washington D.C.
- Moore, L. V., Diez Roux, A. V., Nettleton, J. A., & Jacobs, D. R. (2008). Associations of the local food environment with diet quality: A comparison of assessments based on surveys of geographic information systems. *American Journal of Epidemiology*, 167(8), 917–924. <http://dx.doi.org/10.1093/aje/kwm394>
- Morland, K., Wing, S., & Roux, A.D. (2002). The contextual effect of the local food environment on residents' diets: The atherosclerosis risk in communities study. *American Journal of Public Health*, 92, 1761–1767.
- Roininen, K., Arvola, A., & Lahteenmaki, L. (2006). Exploring consumers' perceptions of local food with two different qualitative techniques: Laddering and word association. *Food Quality and Preference*, 17, 20–30. <http://dx.doi.org/10.1016/j.foodqual.2005.04.012>
- Ross, N. J., Anderson, M. D., Goldberg, J. P., Houser, R., & Rogers, B. L. (1999). Trying and buying locally grown produce at the workplace: Results of marketing intervention. *American Journal of Alternative Agriculture*, 14, 171–179. <http://dx.doi.org/10.1017/S0889189300008353>

- Schneider, M. L., & Francis, C. A. (2005). Marketing locally produced foods: Consumer and farmer opinions in Washington County, Nebraska. *Renewable Agriculture and Food Systems*, 20, 252–260. <http://dx.doi.org/10.1079/RAF2005114>
- Selfa, T., & Quazi, J. (2005). Place, taste, or face-to-face? Understanding producer-consumer networks in “local” food systems in Washington State. *Agriculture and Human Values*, 22, 451–464. <http://dx.doi.org/10.1007/s10460-005-3401-0>
- Starr, A., Card, A., Benepe, C., Auld, G., Lamm, D., Smith, K., & Wilken, K. (2003). Sustaining local agriculture: Barriers and opportunities to direct marketing between farms and restaurants in Colorado. *Agriculture and Human Values*, 20, 301–321. <http://dx.doi.org/10.1023/A:1026169122326>
- Swenson, D. (2009). *Investigating the Potential Economic Impacts of Local Foods for Southeast Iowa*. Leopold Center for Sustainable Agriculture. Ames, IA
- Vogt, R. A., & Kaiser, L. L. (2008). Still a time to act: A review of institutional marketing of regionally-grown food. *Agriculture and Human Values*, 25, 241–255. <http://dx.doi.org/10.1007/s10460-007-9106-9>
- Wolf, M. M. (1997). A target consumer profile and positioning for promotion of the direct marketing of fresh produce: A case study. *Journal of Food Distribution Research*, 28, 11–17.
- Word, C. O. (1992). Cross-cultural methods for survey research in black urban areas. In A. K. H. Burlew, W. C. Banks, H. P. McAdoo, & D. A. Azibo (Eds.). *African American psychology* (pp. 28–42). Newbury Park, California: Sage Publications.
- Wolf, M. M., Spittler, A., & Ahern, J. (2005). A profile of farmers’ market consumers and the perceived advantages of produce sold at farmers’ markets. *Journal of Food Distribution Research*, 36, 192–201.
- Zepeda, L., & Li, J. (2006). Who buys local food? *Journal of Food Distribution Research*, 37, 1–11.

## Case study: A systems analysis of cattle morbidity in a niche market beef cooperative

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### Abstract

Country Natural Beef (CNB) is a rancher-owned, niche market beef cooperative. In fall 2008, CNB experienced an increase in cattle morbidity at the feedlot. With a reduced number of animals qualifying for the CNB program, the possibility of being unable to meet customer demand became a critical concern. Consequently, CNB proactively initiated an internal investigation to identify the underlying reasons and key risk factors that contributed to the increase in morbidity. An analysis was conducted to determine size and scope of the problem,

identify key risk factors, and provide recommendations for supply chain improvement. A sample of 42 CNB member ranchers, CNB employees, and personnel from the feedlot where CNB cattle are finished were interviewed to provide a better understanding of the ranchers' behavior, production chain structures, management protocols, and company policies. Recommendations to reduce morbidity rates included: (1) background all cattle, (2) institute internal process controls to include auditing the accounts at regular intervals, and (3) amend the policies that allow the shift in financial responsibility of morbidity from individual ranchers to the organization as a whole. Implementing these recommendations should minimize feedlot morbidity in the CNB program and make the program more viable in the marketplace by reducing fluctuations in supply. Similar niche beef production programs should consider their entire production chain in order to maintain a balance between the demand and supply and minimize the cost of production.

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## Keywords

animal health, niche beef production, producer cooperative, supply chain

## Introduction

Previous studies have indicated that American consumers are concerned about food safety (Caswell, 1998). Since 2000, consumer confidence in beef safety has remained relatively stable, ranging from 60% to 91% (McCarty, 2010). Beef consumers are most concerned with microbial load of the product and pesticide use to control parasites, followed by hormone and antibiotic treatments (McCarty, 2010). This suggests that beef consumers want information about animal production practices to base purchasing decisions on; consequently, additional niche markets that focus on food production practices have been created. The USDA regulates food product labels as “natural,” “no hormones,” “no antibiotics,” or “organic” (USDA, 2010). Although demand for these niche market products has slowed during the recent economic downturn, it is expected that natural and organic products will grow at a rate of 13% and 7%, respectively, between 2010 and 2017 as the economy recovers (Nutrition Business Journal, 2010). Sales of this broad category of foods increased by 1.8% during 2009, exceeding US\$143 billion in sales (Nutrition Business Journal, 2010). These general trends suggest that some consumers are more aware of the way their foods are produced and are willing to pay a premium for foods that are produced in a manner that they perceive to be a healthy and ecologically sustainable.

Country Natural Beef (CNB) is a rancher-owned cooperative with its headquarters in Oregon and with member ranches in Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, Texas, Washington, and Wyoming ([www.countrynaturalbeef.com](http://www.countrynaturalbeef.com)). CNB was formed as a beef marketing cooperative in 1986 by 14 families who had a vision of protecting ranchlands and preserving rural family culture by directly linking ranchers and consumers. CNB cattle are raised in a humane manner (as certified by third-party auditors), are never fed

animal-derived feedstuffs, and never receive antibiotics or hormones. Therefore, CNB cattle supply beef to a niche market.

Beef from animals that become sick and receive therapeutic antibiotics no longer qualify for some niche markets that CNB supplies. Consequently, antibiotic treated animals would be removed from the program. During the third quarter of 2008, the number of cattle removed from the program due to sickness (referred to in cattle production as *morbidity*) increased to 7.3%, a three-fold increase over the previous four-year average of 2.4%. Morbidity increased CNB's production costs for 2008 and had the potential to disrupt the CNB beef supply chain. With a reduced number of animals qualifying for the CNB program, there was a possibility that supply would not meet consumer demand. This led CNB upper management to initiate an internal investigation to identify the underlying reasons and key risk factors that contributed to the increase in morbidity. This introspection would assist in identifying the weaknesses of the present system, thus repairing and rejuvenating the system to live up to the expectations of customers in the future.

## Country Natural Beef Supply Chain

It is mandatory for the ranchers in the CNB program to own and raise cattle from birth. For the first 12 to 18 months after birth, cattle from member ranches are raised on native range, seeded pastures, and hay meadows. To ensure a continuous supply of feeder cattle throughout the year, some ranchers use winter grow lots and feed a ration usually based on silage, hay, and corn before shipping cattle to the BeefNorthWest (BNW) feedlot. CNB member ranches are audited by the authorities of Food Alliance, a national nonprofit organization that certifies sustainable agricultural practices.

All cattle in the CNB program are finished at the BNW feedlot in Boardman, Oregon. The cattle arrive at BNW weighing approximately 800 lbs. (363 kg) and finish weighing between 1,100 lbs. and 1,300 lbs. (499 and 590 kg) (D. Probert of CNB, personal communication, March, 2009). The

cattle are fed for 90 days, in comparison to the industry average of 150 to 180 days (Muth et al., 2005). Cattle are fed a 100% vegetarian diet. To comply with CNB protocols, antibiotics and ionophores are not added to the rations, and cattle are not implanted with growth hormones. Careful visual observations of live cattle are used to sort cattle for slaughter. Each ranch is individually responsible for feed, yardage, and processing fees incurred by their lots of cattle (W. Killion of BNW, personal communication, March 2009).

Cattle in the CNB program are humanely slaughtered and fabricated into retail cuts and ground beef products at a beef packing plant in Toppenish, Washington. Cattle are slaughtered on a weekly basis. Those carcasses that meet the CNB criteria for meat quality and yield grade are sorted and selected for fabrication. The beef is then packaged and sold as CNB beef in retail stores such as Whole Foods and New Seasons and in restaurants such as Burgerville.

### **Current Organization Structure**

Each CNB member ranch holds a seat on the board of directors and has one vote. A management team is elected annually and consists of nine CNB members. A chairman and vice chairman are elected from the management team members. Three teams, the marketing and sales team, the financial team, and the production team, are in charge of different aspects of CNB operations.

CNB's marketing team maintains the relationships with CNB's retail customers and also develops new products. The marketing team maintains the CNB website, creates promotional materials, and facilitates in-store demonstrations to develop the relationship between meat cutters and consumers. The team is responsible for filling weekly customer orders and maintaining the meat inventory balance. This team is also responsible for scheduling cattle on feed at the BNW feedlot. Scheduling occurs 18 months prior to the actual slaughter date to maintain proper supply inventories and flow of cattle from birth to finish.

CNB's financial team handles all accounts payable,

accounts receivable, and payments to ranchers. Additionally, it maintains all carcass and profitability data for individual ranches and the entire CNB cooperative.

CNB's production team schedules and manages the flow of cattle from member ranches to the BNW feedlot. The production team works closely with the marketing team and the feedlot to schedule and make any necessary adjustments to cattle entering and leaving the feedlot at the correct weight and time while also meeting retail customer demands for inventory. Other duties include coordinating new member recruitment, ensuring age and source verification, and fielding member questions and concerns. This team also generates a CNB newsletter and ensures that insurance needs are fulfilled.

### **Applied Research Methods**

An assessment tool was developed and delivered via personal interview to determine if management practices on CNB member ranches affected morbidity levels in the feedlot. There were 117 members in the CNB cooperative. Sixty ranchers were randomly selected to be interviewed; only 42 members participated in the project. Eighty-eight percent of these ranchers were from Oregon. Each rancher was asked the same questions regarding ranch location, cattle health, nutrition, genetics, and general management practices. Rancher interviews were conducted both in person (n=21) and telephonically (n=21) in February and March 2009. Information obtained through the interview process was used to identify potential risk factors that could affect cattle health. Management and staff at CNB and BNW were also interviewed to provide an understanding of the production chain process after cattle leave the ranch. The study protocol was approved by the university's Institutional Review Board.

Data for all CNB member ranches between 2004 and 2008 was compiled to evaluate morbidity levels in the feedlot. This data consisted of a rancher's lot number, number of head per lot, date the lot entered the feedlot, and the number of morbid cattle per lot. Morbidity levels ranged from 0% to 56%, with a standard deviation of 7%. Information

obtained through the interview process was combined with this CNB data set.

Based on the interview, health management information was categorized into two topics, backgrounding method and vaccination protocol, and incorporated with the five-year data set. *Backgrounding* refers to management practices that are designed to enhance the immune system, improve nutritional status, and reduce post-weaning stress of calves. This is achieved through confining newly weaned calves to an enclosed space and exposing them to eating out of bunks. For this study, cattle were categorized into three different backgrounding protocols consisting of (1) no backgrounding — cattle go straight from weaning to grass; (2) backgrounding for approximately 45 days, then turning out to grass; and (3) backgrounding on the ranch or in a custom background yard for approximately 45 days, then going straight to the feedlot. Cattle in each of the three methods were raised to approximately 800 lbs., taken to BNW for finishing, and slaughtered approximately 90 days later when they weighed between 1,100 and 1,300 lbs. Cattle were also categorized based on vaccination protocol prior to entering the feedlot. Cattle were classified as not vaccinated (0 vaccinations) or vaccinated (1 or more vaccinations). The experimental unit was lot of cattle. Each lot contained numerous cattle that were used to calculate percent morbidity per lot.

A generalized linear model was used to evaluate morbidity levels for the entire CNB program between 2004 and 2008. A similar generalized linear model was used to analyze the effect backgrounding

method and vaccination protocols had on morbidity of the cattle at the interviewed ranchers. Year and quarter were included in the model to determine if year and/or season affected cattle sickness. The generalized linear model with logistical regression for binomial counts was performed using Pearson's chi-square and adjusted for overdispersion.

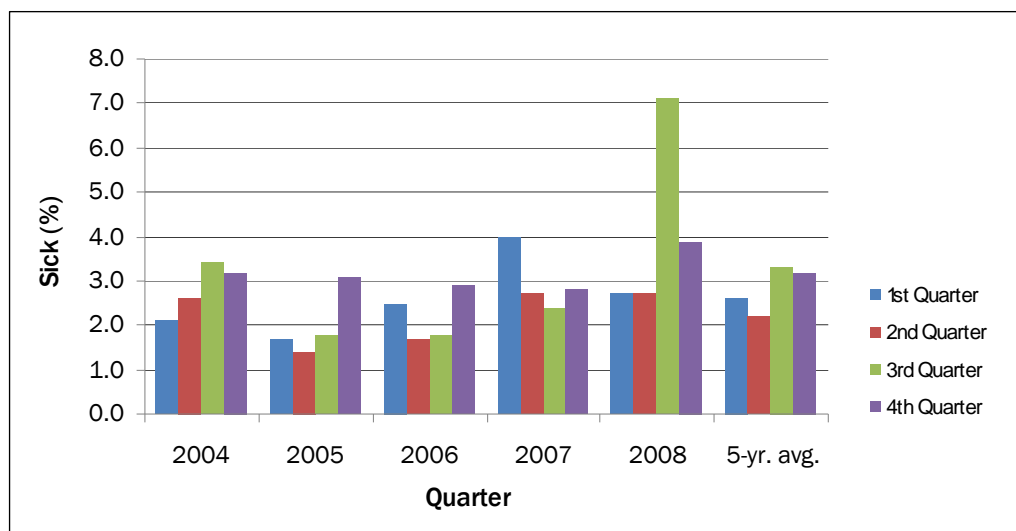
## Results and Discussion

### Overall Morbidity

The results from 2004 through 2008 indicate that a total of 216,325 head of cattle went through CNB's program. The total number of sick cattle during this five-year period was 6,277 head. The average morbidity rate was 2.9%, which is much lower than both the national average of 15% (Nixon, 2007) and the conventional BNW cattle, which had a range of 15% to 18% morbidity (W. Killion, Boardman, Oregon, personal communication, February 2009). The morbidity rate of CNB cattle indicate that management practices of CNB ranchers are better than those of average ranchers.

The results obtained during the third quarter of 2008 indicates an increase in morbidity to 7.3% from a previous four-year third quarter average of 2.4%, which garnered the attention of CNB

**Figure 1. Country Natural Beef Morbidity Levels (sick, %) by Quarter for the Years 2004 to 2008 and a Five-year Average by Quarter**





leadership (figure 1). Upon investigation, one explanation for this finding was that the feedlot, BNW, had a two-week delay in processing newly received cattle (W. Killion, Boardman, Oregon, personal communication, February 2009). Under normal circumstances, cattle were processed within a 24-hour period upon arrival at the feedlot. The backlog in processing caused a delay in the incoming cattle receiving their vaccinations in a timely manner. This delay may have put cattle at risk for morbidity due to being commingled and exposed to pathogens without the proper immunity obtained through vaccination. Typical feedlot receiving protocols recommend vaccination within 48 hours of arrival; however, recent literature states that there is no production loss or economic cost associated with a delay in vaccination (Richeson et al., 2008).

It is also important to note that there was an interaction between year and quarter ( $P < 0.01$ ) for cattle morbidity; this was likely due to uncontrollable variables, such as climate and weather.

*Interviewed Ranchers.* The 42 ranchers accounted for 972 lots and 120,379 head of cattle, which constituted over half of the CNB program cattle between 2004 and 2008. The total number of sick cattle among the 972 lots was 3,568 head. The overall morbidity level of cattle from these observations was 3.0%, indicating the morbidity level of the sample was representative of the cattle fed in the program between 2004 and 2008 (table 1).

Cattle backgrounded for approximately 45 days

and then returned to grass had a 56% lower chance of being sick than cattle not backgrounded after weaning and sent straight to grass ( $X^2=36.18$ ,  $P < 0.01$ ). Likewise, cattle that were backgrounded on the ranch or in a custom yard post-weaning and sent straight to the feedlot had a 39% lower chance of being sick than cattle that were not backgrounded ( $X^2=19.13$ ,  $P < 0.01$ ). Reduced levels of morbidity are seen with backgrounded cattle because they were trained to eat from a bunk, were confined and exposed to other animals, and acquire immunity through exposure (D. Grotelueschen, Phizer, Gering, Nebraska, personal communication, April 2009). Upon arrival to the feedlot, cattle that have been backgrounded are not naïve to their new environment. Results from this study support the need for backgrounding approximately 45 days to reduce morbidity in the feedlot.

Recommended vaccination procedures for ranchers include an initial vaccination followed by a booster at weaning and 2 to 4 weeks post-weaning. Although the literature strongly supports the efficacy of vaccination programs (Duff & Galyean, 2007), in this study there was no difference in morbidity between cattle that did and did not receive vaccines ( $P > 0.20$ ) prior to arrival at the feedlot. Because only one rancher chose not to vaccinate, a statistical significance could not be detected in this study due to the small sample size.

*Cost.* If CNB cattle became sick enough to require treatment with antibiotics, they were removed from their original lot, treated for the illness, commingled in a separate pen, and given a new lot number.

**Table 1. Summary of Country Natural Beef (CNB) Program Cattle Morbidity Between 2004 and 2008**

	All CNB cattle	Interviewed Ranchers		
		No background	Background, then grass	Background, then feedlot
Number of lots	2,188	271	358	343
Number of cattle	216,325	36,993	38,211	45,175
Number of sick cattle	6,277	1,269	981	1,318
Percent Morbidity	2.9	3.4	2.6	2.9

Because these animals were treated with antibiotics, they no longer qualified for the CNB program. Thus, these cattle were finished in a traditional manner (including nontherapeutic antibiotics, ionophores, and growth promoting implants) and marketed conventionally. To separate costs, a new lot number (Lot 9000) was formed. When cattle were taken out of the CNB program and put into Lot 9000, CNB purchased the cattle from the ranch owner based on a discounted conventional market price. The loss for cattle in Lot 9000 ranged from \$26 to \$338 per head. In addition to medication costs, morbidity in feedlot cattle likely reduced profitability due to lower rates of gain and a decrease in carcass quality (Gardner, Dolezal, Bryant, Owens, & Smith, 1999; Roeber et al., 2001). The total loss attributed to Lot 9000 cattle for the 2008 fiscal year was US\$215,000. This was an average of US\$200 per sick animal. When this loss was distributed over the healthy cattle, it cost each member an average US\$5.00 per head to cover the financial loss associated with morbid cattle.

Through the interview process, it was evident that individual ranchers generally assumed that if their cattle were healthy when they left their ranch, sickness at the feedlot was a result of mismanagement further down the production line. When sickness occurred, ranchers often called the production office and CNB management team to discuss problems and potential solutions that would result in healthier cattle at the feedlot. Organizationally, CNB's response to increased morbidity was to form investigative committees charged with finding solutions, such as the development of Lot 9000. These solutions, guided by the unwritten rule that CNB takes care of its members and helps each other with problems, shifted the cost of morbidity from individual ranchers to the organization as a whole.

The CNB member ranches and BNW joined together for a win-win partnership, but the increased morbidity caused the partners to view themselves as isolated adversaries rather than parts of a whole functioning system. Though not organizationwide or true of all members, this viewpoint

began to infiltrate discussions, further impeding progress to find causes and solutions relevant to the entire production chain.

### **Process Verified Observations**

The interview process revealed no evidence of standardized process verified control measures in place for CNB suppliers of cattle to the BNW feedlot. Though Food Alliance does audit member ranches for safe and fair working conditions, humane animal treatment, and environment-related practices, no internal or external audits existed for any standardized management protocols. Likewise, there was no whole herd disease testing, record of adherence to beef quality assurance guidelines, supplier training, or evidence of membership record-keeping. CNB recommended that members use an approved list of vaccines and one of two vaccination protocols, but there was no evidence these protocols were followed.

### **Recommendations**

*Recommendation 1: Background Cattle for at Least 45 Days.* Previous cattle morbidity research indicates that a major risk factor is backgrounding length and method. Cattle backgrounded for 45 days or greater have consistently shown lower levels of morbidity (Mathis, Loest, & Carter, 2008). Cattle that were backgrounded for 45 days or greater (on ranch or custom background yard) before being turned out on grass were less likely to become sick than cattle not backgrounded or backgrounded for less than 45 days before being turned out to grass. The results of this study indicate that ranchers who do not background cattle further increase the risk of morbidity in those cattle further down the production chain.

*Recommendation 2: Implement a Process Control and Verification Program.* This control system would measure, analyze, and maintain benchmarks and standard operating procedures to increase producer efficiency and provide a tool to improve morbidity numbers. Personnel at the feedlot would receive documentation from each ranch stating the backgrounding program and vaccination protocol followed. Process verification within the supply


chain would help reduce variation in the health status of the cattle supply. Likewise, benchmarks for the feedlot should be established to ensure cattle are processed in a timely manner, which would prevent instances of backlog like that which occurred in the fall of 2008.

Process verified control programs in the agriculture industry have increased in recent years (USDA, 2009). Independent companies offer services that provide third-party audits, training, and verification of process control or claims of product attributes. Third-party verification enables companies to ensure product claims and compliance to potential consumers; thus, third-party audits should increase product marketability due to customer confidence in the product. A program with control limits, corrective actions, penalties, and removal procedures for continuous noncompliance would ensure that the quality of CNB products and standards are maintained.

*Recommendation 3: Allocate Morbidity Costs Directly to the Ranch of Origin.* Shifting the financial burden of morbidity from CNB back to individual ranchers would incentivize on-ranch behaviors that minimize the risk of morbidity later in the production chain. Animals should be individually identified when moved from the CNB program to a traditional feeding program. Thus, instead of spreading the cost of sick animals in Lot 9000 over the entire CNB membership, treatment costs and lost productivity of individual animals could be allocated directly to the ranch of origin.

## Conclusion

It is especially important for niche market programs to be aware of production costs. Beef products that qualify for some niche markets must forego efficiency-enhancing technologies used in traditional production, such as the use of nontherapeutic antibiotics, growth-promoting implants, ionophores, and  $\beta$ -agonists. In addition, sick cattle treated with therapeutic antibiotics no longer qualify for programs such as the CNB program; consequently, minimizing morbidity at the feedlot is especially important for CNB. Similar niche beef production programs must take into account the

problems that may be encountered along the entire production chain in order to maintain supply, meet market demand, and keep production costs low. In this study, steps suggested to help CNB minimize morbidity include backgrounding cattle for at least 45 days, implementing a process verification program, and allocating morbidity costs to individual ranchers instead of the organization as a whole. Implementation of these recommendations should minimize feedlot morbidity in the CNB program and make the program more viable in the marketplace by reducing fluctuations in supply. 

## References

- Caswell, J. A. (1998). How labeling of safety and process attributes affects markets for food. *Agricultural and Resource Economics Review*, 27(2), 151–158. <http://purl.umn.edu/31517>
- Duff, G. C., & Galylean, M. L. (2007). Board-Invited Review: Recent advances in management of highly stressed, newly received feedlot cattle. *Journal of Animal Science*, 85, 823–840. <http://dx.doi.org/10.2527/jas.2006-501>
- Gardner, B. A., Dolezal, H. G., Bryant, L. K., Owens, F. N., & Smith, R. A. (1999). Health of finishing steers: Effects on performance, carcass traits, and meat tenderness. *Journal of Animal Science*, 77(12), 3168–3175.
- Mathis, C. P., Loest, C. A., & Carter, B. (2008). *Preconditioning beef calves*. Circular 637. New Mexico State University Extension.
- McCarty, R. (2010). *Consumer perceptions of beef safety: Research overview*. Research Report. National Cattlemen's Beef Association.
- Muth, M. K., Brester, G., Roccili, J. D., Koontz, S., Martin, B., Piggot, N., Taylor, J., Vukina, T., & Wohlgenant, M. (2005, July). *Spot and alternative marketing arrangements in the livestock and meat industries (interim report)*. Research Triangle Park, North Carolina: RTI International. <http://www.meatami.com/ht/a/GetDocumentAction/i/2461>
- Nixon, L. (2007). Exploring natural. *Beef Magazine*. [http://beefmagazine.com/mag/beef\\_exploring\\_natural/index.html](http://beefmagazine.com/mag/beef_exploring_natural/index.html)
- Nutrition Business Journal. (2010). *NBJ's 2010 Healthy Foods Report*. Retrieved from <http://lib.store.yahoo.net/lib/nbj/10hfreptoc.pdf>

- Richeson, J. T., Beck, P. A., Gadberry, M. S., Gunter, S. A., Hess, T. W., Hubbell III, D. S., & Jones, C. (2008). Effects of on-arrival versus delayed modified live virus vaccination on health, performance, and serum infectious bovine rhinotracheitis titers of newly received beef calves. *Journal of Animal Science*, *86*, 999–1005. <http://dx.doi.org/10.2527/jas.2007-0593>
- Roeber, D. L., Speer, N. C., Gentry, J. G., Tatum, J. D., Smith, C. D., Wittier, J. C., Jones, G. F., Belk, K. E., & Smith, G. C. (2001). Feeder cattle health management: Effects on morbidity rates, feedlot performance, carcass characteristics, and beef palatability. *The Professional Animal Scientist*, *17*, 39–44.
- United States Department of Agriculture (USDA). (2009). *Official listing of approved USDA process verified programs*. Retrieved March 2009 from <http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRD3320450>
- United States Department of Agriculture (USDA). (2010). *Meat and poultry labeling terms*. Retrieved from [http://www.fsis.usda.gov/factsheets/Meat\\_&\\_Poultry\\_Labeling\\_Terms/index.asp](http://www.fsis.usda.gov/factsheets/Meat_&_Poultry_Labeling_Terms/index.asp)

## An analysis of the impacts of health insurance rebate initiatives on community supported agriculture in Southern Wisconsin

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### Abstract

Since 2005, four insurance providers in southern Wisconsin have offered rebates to policyholders who subscribe to a local community supported agriculture (CSA) operation. Rebate program par-

ticipants rely on the Madison Area Community Supported Agriculture Coalition (MACSAC) — an organization that supports CSA farms and educates consumers about local food systems — to connect the insurance companies with CSA growers and consumers and to manage various aspects of the CSA rebate program, including vetting participating farms. The rebate makes fresh, seasonal, locally and organically grown fruits and vegetables more accessible to consumers by reducing the cost of a CSA share by up to 40%. As a result, CSA members report increased consumption of fruits and vegetables, one of the main goals of the program. With marketing overseen by MACSAC and the insurance companies, the rebate program has led to a reduction in the amount of time growers spend on advertising their operations and recruiting CSA members and has contributed to increased member retention from year to year. Additionally, both the number of MACSAC member farms and the total number of shares offered by these farms have increased substantially since the rebate program's inception. These trends reduce some of the risk growers face and allow them to expand production in order to serve a larger consumer base. These outcomes associated with the

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*Note:* Senior authorship is shared.

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MACSAC organization and the insurance rebate program indicate the success of the program, the importance of MACSAC as an organizing body, and the potential for implementing the program among national providers and in other locations where community supported agriculture is prevalent.

### **Keywords**

community supported agriculture, insurance rebates, local food, Wisconsin agriculture

### **Introduction**

Wisconsin is currently home to more than 202 community supported agriculture (CSA) farms (Local Harvest, n.d.). While these operations vary in size and types of produce offered, all seek to support a localized food system through direct connections between farmers and consumers. Forty-nine of Wisconsin's CSA farms are members of the Madison Area Community Supported Agriculture Coalition (MACSAC). Established in 1992, MACSAC organizes and supports CSA farms and educates consumers about the importance of a locally oriented food system.

In 2005, a health insurance provider in southern Wisconsin launched an innovative program that offers rebates to policyholders who subscribe to a CSA share through a MACSAC farm. Three other insurance companies servicing southern Wisconsin have since started CSA rebate programs of their own. By 2010, the four insurance companies together supplied over 20,400 CSA rebates to their members. Moreover, the number of MACSAC farms increased from 16 farms in 2005 to 42 farms in 2010, while the total number of shares offered annually grew from approximately 2,000 shares in 2005 to 9,000 shares in 2010, for a total of 27,600 shares in that six-year period. This trend suggests that the health insurance rebate program has helped to fuel the growth of community supported agriculture in southern Wisconsin, while at the same time encouraging households to consume more fresh fruits and vegetables and creating a heightened awareness of the local food system.

Owing to data limitations that currently preclude a statistical analysis aimed at isolating the impacts of the insurance rebate program on CSA share supply and demand, this paper will instead seek to draw inferences from observed trends, anecdotal data, and literature on CSA culture in order to explore the favorable consumer response to the CSA rebate program and to recommend future policy objectives. We begin by briefly outlining the concept of CSA and discussing the role of MACSAC in promoting and expanding CSA in southern Wisconsin, especially within the context of making CSA more economically viable for farmers. We then discuss the CSA health insurance rebate within the context of incentivizing healthy behavior and the program's impacts on MACSAC farms. The paper concludes with recommendations to expand the rebate program beyond southern Wisconsin.

### **Community Supported Agriculture: Motivations and Challenges**

Community supported agriculture arrived in the eastern United States in the early 1980s and has since spread to all regions of the country. In a typical CSA arrangement, shareholders pay at the beginning of the growing season for a supply of weekly "baskets" of fresh, seasonal produce. Advance payment allows farmers to cover the costs of inputs for that season, provides a stable and predictable income for the growers, and acts as a contract that guarantees — to an extent — weekly deliveries of fresh produce throughout the growing season. Emerging interest in local, organic, and sustainable food production in the United States has fueled continued growth in the popularity of CSA over the past decade, such that there are now CSA farms and "shareholders" in all 50 states (Local Harvest, n.d.). In 2010, there were over 3,800 CSA farms in operation in the United States and tens of thousands of subscribing households (Martinez, 2010; Local Harvest, n.d.). While relatively little research has been done to examine the factors contributing to the growth of CSA and its associated impacts, the increase in market share of organic vegetables — up 5.1% to US\$24 billion in 2009, according to USDA estimates — and increased interest in local food and "civic" agri-

culture signal the potential for further growth in the popularity of CSA (Martinez, 2010).

Farmers start CSA operations for numerous reasons, primarily to foster a stronger sense of community between grower and consumer and also to produce food using more sustainable methods (Woods, Ernst, Ernst, & Wright, 2009; Cooley & Lass, 1996). Although these are important motivators in the early stages and long-term operation of the farm, CSA growers face abundant challenges in maintaining a successful CSA program and farm operation in general. The results of a 10-year study conducted through 2006 illustrate some of the obstacles that CSA farmers face (Ostrom, 2007). Ostrom reported that of the 24 farms involved at the beginning of the study period, only 10 were still in operation by the end. Economic, health, and quality of life issues were all factors contributing to the failure of the CSA operations. Tegtmeier and Duffy (2005) further support the notion of economic challenges within CSA operations, finding that of the 55 Upper Midwestern CSA farmers surveyed in the spring of 2002, less than half felt that the share prices they charged to their members represented a fair return on their labor. The authors relate that the perception of obtaining a fair wage was associated with increasing revenues per acre as well as capital investments, the latter conveying the sense that smaller-scale operations could be at a disadvantage compared with their larger counterparts. Owing largely to the extent of operating costs coupled with a low share price, over half of CSA farmers surveyed in 2000 relied on off-farm income to make ends meet, a trend that, according to the 2007 Census of Agriculture, continues today (Sabih & Baker, 2000; USDA, 2009). Additionally, Woods et al. (2009) remark that 87% of the 205 respondents to a 2009 survey of CSAs in the American South and Midwest cited the use of marketing channels outside the CSA operation, such as farmers' markets, in an effort to diversify income. Sabih and Baker (2000), Oberholtzer (2004), and Brown and Miller (2008) report in their respective studies that CSA operators were barely able to cover operating costs and that many did not factor in a salary for themselves or family members as part of these

costs. Moreover, Ostrom (2007) noted that most CSA farms in the 2006 study referenced above could "only charge what the market would bear" (p. 118), which did not allow for prices that covered both operating costs and an adequate salary for operators and their families.

Another economic obstacle that CSA farmers face is member retention and recruitment (Tegtmeier & Duffy, 2005). A study conducted by the Small Farm Success Project found an average annual retention rate of 53% among CSA farms (Oberholtzer, 2004). Despite the fact that surveys conducted by farms and researchers have helped CSA farmers better understand the preferences of their members, CSA farmers still invest considerable time recruiting and advertising their operations (Perez, Allen, & Brown, 2003). Common CSA marketing channels include word-of-mouth, the Internet, various forms of social media, and more traditional methods such as print advertising. Additionally, many CSA farms also operate their own websites to inform prospective shareholders about their core mission, share offerings, and farm activities and events. The necessity of both retaining and recruiting members presents yet another challenge to CSA farmers in that it requires them to divert time otherwise invested in production and farm maintenance to marketing, with no guarantee that the membership numbers for a given season will meet the numbers necessary to keep the CSA operation afloat.

From the consumer side, Kolodinsky and Pelch (1997) model consumer propensity to participate in community supported agriculture in Vermont, finding that not only are potential CSA consumers price sensitive, but also that factors such as the presence of children under the age of 12 in the household are associated with a decrease of about 20% in the probability of joining a CSA. It is therefore important to consider that, holding all else equal, the influences of price and income alone on produce consumption may not carry a direct correlate with CSA membership uptake.

The challenges that thus confront CSAs on account of lower share prices and/or perceptions

of shortfalls in returns on efforts are often reasoned to be offset by certain “intangible benefits” (Tegtmeier & Duffy, 2005) that arise from engaging in CSA operation, in line with the above discussion on the motivations behind starting up a CSA. Drawing inferences from this pool of literature, subsidizing the cost of a CSA share may be one way to effectively reduce the price to the consumer while allowing growers to receive an adequate salary and thus increasing the economic feasibility of the operation.

### **Madison Area CSA Coalition**

Established in 1992, the Madison Area Community Supported Agriculture Coalition (MACSAC) supports and connects CSA growers and eaters through a range of activities. These include a farmer mentorship program, grower gatherings, community educational workshops, an annual open house where the public can meet MACSAC farmers and sign up for CSA memberships, a bimonthly newsletter, and distribution of MACSAC’s CSA-focused cookbook. The organization also works to increase access to fresh organic produce through the Partner Shares Program, which provides financial assistance to help low-income families purchase CSA shares from MACSAC’s member farms. MACSAC consists of a board of directors and three employees who oversee the organization’s administration and programming. This structure allows for input and active participation in the organization’s activities from both the farmer and consumer communities.

Each MACSAC farm undergoes an application and review process before it is accepted as a member of the coalition. Prospective farms are assessed according to criteria that are designed to ensure that each farm has the necessary production skills, marketing experience, land, equipment and facilities, communication infrastructure, and knowledge about community supported agriculture in order to manage a successful operation, produce high quality fruits and vegetables, and cultivate a positive overall experience for CSA members. Additionally, MACSAC requires all member farms to be certified organic by a federally approved certifying agency. Farms with annual sales of less than US\$5,000 are

exempt from certification but are required to meet all of the standards of the National Organic Program. Endorsed farms are eligible to receive MACSAC benefits, including placement on the annual MACSAC Farm List, access to grower mentorship and resources, participation in the annual open house and the Health Plan Partners Program (i.e., CSA rebate), and other activities (Madison Area Community Supported Agriculture Coalition [MACSAC], n.d.).

Over 60 farms have belonged to MACSAC at one time or another, serving memberships as small as four and as large as over 1,000 and providing tens of thousands of shareholders with fresh, locally grown, organic produce (Hendrickson, 2011). Share prices among MACSAC farms have increased from an average of US\$375 for a “standard” share (which typically feeds a family of four) in 1993 to an average of US\$550 today (MACSAC, 2010a).<sup>1</sup> “Small” or “half” shares are becoming more common and are typically priced around US\$375. Throughout these changes in farm membership, share availability, and share price, MACSAC has remained committed to its mission of fostering cooperation and educational opportunities among its farmer members while promoting and advancing a community-based food system.

### **The CSA Insurance Rebate Program**

In 2005, MACSAC began to partner with major health insurance providers in southern Wisconsin to promote preventative wellness, healthy eating, and local food through CSA membership rebates. Launched in 2005, the Health Plan Partners Program was the brainchild of one insurance provider that was looking to differentiate itself from competing health insurance companies by shifting away from traditional marketing techniques toward more community engagement initiatives. In search of a

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<sup>1</sup> MACSAC has kept records of varying detail on participation among its member farms over the past 19 years. The authors were granted access to this data in order to quantify the growth in CSA over this period. Household-level data is currently unavailable; however, a pending survey of MACSAC farmers and their CSA members will facilitate greater statistical analysis of the rebate program in the near future.



structure through which to encourage its policyholders to eat more fruits and vegetables, the insurance provider partnered with MACSAC on account of its standards that require member farms to produce quality, fresh produce using sustainable farming practices.

During the pilot year in 2005, two MACSAC farms and 96 health insurance policyholders participated in the rebate program (L. Brown, personal communication, November 1, 2010). Reaction was so positive that the total number of MACSAC member farms increased from 16 to 26 the following year, in part to meet the heightened demand for CSA memberships among policyholders. This increase represented an unprecedented rate of growth for MACSAC at the time. Moreover, farms filled their memberships more quickly that year, a trend that has continued each year since.

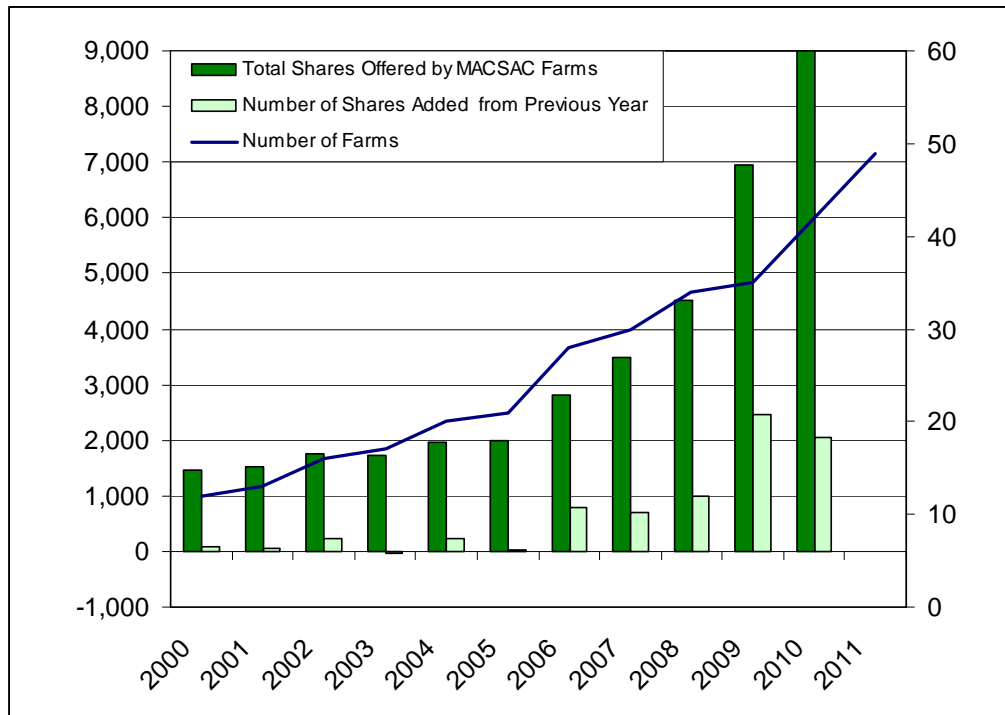
Following on this success, one additional health insurance provider in the Madison area began to offer the CSA rebate in 2007, and two more providers added the rebate in 2008. Each of the carriers

has partnered with MACSAC, through the Health Plan Partners Program, for administrative and marketing purposes. Under this arrangement, insurance providers are responsible for creating advertising materials to promote the CSA rebate program to policyholders and for supplying MACSAC with informational newsletters about their wellness programs, which are distributed to MACSAC farms and their shareholders. The insurance providers also direct policyholders to the MACSAC website, where they can learn about community supported agriculture and each of MACSAC's member farms. In turn, MACSAC promotes the rebate program and participating insurance providers through its outreach and education efforts. In 2006 alone, the program generated over 16 million total gross media impressions nationwide (Physicians Plus Insurance Corporation, 2007). Newspapers and sustainable agriculture networks across the U.S. spread the program's success story, and Madison-area news sources provided especially favorable coverage. Local news outlets touted the rebate program as a "visionary decision" that raised public awareness of

community supported agriculture and provided insurance policyholders a great way to take responsibility for their health (Bergin 2010, p. 17).

This unique advertising and marketing arrangement has contributed to a substantial increase in the number of health insurance policyholders claiming CSA rebates, from

**Figure 1. Increase in Number of MACSAC Farms and CSA Shares, 2000–2011**



the original 96 rebates claimed in 2006 to over 6,000 claimed in 2010 (table 1). To obtain the rebate, policyholders must provide their respective insurance companies with a copy of their farm sign-up form and proof of payment (i.e., receipt from the farm). Rebate values range from US\$50 to US\$100 for an individual and up to US\$200 for a family. This represents a price reduction of roughly 40% when compared to the average MACSAC farm price of US\$550 for a 20-week, standard share subscription.

That three additional insurance providers picked up the CSA rebate program so quickly after it was initiated suggests that doing so was a competitive response to retain members who may have otherwise switched to the initiating provider in order to take advantage of the incentive to purchase locally produced fruits and vegetables. In fact, the practice of incentivizing improved consumer behavior through various health insurance mechanisms is not a novel idea. Finkelstein, Fiebelkorn, and Wang (2003) observed that costs associated with obesity-related issues arise in the form not only of higher insurance premiums for company health plans, but also in productivity losses, such as work absences by employees with obesity problems. As such, Finkelstein and Kosa (2003) found evidence in favor of charging higher insurance premiums for obese employees who refuse to participate in weight-management programs, or offering discounts and reductions in copayments for healthy behavior. In support of the latter, Arterburn et al.

(2008) found that 41% of health insurance subscribers surveyed in the state of Washington agreed that financially based incentive programs would encourage weight loss. While there is a strong potential for positive health benefits in the long run among policyholders who participate in health incentive programs, in the case of southern Wisconsin, the Health Plan Partners insurance providers could likely be incentivized by the promotional benefits of offering the CSA rebate, namely that it ties them to the local food movement and the increasing propensity toward healthy eating and purchasing organic foods, thus giving them additional exposure in the community through which new policyholders may be obtained.

### Impact of the CSA Rebate Program on MACSAC Farms

Since the inception of the CSA rebate program, the demand for CSA shares in southern Wisconsin has increased substantially. In 2005, the pilot year of the rebate program, MACSAC farms offered approximately 2,000 shares in total, compared to 9,000 in 2010. This represents an increase of 450% over five years (see figure 1). Conversely, the previous five years (2000–2005) saw an increase of 137% in the number of shares offered by MACSAC farms, suggesting that the growth in available shares is closely associated with the success of the CSA rebate program. Moreover, since 2005, nearly 30 new CSA operations have joined MACSAC in order to take advantage of the demand for shares associated with the rebate, in

**Table 1. Number of CSA Rebates Claimed, 2005–2010**

Year	Insurance Co. 1	Insurance Co. 2	Insurance Co. 3	Insurance Co. 4	Total
2005	96	–	–	–	96
2006	972	–	–	–	972
2007	1,282	–	–	261	1,543
2008	1,486	1,564	965	689	4,704
2009	1,637	2,645	1,290	918	6,274
2010	1,746	2,334	1,475	1,049	6,624
<b>Total</b>	<b>7,219</b>	<b>6,543</b>	<b>3,730</b>	<b>2,917</b>	<b>20,429</b>

Sources: Madison Area Community Supported Agriculture Coalition, 2010; participating insurance providers.

addition to the other benefits derived from being a member of the coalition.

While individuals involved in developing the Health Plan Partners Program claim that there is a “direct correlation between the rebate and the growth in CSA memberships,” MACSAC acknowledges the difficulty in attributing a causal relationship, as no published econometric work has yet been undertaken to measure the direct effect of the program on membership uptake (K. Auberbach, personal communication, November 4, 2010; K. Mulvey, personal communication, November 18, 2010). Because an individual’s decision to become a CSA shareholder is influenced by a host of motivations, factors such as the heightened profile of local foods may be an equally important contributing influence, thus confounding the impacts of the rebate program alone. Additionally, it is possible that shareholders requesting farm receipts for their CSA share may be using them for purposes other than claiming the insurance rebate. Thus, relying on farm data alone may lead to inaccurate interpretations of the impact of the rebate program in terms of CSA memberships.

However, responses from 45 Partner Shares Program participants (see description of program above) in a MACSAC survey in 2010 convey some element of price sensitivity with respect to CSA memberships, suggesting that measures to draw down share prices could render favorable results in relation to increased memberships. Specifically, about two-thirds of the survey respondents reported that financial assistance was necessary in enabling their purchase of a CSA share in the 2010 season, and close to 90% intended to participate in the program again in 2011 (MACSAC, 2010b). While a promising statistic, it is necessary to account for the fact that Partner Shares participants qualify for assistance based on meeting certain household income characteristics. Therefore, financial assistance provided through such mechanisms as Partner Shares and the rebate program help to increase the accessibility of CSA across multiple income demographic groups that may otherwise not be able to afford the expense.

Additionally, the CSA rebate program has allowed farmers to spend less time advertising and recruiting new members and more time diversifying their operations and growing high quality produce. Rather than relying solely on their own marketing efforts and word of mouth among existing shareholders, MACSAC farms benefit from the increased exposure from promotional, educational, and outreach activities related to the rebate program. Furthermore, survey responses from MACSAC member farms demonstrate that the rebate program has helped to improve retention of existing members, as the rebate helps to buffer increases in CSA share cost from year to year.

Lastly, the economic value of the Health Plan Partners insurance rebate with regard to CSA memberships is substantial. Over the six-year period of the program, a back-of-the-envelope calculation using an extrapolation of the average percentages of individual versus family rebates claimed for two of the insurance companies yields the rough estimate of US\$3,049,000 in rebates issued to policyholders. Additionally, using MACSAC data to multiply the average share price for both standard and half shares by the number of standard and half shares purchased, respectively, during the years 2005–2010, we estimate that the total value of CSA shares purchased in this period was US\$14.2 million, placing the value of the rebates at roughly 21% of the total value of shares purchased. Not only do the CSA rebates open up opportunities through a lower effective share price, but the proportion of the value of rebates claimed relative to the total value of CSA shares purchased (21%) could essentially be viewed as the insurance companies’ contribution to policyholder health and wellness and promotion of local agriculture. Moreover, the lower effective share price keeps consumers at a higher level of disposable income, which in turn brings its own set of economic benefits through additional consumer expenditures in the community. The figures listed above thus demonstrate a positive economic impact on consumers. Perhaps more importantly for the CSA operations involved, the effectively lower price for consumers allows farmers to continue charging a share price that more closely mirrors the true value of the

share including, as Brown and Miller (2008) among others point out, an adequate salary for growers and their families. Consequently, incentives such as the health insurance rebate help to create a more economically viable operation for a subset of the agricultural community that struggles with a relatively high rate of farmer attrition.

### **Conclusion**

Given this analysis, we conclude that the CSA insurance rebate program has been positively received, in particular by the consumer population. As previously noted, the total number of CSA shares offered by MACSAC farms has increased due to growth in both the number of member farms and the number of shares offered per farm. While some of this growth may be attributed to expanding interest in local food and increasing concern over the methods of modern agricultural production, a substantial portion can likely be attributed to the membership demand associated with the Health Plan Partners CSA rebate program. As previously noted, although household level data, such as demographic and socioeconomic characteristics, associated with the rebate program is not available for privacy reasons, anecdotal evidence indicates a strong response to the price incentive rendered from the program. Specifically, claiming the CSA rebate can reduce the price of a standard share by up to 40%, bringing the cost close to the average household expenditure on fruits and vegetables for the same length of time, according to the U.S. Census Bureau (2000).

At the same time, it should be noted that there is concern among MACSAC growers that the rebate program has attracted a “new” type of CSA member, namely that those joining a CSA farm in order to obtain the rebate may lack awareness about the traditional relationship between CSA farmer and member, specifically with respect to the philosophy of shared risk. For example, the new CSA member may expect farms to provide specific types of produce in specific volumes throughout the growing season, irrespective of environmental factors that may inhibit production. To this end, MACSAC growers agree that the concept of shared risk, and education about CSA in general, should

be more clearly communicated to prospective members who may be looking for value in a CSA share versus a direct relationship with a farmer. Thus, as the decline in the effective price of CSA shares welcomes in a new type of CSA shareholder, it also opens the door for improved educational opportunities about risk-sharing, the importance of local agriculture, and community-building and environmental stewardship, all of which are fundamental tenets of the CSA philosophy.

Furthermore, based on responses from parties involved, it appears that the Madison Area CSA Coalition is a key element in the rebate program’s continued existence and function. In light of the rigorous application and review process that prospective member farms must go through in order to join the coalition, MACSAC acts as a clearinghouse for partnering insurance companies with regard to the quality of farms involved in the program and their ability to provide CSA members with a positive experience. This partnership reduces the need for high-level marketing of the program on the insurance companies’ end and streamlines the communication chain between insurance companies and participating farms. Yet, while there is significant interest nationally in bringing a similar rebate program to other states or regions, there have been no successful replications to date (K. Mulvey, personal communication, November 18, 2010). For example, attempts made in 2010 to encourage a health insurance provider in western Wisconsin to pilot the rebate program independently of MACSAC (although in collaboration with a MACSAC member farm) have proved unsuccessful thus far. As a result, plans are now in the works to incorporate the insurance provider into the Health Plan Partners Program, in affiliation with MACSAC. Therefore, we hypothesize that replication of the CSA rebate program across the country is largely contingent on having an organization like MACSAC to serve as an intermediary between health insurance providers and CSA farmers and consumers.

There is much room for further research into the dynamic between insurance rebates and expansion of the CSA model as a means to enhance quality of

life for both consumers and producers. While the 2007 Census of Agriculture (USDA, 2009) included data on community supported agriculture for the first time, better data collection at the local and national levels will allow for improved analysis of the growth and economic impacts of CSA, as well as programs like the health insurance rebate. Despite the current lack of data to conduct an empirically oriented investigation into the exact impacts of the rebate program on CSA membership in southern Wisconsin, the success of this initiative appears to be demonstrated through the experiences of the four health insurance companies discussed throughout this paper, in addition to the increase in both MACSAC farms and total number of CSA shares offered by MACSAC farms since the program's inception. Therefore, transplanting the Healthy Plan Partners model to other areas within Wisconsin, as well as to different regions of the United States, is recommended as a future policy objective, provided that an organization such as MACSAC is in place to facilitate the connections between health insurance providers, farmers, and consumers interested in community supported agriculture.

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### References

- Arterburn, D., Westbrook, E. O., Wiese, C. J., Ludman, E. J., Grossman, D. C., Fishman, P. A., Finkelstein, E. A., Jeffery, R. W., & Drewnowski, A. (2008). Insurance coverage and incentives for weight loss among adults with metabolic syndrome. *Obesity, 16*, 70–76. <http://dx.doi.org/10.1038/oby.2007.18>
- Bergin, M. (2010, February). Special Delivery. *Madison Magazine*.
- Brown, C., & Miller, S. (2008). The impacts of local markets: A review of research on farmers markets and community supported agriculture. *American Journal of Agricultural Economics, 90*, 1296–1302.
- Cooley, J. P., & Lass, D. A. (1996). *What's your share worth? Some comparisons of CSA share cost versus retail produce value*. Stillwater, New York: CSA Farm Network Publications.
- Finkelstein, E. A., Fiebelkorn, I. C., & Wang, G. (2003). National medical spending attributable to overweight and obesity: How much, and who's paying? *Health Affairs, 33*, 219–226.
- Finkelstein, E. A., & Kosa, K. M. (2003). Use of incentives to motivate healthy behaviors among employees. *Gender Issues, 21*(3), 50–59. <http://dx.doi.org/10.1007/s12147-003-0005-0>
- Hendrickson, J. (2011). History of MACSAC: The Madison Area Community Supported Agriculture Coalition, a retrospective. Retrieved from <http://www.csacoalition.org/about/history/>
- Kolodinsky, J. M., & Pelch, L. L. (1997). Factors influencing the decision to join a community supported agriculture (CSA) farm. *Journal of Sustainable Agriculture, 10*(2/3), 129–141. [http://dx.doi.org/10.1300/J064v10n02\\_11](http://dx.doi.org/10.1300/J064v10n02_11)
- Local Harvest. (n.d.). Community Supported Agriculture. Retrieved from <http://www.localharvest.org/csa/>
- Madison Area Community Supported Agriculture Coalition (MACSAC). (n.d.). *Become a coalition farm*. Retrieved from <http://www.csacoalition.org/our-work/farm-programs/#newfarm/>
- Madison Area Community Supported Agriculture Coalition (MACSAC). (2010a). *MACSAC farms and shares through 2010*. [Excel spreadsheet].
- Madison Area Community Supported Agriculture Coalition (MACSAC). (2010b). *Partner Shares survey 2010*. [Excel spreadsheet].
- Martinez, S. W. (2010). Varied interests drive growing popularity of local foods. *Amber Waves — The Economics of Food, Farming, Natural Resources, and Rural America* (published by the USDA Economic Research Service), 8(4), 10–17.
- Oberholtzer, L. (2004). *Community supported agriculture in the Mid-Atlantic region: Results of a shareholder survey and farmer interviews*. Retrieved from <http://www.winrock.org/wallace/wallacecenter/documents/wc-CSAReport.pdf>
- Ostrom, M. R. (2007). Community supported agriculture as an agent of change: Is it working? In C. C. Hinrichs & T. A. Lyson (Eds.), *Remaking the North American Food System: Strategies for Sustainability* (pp. 99–120). Lincoln, Nebraska: University of Nebraska Press.

- Perez, J., Allen, P., & Brown, M. (2003). *Community supported agriculture on the Central Coast: The CSA member experience*. University of California at Santa Cruz: Center for Agroecology and Sustainable Food Systems. Retrieved from <http://escholarship.org/uc/item/5wh3z9jg>
- Physicians Plus Insurance Corporation. (2007). *Eat Healthy Rebate Program Description*. Madison, Wisconsin: Self.
- Sabih, S. F., & Baker, L. B. B. (2000). Alternative financing in agriculture: A case for the CSA method. *Acta Horticulturae (ISHS)*, 524, 141–148. Retrieved from [http://www.actahort.org/books/524/524\\_16.htm](http://www.actahort.org/books/524/524_16.htm)
- Tegtmeier, E., & Duffy, M. (2005). *Community supported agriculture (CSA) in the Midwest United States: A regional characterization*. Leopold Center for Sustainable Agriculture, Iowa State University.
- United States Census Bureau. (2000). *Income, expenditures, poverty & wealth*. Retrieved from [http://www.census.gov/compendia/statab/cats/income\\_expenditures\\_poverty\\_wealth.html](http://www.census.gov/compendia/statab/cats/income_expenditures_poverty_wealth.html)
- United States Department of Agriculture (USDA). (2009). *2007 Census of Agriculture: United States summary and state data*. (Volume 1 Geographic Area Series Part 51, Publication No. AC-07-A-51). Washington, DC: National Agricultural Statistics Service.
- Woods, T., Ernst, M., Ernst, S., & Wright, N. (2009, July). *2009 survey of community supported agriculture producers*. Agricultural Economics Extension Series 2009–11, University of Kentucky Cooperative Extension Service, pp. 1–24.

## Acculturation and consumption: Examining the consumption behavior of people of Afro-Caribbean descent in Canada

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### Abstract

This paper examines the consumption of ethnocultural vegetables by people of Afro-Caribbean descent in the Greater Toronto Area (GTA) of Canada while considering their acculturation level. The results indicate that the respondents are willing to substitute other closely related varieties for their ethnic vegetables when they are scarce. The acculturation scale also indicates that these Canadians assimilate and accept the values of other ethnic groups while they retain their own identity. As consumption of ethnocultural vegetables is part of their identity, among GTA Afro-Caribbean Canadians there is a very large unmet demand for ethnocultural vegetables, which is likely to be true throughout the country.

### Keywords

acculturation, Afro-Caribbean, consumption, ethnocultural vegetables, Greater Toronto Area

### Introduction

Researchers have suggested that ethnicity, which refers to people who share the same cultural heritage, has a strong impact on the consumption pattern of ethnic groups, especially when they are away from their home countries (Adekunle, Filson, & Sethuratnam, 2010; Gren, 1999; Hamlett, Bailey, Alexander, & Gareth, 2008). The consumption pattern of ethnic Canadians is not well researched, aside from a few studies (Adekunle et al., 2010; Abdel-Ghany & Sharpe, 1997; D'Astos & Daghfous, 1991; Lee & Tse, 1994; Wang & Lo, 2007). However, there is no extensive study of ethnocultural food consumption by people of African descent in Canada (defined as people from sub-Saharan Africa and the Caribbean or West Indies who now reside in Canada).

Analysis of consumption within a cultural context is complicated, especially in the case of African descendants, with differences as the result of the

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various countries of origin. Due to this complexity, it is appropriate to study ethnic behaviour by taking into consideration age, gender, socioeconomic characteristics, place, and generational difference (Hamlett et al., 2008; Jackson et al., 2006; Miller, Jackson, Thrift, Holbrooke, & Rowlands, 1998). While considering all these variables, this paper is an attempt to enhance understanding of the consumption behavior of Afro-Caribbean Canadians (AC-Canadians), with an emphasis on the vegetables they consume that come from their respective countries. Although consumption decisions at times are more subjective than rational, vegetables that are associated with specific cultures will continue to be sought based on an ethnic group's past experience, or what we refer to as their bounded rationality — in which decision-making by individuals is limited to the information at their disposal or past experiences (Simon, 1955). The subjectivity and different utility levels experienced by each consumer develop as a result of personal characteristics, years spent in Canada, and degree of acculturation (assimilation of other ethnic groups' values, norms, foods, and ways of life). Many authors (Dwyer & Jackson, 2003; Gregson, Crewe, & Brooks, 2002; Jackson, 2002) have also analyzed consumption and they believe that consumption operates within a cultural context.

Since this paper's analysis is within a cultural context, a clear understanding of the phenomenon that defines a people's level of integration with and assimilation of other cultural values within Canada — their level of acculturation — is required. An understanding of acculturation is needed because consumers who are visible minorities (visibly distinct from the dominant ethnocultural groups) are often in a multiple state of identity, which affects their interactions within and outside their ethnic group (Jamal & Chapman, 2000). A careful examination of the acculturation level of AC-Canadians is important because it shows how easily they can be integrated into Canadian society and what impact their degree of acculturation has on their consumption of ethnocultural vegetables. Immigrants express their ethnic identity through their patterns of consumption behavior, so a critical analysis of the acculturation and consumption

behavior of a particular ethnic group is required (Herche & Balasubramaian, 1994; Jamal & Chapman, 2000). Acculturation levels also influence the expenditure on and consumption of different commodities (Herche & Balasubramaian, 1994).

This paper concentrates on the Greater Toronto Area (GTA) because it is the largest metropolitan area in Canada, with a population of close to six million. African descendants in the GTA number about 400,000, making them the third largest ethnic group in the GTA, and thus their food demands should affect what foods are available in stores. In this paper we have chosen to focus on the vegetables that relatively recent immigrants to the GTA eat or would like to eat. This paper also discusses the interconnection between acculturation and consumption patterns of people of Afro-Caribbean descent in the GTA. The types of vegetables consumers are eating are changing in the GTA because the demographics of the city have been changing substantially over the past several decades.

### **Acculturation and Consumption**

There is a growing body of research that considers the relationship between acculturation, ethnicity, and consumption. The connection between consumption patterns and ethnicity in Canada has been explored (for example, Abdel-Ghany & Sharpe, 1997). One's personal history and culture tends to determine food preferences (Neff, Palmer, McKenzie, & Lawrence, 2009).

Acculturation is not a linear process that leads to assimilation; in any case, "acculturation and the assertion of ethnic identity are not mutually exclusive" (Hamlett et al., 2008, p. 97). Rather the authors approvingly cite Berry (1980), who argues that "acculturation is a bi-directional process in which an individual constantly moves back and forth, between positions of assimilation, integration, marginality and separation" (cited in Hamlett et al., 2008, p. 97).

Acculturation arises when people from different ethnic groups decide to co-exist in the same location, leading to changes in the original cultures of



both groups (Chapman & Jamal, 2000). Acculturation can arise as a result of migration to a new country for work or education, or for personal reasons (Laroche, Chankon, & Hui, 1997). According to Berry (1980), there are four modes of acculturation: integration, assimilation, separation or rejection, and marginalization/deculturation. The mode an individual adopts and the extent of acculturation depend on exposure, proper understanding of the new culture, and the circumstances that prevail in his or her immediate environment (Dato-on, 2000). Understanding acculturation requires exploring the concept of ethnicity, which can be examined through different dimensions (Webster, 1994). It can be defined as the shared heritage of a racial group (Jamal & Chapman, 2000), or as individuals self-identifying as members of a particular group based on such variables as language, values, norms, religion, and skin color (Jamal & Chapman, 2000; Tajfel, 1981). Cognition and perception are involved, because individuals of the same ethnicity might not accept readily the expectation of the group, based on their own personal conviction or exposure to other realities that makes them more accommodating to other people's culture and skeptical about certain parts of their own culture.

Consumers' level of acculturation can affect disposition to purchase their ethnic foods and their acceptance of foods alien to their culture. The more integrated and assimilated an individual is into the dominant culture, the less inclined they may be to purchase their original ethnic foods and the more likely they may be to consume foods that were not part of their previous culture. For exam-

ple, a second-generation African descendants living in Canada may be more accommodating to non-African vegetables than a Nigerian who migrated to Canada a decade ago. Adaptation as the result of exposure and learning can explain these differences.

The effect of acculturation on the consumption behavior of certain ethnic groups in Canada has been documented. D'Astos and Daghfous (1991), for example, suggest that highly acculturated Muslim Arabs show signs of social integration into the host society, while less acculturated individuals remain involved mainly with Arab mosques, cultural associations and institutions within Canada. The higher the acculturation level, the lower the sense of ethnic identity. Lee and Tse (1994) discovered that media consumption among immigrants from Hong Kong varies with the level of acculturation; the longer they have lived in Canada, the less likely they are to use ethnic media as compared to host media.

According to Penaloza (1994), acculturation involves movement and adaptation. It involves the adaptability of consumers to the realities of the cultural environment in a new country. Many researchers (Bojanic & Xu, 2006; Cleveland, Laroche, Pons, & Kastoun, 2009; Jamal & Chapman, 2000) perceive a strong link between acculturation and consumption. As a recognition of the significance of acculturation, we developed a scale that can be used to measure acculturation for all types of ethnic Canadians, called the Ethnic Canadian Dietary Acculturation Scale (table 1).

**Table 1. Ethnic Canadian Dietary Acculturation Scale**

Statement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I enjoy speaking English.	5	4	3	2	1
Most of my friends are outside my ethnic group.	5	4	3	2	1
I enjoy English-language movies and TV programs.	5	4	3	2	1
I learn a lot from people outside my ethnic group.	5	4	3	2	1
I welcome most of the values held by people outside my ethnic group.	5	4	3	2	1
I have difficulty accepting most of the values held by my ethnic group.	5	4	3	2	1
I prefer foods that are not my ethnic food.	5	4	3	2	1

Unlike the Western Dietary Acculturation Scale and Chinese Dietary Acculturation Scale developed by Satia et al. (2001), or Bojanic and Xu's (2006) Chinese Acculturation Scale, this new scale can be used to measure the level of acculturation of any ethnic Canadian.

Acculturation and specific types of consumption are related to immigrants' cultural socialization. As people are socialized into their culture they acquire food preferences. Of course vegetables are not ethnic, people are; but particular ethnic groups prefer particular vegetables, so it is in this sense that we use the word "ethnic" or "ethnocultural vegetables" because these are vegetables preferred by particular ethnic or cultural groups. This paper contributes to our understanding of this relationship by examining the acculturation level of people of Afro-Caribbean descent in the GTA and their consumption of "ethnic vegetables."

### **Responding to the Need for Alternative Nontraditional Crop Markets for Ontario Farmers**

Although there has been considerable recent interest in consuming local, fresh produce, the rapidly growing local food movement and changing demographic structure has been largely ignored by the largest vegetable producers (Lammers-Helps, 2010; Marzall, Filson, & Adekunle, 2011). FarmStart,<sup>1</sup> on the other hand, has been working with relatively recent immigrants, who use small plots to grow ethnocultural vegetables (ECV) that are increasingly in demand. Unfortunately, the interest in producing for this rapidly growing niche market has been slow to develop among the 7,500 vegetable producers represented by the Ontario Fruit and Vegetable Growers' Association (OFVGA) (Gunst, Jaque, Jurgens, & McDowell, 2010).

Still, much agronomic research is needed to determine which of the most preferred ECV can be

grown in this region, how pests of ECV can be controlled, what regulations are needed, and how these vegetables can best be processed (Filotas, 2009). As Simcoe Research Station's Alan McKeown has observed, there are still no registered pest control products available for ECVs, which means that they may have to be grown organically at higher cost and risk (cited in Gunst et al., 2010). Cerkauskas et al. (1998) observed that while little was known about pests, cruciferous vegetables were widely grown near the GTA and amounted to about half of the ECV grown in the region in 1993–94.

There are now more opportunities to reach local, alternative markets through the increasing number of farmers' markets and ethnic stores, which even include ethnically focused supermarkets. There also are growing opportunities for local farmers to produce many of these people's preferred vegetables, given the rising number of Asian, African, and Latin American immigrants and, as Gunst et al. (2010) indicate (citing Statistics Canada's data), the fact that 55% of Canada's vegetables are still imported. Still, there is a substantial disconnect between the growing market for their vegetables and the willingness of Ontario commercial vegetable producers who are largely of European descent to grow these vegetables. Though the leaders of OFVGA would like their farmers to be more involved in producing for these niche vegetable markets, there still is no ethnic vegetable association among their 28 fruit and vegetable groups, which may be due at least in part to a cultural difference between the association and, especially, some of the more recently immigrated ECV growers and consumers (Filson, 2011). This notwithstanding, many commercial farmers have acknowledged that while there are cultural barriers hindering them from producing for this vegetable market, there is also a lack of knowledge of how to grow vegetables of primarily tropical origin, as well as a lack of knowledge about how to access the market for these vegetables. As Peter Katona of Foodlink<sup>2</sup> acknowledged, "our farmers are quite

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<sup>1</sup> According to FarmStart's website, "the objective of FarmStart is to support and encourage a new generation of farmers to develop locally based, ecologically sound and economically viable agricultural enterprises." (<http://www.farmstart.ca/>)

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<sup>2</sup> According to its website, "Foodlink is a non-profit organization that creates partnerships with food producers,

traditional with what they grow” (cited in Gunst et al., 2010, p. 21). These farmers usually don’t eat the same vegetables because they are generally not Asian, African and Latin American. And as Gunst et al. (2010) remind us, “knowledge of the production of ethnic vegetables and the corresponding ethnic populations are not sufficient to fully understand the relationships between culture and demand for local vegetable production in Ontario” (p. 21).

By improving our understanding of this relationship, this research intends to strengthen the local food movement in Ontario. The Christian Farmers Federation of Ontario (CFFO) would like to help its farmers take advantage of local market opportunities by educating both consumers and producers about the importance of local food and serving as an information conduit between and among producers. In addition, they would like to continue advocacy efforts to improve the market access of small-scale producers (Stevens, 2008) which would happen if more ECV were grown locally. Donald (2009) has observed that local food benefits Ontario’s economy by generating jobs within local regions. Besides, as Bentley and Barker (2005) have argued, there is growing concern about the distance vegetables travel before reaching consumer plates because transportation contributes to global warming.

Commercial producers who perceive the ethnocultural food market as too small may choose not to enter the market because they believe that it lacks sufficient incentive for them to innovate and commercialize products for the market. The ethnic population of the American East Coast also has increased, however, producing opportunities for farmers willing to grow ethnocultural crops. Producers living close to densely populated ethnic areas especially have been encouraged to take advantage of the opportunity due to low transportation costs (Govindasamy et al., 2007). This

market is close enough to be accessed by Ontario producers as well.

Obviously, there are a number of barriers to establishing a new crop industry, yet the constantly changing agricultural industry, and in Ontario’s case the continual decline of smaller farms (Filson, 2011), suggest that establishing new and diversified crops is essential to the survival of vegetable farming. Bordelon, Browning, and Wagner (1996) argue that interested producers should consider the challenges of weather conditions as well as whether a new crop is compatible with current farming practices. Horticultural research including test plot trials is now being done on this topic with those ECV in highest demand within southern Ontario by the Simcoe Research Station and Vineland Research and Innovation Centre (Davidson, 2011).

Rising demand for ethnic food has made this food market increasingly mainstream, and the benefits of catering to these niche ECV markets can benefit others in the supply chain. WCM Consulting (2008) discovered that there is very significant potential for Canadian ethnic food processors to cater not only to their domestic market but to expand into the Northeast United States as well. WCM Consulting argues that consumers value “authenticity of taste,” although second-generation immigrants are likely to be more accepting of Western modifications. The demand for authentic taste requires that the food be obtained either from the country of ethnic origin or grown locally. Transportation is a significant concern when considering marketing these foods to the United States, as U.S. border requirements can delay shipping for unknown periods of time. Because shelf life is a concern, WCM Consulting suggests that processors focus on sauces, spices, dried foods, and shelf-stable, ready-to-eat meals. As Ontario’s demographics continue to shift, individuals and organizations within the food production and processing sectors must recognize and adapt to the opportunities that are becoming available.

Unfortunately, as Donald and Blay-Palmer (2006) argue, both the Ontario government’s regulatory regime promoting agri-food production and the

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processors, retailers and consumers to promote the sale and consumption of locally grown and produced food.” (Foodlink Waterloo Region, <http://www.ohpe.ca/node/9555>)

macro-regulatory environment affecting Toronto that derives from Canada's participation in the North American Free Trade Agreement (NAFTA) and World Trade Organization (WTO) "make it very difficult for national and sub-national governments in Canada to shift public procurement towards supporting locally grown, nutritious, quality food" (p. 1914), including, more specifically, ethnic and locally grown food. Instead, the government's focus has concentrated on biotechnology and export market opportunities for agri-food firms in the region, while ignoring the potential of the local food movement for production and consumption of quality food (Donald & Blay-Palmer, 2006). Nevertheless, the demand for ECV continues to grow as more immigrants arrive. Thus, Donald and Blay-Palmer argue that the consumer-led rise of the specialty, ethnic, and local-food systems in urban areas like Toronto has been swimming against the current of Canada's present food policy. The creative food economy that includes ethnocultural vegetables "is one of the fastest growing subsectors of the food industry within the city and deserves some serious attention" (Donald & Blay-Palmer, 2006, p. 1914).

## Methods

### *Study Design*

This study was part of a market research project on the demand for ethnocultural foods in the Greater Toronto Area. The regional municipalities in the GTA include Durham, Halton, Peel, and York. As a result of change in demographics, many people in the GTA were not born in Canada. Several of the largest ethnic groups in the GTA as indicated in the 2006 Census were selected for this study, including South Asians, Chinese, and AC-Canadians. A total of 250 participants from these groups were interviewed, using a semistructured questionnaire developed after pretesting and expert evaluation. The questionnaires were administered through ethnic societies and ethnic stores in the GTA (Adekunle, Filson & Sethuratnam, 2009).

The societies and stores selected for the survey were randomly selected from a list developed after

several consultations with stakeholders in the GTA and a preliminary survey. Questionnaires were only administered to respondents who were willing to participate and were from societies that wanted their members to participate. The design was developed in such a way that we were able to make inferences about the population from the sample. The results below are presented in the recognition that there was some modest danger of response bias and some concern that those who agreed to participate in our face-to-face interviews may have excluded some participants, but our  $\pm 6.2\%$  sampling error for the GTA is quite good. Relative to other, less representative, techniques such as random digit dialing and online surveys the results below are quite representative of the GTA's population. The respondents were also the main grocery buyers from their respective households. This paper concentrates on the analysis of the results from the interviews with AC-Canadians.

### *Instrument*

The data collection instrument used for the study was a semistructured interview questionnaire. The questionnaire had five sections: expenditure on vegetables, consumption of ethnic vegetables, acculturation, background information, and personal characteristics of respondents. Some of the questions had a Likert-type scale (5 = very important, 4 = important, 3 = neither important nor unimportant, 2 = unimportant, 1 = very unimportant), such as for our scale on acculturation, the Ethnic Canadian Dietary Acculturation Scale (ECDAS). The ECDAS is a seven-item scale with a Likert-type scale of 1 to 5 (5 = strongly agree, 4 = agree, 3 = neither agree nor disagree, 2 = disagree, 1 = strongly disagree). The ECDAS was used to measure the level of acculturation of ethnic Canadians. We tested for the reliability of the scale with Cronbach's alpha value. Questions in the other sections were either structured, with a minimum of two options (e.g., Yes/No), or open-ended, with the respondents providing the answers. The questionnaire and consent process were approved by the University of Guelph Research Ethics Board.

### *Survey*

Examining the behavior of consumers requires a detailed understanding of the unit of analysis and the phenomenon under study. Therefore, we did an exploratory study using a draft questionnaire to better understand the behavior of this population of ethnic Canadians. The semistructured questionnaire was administered to respondents in Guelph. In addition to pretesting the questionnaire with these individuals, in-depth interviews were also conducted as part of an expert review with people who have a broad knowledge about ethnicity, food consumption, and types of ethnic vegetables.

Our exploratory survey gave us insight into appropriate ways to conduct a survey of ethnic Canadians and sampling procedures and analytical techniques, as well as better understanding of the vegetables consumed by ethnic Canadians and the health implications of consuming ethnic vegetables. In our exploratory survey, we discovered that in order to make inferences about the population from the sample, a probability-based sampling technique should be used with survey respondents. Based on this premise, we used systematic sampling, defined in this context as every *n*th person in a particular situation being interviewed even if there is no sampling frame.

AC-Canadians were selected primarily through their ethnic associations. We discovered that many, if not most, non-English and non-French ethnic Canadians belong to at least one ethnic association. Other respondents were interviewed when they came to shop at their ethnic grocery stores. Ethnic stores were selected based on systematic purposive sampling. We had a comprehensive list of the ethnic stores in the GTA, from which we selected every third for the survey. After pre-testing the questionnaire in Guelph, a review with experts (including food, botany, and ethnicity experts, ethnic individuals, farmers, and public and private organizations) was conducted on the instrument. The final pretesting we did before the main survey was field pretesting: all our research assistants went to different stores in the GTA to obtain field experience. The research assistants were trained on the ethical and administrative issues involved with

face-to-face administration of questionnaires. Four research assistants selected from the University of Guelph and from within the GTA were involved with the field survey and data entry. A total of 250 responses were used in this analysis, out of a population of 372,985 AC-Canadians in the GTA. This gave us a sampling error of about  $\pm 6.2\%$ , which is reasonable because each respondent represented a household of an average of four people, and they answered questions on behalf of their households.

The cross-sectional survey posed some problems, as the respondents had to rely on memory to give information about their income and expenditure patterns. This was expected because most of the respondents do not keep records. Some of the respondents were also reluctant to disclose their monthly incomes. The research assistants had to ask a series of logically related questions to arrive at the estimates used in this study. Due to suspicion and the rather nonchalant attitude of some respondents, questions relating to demographic factors such as age, educational attainment, marital status, and income were also viewed as too personal to use. As a result of all these challenges, some of the variables used in the model were either underestimated or overestimated. This does not invalidate the conclusions of the study because there is a compensatory effect so that the bias in estimation will even out through the use of average values across respondents and households.

### *Analysis*

Descriptive statistics, factor analysis, and analysis of variance (ANOVA) were used to examine the relationship between acculturation and consumption pattern. The ECDAS was tested for reliability and unidimensionality of measurement by Cronbach's alpha. Principal component analysis was used to assess the factors that underlie the acculturation scale. Since the study was done with a probability sampling technique, inferences about the population can be made from the sample. Descriptive statistics such as frequencies and means were used to describe the characteristics of respondents and their consumption of and expenditure on ethnic vegetables. Analysis of variance

was used to compare the means of acculturation scores based on various socioeconomic variables covered by the study.

## Results

### *Descriptive Statistics*

The respondents all live within the GTA and have a range of socioeconomic characteristics. The description of the respondents is presented in table 2. As seen in the table, a greater percentage (57%) was male. The explanation for this is that most often men provide the money for groceries, so they are the most likely to be the main grocery buyer in the household. Often when the couple came together to the store, the husbands would answer the questionnaire while their wives did the shopping. It also may be culturally appropriate among some categories of people of African descent for the husband to assume that he is supposed to respond to questions that pertain to the family. As expected, most of the respondents were educated (a condition for migration), married, and had an average household size of three, although household size ranged from one to eight people. Another characteristic of the respondents

**Table 2. Personal Characteristic of Respondents, 2009 (N=250)**

Gender	Frequency (n / %)
Male	140 (56.7%)
Female	107 (43.3%)
<b>Marital Status</b>	
Married	136 (56.4%)
Single	86 (35.7%)
Divorced	15 (6.2%)
Widowed	4 (1.7%)
<b>Highest Educational Attainment</b>	
University degree	92 (38.5%)
College diploma	91 (38.1%)
High school	53 (22.2%)
Primary education	3 (1.3%)
<b>Average Age of the Respondents</b>	39.14 years
<b>Average Household Size</b>	3.4 members
<b>Average Total Monthly Income</b>	CA\$3,400

**Table 3. Source of Vegetables Consumed by Respondents (N=250)**

Source of Vegetable	Frequency (n / %)
Supermarket	190 (76%)
Ethnic grocery stores	120 (48%)
Farmers' market	43 (17.2%)
My farm	18 (7.2%)

was that they were mostly low- to middle-income earners, with an average monthly gross income of CA\$3,400.

The respondents indicated that they obtain vegetables (both ethnic and non-ethnic) most often from mainstream supermarkets, followed by their ethnic grocery stores (table 3). When some of their preferred vegetables are not available, they substitute another vegetable similar to their preferred ethnic vegetable. They also patronize Chinese ethnic supermarkets, where they can get some vegetables more closely resembling the species they consumed back home. The Chinese ethnocultural market is better established in the GTA than the markets of African ethnicity, and A-C Canadians also often find vegetables of medicinal benefit in Chinese stores. We also discovered that AC-Canadians consume a rich variety of vegetables that are consumed by South Asian and Chinese residents of the GTA (Adekunle et al., 2010).

A detailed analysis of the ethnic vegetables mentioned by those of African descent in the GTA led to the following list of the vegetables highly preferred by AC-Canadians in the GTA,<sup>3</sup> along with their names in other languages:

<sup>3</sup> Whether each of these ECV can be realistically and profitably produced in Canada is a much bigger research project than we have attempted so far, but researchers are now working in this area at the University of Guelph. Many are presently being grown profitably (e.g., crucifers, amaranth, okra), and most could be grown either in a greenhouse or started in a greenhouse and finished during June–September in Niagara, Simcoe and to a lesser extent the Holland Marsh. Researchers at Simcoe also assert that some are being grown as far north and east as the Ottawa valley. Although consumers at times look

1. Okra (*Abelmoschus esculentus*) — Lady finger, Bhindi (India), Ila (SW Nigeria), Huang Sukui (China), Gumbo (Swahili)
2. African Eggplant/Garden Eggs (*Solanum melongena* — *Solanum aethiopicum*, *Solanum gilo*, *Solanum olivaire*, *Solanum pierreanum*) — Ngilo (Swahili), Nakasuga/Nakati (Uganda), Njilu (Democratic Republic of Congo [DRC]), Gboma (Togo), Ikan/ Igba/Igbo (SW Nigeria), Ntorowa/ Ntobu/Yaduwa (Ghana)
3. Smooth Amaranth (*Amaranthus sp.*) — Efo tete (SW, Nigeria), Bitekuteku (DRC), Callalou/Kallaloo (Jamaica), Yin choi, Chinese spinach (China), Thotakura, Cheera (India), Mchicha (East Africa), African spinach, Indian spinach, Bonongwe (Malawi), Thepe (Botswana), Grins/Hondi (Sierra Leone), Alayyafu/ Alefu (Hausa — West Africa), Madze/ Efan/Muotsu, Swie (Ghana), Lalshak (Bengali)
4. Tomatoes (*Solanum lycopersicum*, syn. *Lycopersicon lycopersicum* & *Lycopersicon esculentum*)
5. Yams (*Dioscorea batatas*) — Yellow Yam, White Yam
6. Pumpkin/Squash (*Cucurbita sp.*) — Kaddu (South Asia), Chinese Squash
7. Plantain (*Musa paradisiaca*)
8. Cocoyam leaves/Corm (*Colocasia esculenta*/*Xanthosoma sagittifolium*) — Taro, Dalo (Fiji), Seppankizhangu (Tamil), Gabi (The Philippines), Pindalu, Karkalo (Nepal), Nduma (Kikuyu — Kenya), Ala (Maldives), AmaDumbe/Madumbi (Zulu — South Africa), Dasheen, Eddoes (West Indies/Caribbean), Coco (Nigeria), Kontomire (Ghana), Kachu/Kochu (Bengali), Ghuiyan (Hindi), Arvi (Hindi), Macabo (Cameroun), Yu tou/Yu nai (China), Wuh tau (Hong Kong), Arrow roots
9. Yardlong Bean (*Vigna unguiculata* subsp. *sesquipedalis*) — Cowpea/Long-podded cowpea, Asparagus bean, Snake bean, Chinese long bean, Dau gok (Cantonese), Jiang dou (Mandarin), Bora (West Indies), Borboti (Bengali). Also: Black-eyed pea/ bean (*Vigna unguiculata* subsp. *unguiculata*), Cowpea — Ewa (Nigeria), Kunde (Swahili), Thattapayru (Tamil), Me-karak (Sri Lanka)
10. Cassava (*Manihot esculenta*) — Yucca, Sombe-leaves (Central Africa), Ege, Akpu (Nigeria), Mhogo (Swahili), Mushu (China)
11. Sweet Potato (*Ipomoea batatas*) — Leaves and roots
12. Cabbage (*Brassica oleracea* — Capitata group)
13. Spinach (*Spinacia oleracea*) — Palongshak (Bengali)

This list is not as extensive as it might be because respondents mentioned some other vegetables that were not available at the market. The specific vegetables mentioned by respondents that are not readily available in their area include smooth amaranth, African eggplant, okra, cassava, tossa jute, and bitter leaf (highly medicinal). Respondents frequently mentioned the health implications of vegetables. More than 84% (n=201) had the perception that consumption of vegetables has health consequences (table 4). The respondents said that vegetables are healthy, reduce medical expenses, contain minerals, reduce constipation, and prevent chronic diseases and obesity.

The respondents had the impression that the health implications are directly linked to the quality of the vegetables. The qualities that respondents want in the vegetables they purchase are presented in table 5. Freshness was the main quality that respondents emphasized as being very important to them. The importance of freshness also gives credence to the fact that it will be better if a significant

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for substitutes, there are not many viable substitutions for each.

**Table 4. Perception of Respondents on the Health Implications of Vegetables (N=250)**

Health Implication	Frequency (n / %)
Part of a healthy diet	52 (28.7%)
Leads to lower medical expenses and a good immune system	45 (24.9%)
Contains vitamins, minerals, and proteins	43 (23.8%)
Reduces constipation and is a source of good fiber	36 (19.9%)
Prevents chronic diseases (e.g., cancer, heart problems, blood pressure, diabetes)	32 (17.7%)
Prevents obesity	11 (6.1%)
Leads to healthy skin	9 (5.0%)
Contains antioxidants	8 (4.4%)
Increases lifespan	7 (3.9%)
Contributes to good eyesight	5 (2.8%)

percentage of these ethnocultural foods can be grown in Canada to meet the demand from AC-Canadians and other ethnic groups in the GTA.

The idea of growing locally is reasonable, because consumers were ready to pay more for these vegetables for a number of reasons (table 6). The table shows that the consumers are ready to pay a premium for ethnic vegetables if they are of good quality and taste and if they are part of their staple diet. Their willingness to pay more for ethnic vegetables is also influenced by their availability and freshness, together with the health benefits

**Table 5. Qualities of Vegetables Preferred by Respondents (N=250)**

Quality	Frequency (n / %)
Freshness	167 (72.9%)
Color/texture/physical appearance/quality	78 (34.2%)
Taste	50 (21.8%)
Nutrition	41 (17.9%)
Organic/natural	29 (12.7%)
Price	13 (5.7%)
Varieties	11 (4.8%)

derived from eating vegetables (table 6). These qualities cannot be achieved in Canada unless these crops are grown locally in the summer. Importing these ethnocultural vegetables will lead to reduced quality because of low shelf life and perishability. University of Guelph plant scientist Gopinadhan Paliyath argues that the nutritional value of most vegetables declines markedly five days after they have been picked (G. Paliyath, personal communication, September 2010).

The respondents also asserted that publicity would help to create demand for the availability of their preferred vegetables and to communicate the benefits of consuming these ethnocultural foods. The role of advertising and marketing of ethnocultural foods was deemed relevant by 62% of our respondents. The demand for these crops is so large in the GTA that 21% of our respondents grow ethnic vegetables in their backyards. The vegetables respondents cultivated were tomatoes, smooth amaranth, spinach, and okra. The decision to cultivate these vegetables in their backyards might be due to prices of the commodities or lack of availability.

The financial outcome of demand for these vegetables among AC-Canadians in the GTA was extrapolated from these 250 interviews to CA\$7 million per month, based on their total population

**Table 6. Factors That Can Make Respondents Be Willing To Pay More for Ethnic Vegetables (N=250)**

Factor	Frequency (n / %)
Better quality and/or taste	33 (21.4%)
Staple or part of regular diet	33 (21.4%)
Availability	22 (14.3%)
Freshness	18 (11.7%)
Health benefits	16 (10.3%)
Cultural	11 (7.1%)
Imported from country of origin	10 (6.5%)
Scarcity	7 (4.5%)
Organic	6 (3.9%)
Locally grown	3 (1.9%)



of approximately 400,000. This compares with CA\$33 million per month for the GTA's roughly 800,000 South Asian–Canadians and CA\$21 million per month for its approximately 600,000 Chinese-Canadians (Filson et. al., 2011).

Consumption of ethnic vegetables by AC-Canadians is affected by availability because the respondents either have to look for a substitute such as substituting spinach for amaranth, or else they buy the expensive products that are available. If household income is low, the family will resort to substituting the ethnic vegetable with a non-ethnic vegetable, especially if they have resided in Canada for some time and have become relatively acculturated to the new food system. About 66% (n=159) of the respondents revealed that they spend up to 15% of their total food dollars on vegetables. The issue of unavailability was also emphasized by respondents (see table 7). Close to 40% of the respondents do purchase their ethno-cultural vegetables in specific outlets once they are sure the products they want will be available in those stores. A store that is close to where AC-Canadians live and has most of the preferred vegetables will be highly patronized.

#### *Acculturation*

The ECDAS was used to measure the level of acculturation of AC-Canadians. To ascertain the appropriateness of the scale we tested for reliability (internal consistency); the value of Cronbach's alpha was 0.54. Although the value is not high, the scale is still reasonably reliable. The mean score of each item on the ECDAS scale is presented in table 8. The item with the highest mean score was "I

enjoy speaking English," with a score of 4.42 (with 5 the highest score, "strongly agree"). This may be part of the reason why people of African descent in Canada can purchase in stores where their vegetables are not labelled in their local languages, unlike Chinese-Canadians, for whom "language" is one of the major attributes that affects their decision to purchase ethnic vegetables (Adekunle et al., 2011). Another item that was high on the scale was "I learn a lot from people outside my ethnic group," with a mean score of 4.22. This suggests that AC-Canadians are willing to learn from other ethnic groups' values and norms, which might also include food consumption and acceptability. The items with the lowest scores were "I have difficulty accepting most of the values held by my ethnic group" (mean of 2.22) and "I prefer foods that are not my ethnic foods" (mean of 2.43), indicating that they mostly disagree with these questions. The implications are that no matter how accommodating the respondents are to other ethnic groups' ways of life, they still retain their cultural values and will prefer to consume their own ethnic foods. However, as noted previously, members of the group are generally willing to replace their demand with a close substitute if their actual choice is not available.

**Table 7. Reason(s) Why Consumers Purchase in Specific Outlet (N=250)**

Reason	Frequency (n / %)
Location/proximity	99 (43.6%)
Availability	90 (39.6%)
Price	35 (15.4%)
Freshness	28 (12.3%)
Selection/variety	24 (10.6%)
Quality	22 (9.7%)
Cultural affiliation with store	16 (7.0%)

**Table 8. Acculturation Level of Afro-Caribbean Canadians (N=250)**

Statement	Mean / Standard deviation (where 5 = Strongly agree and 1 = Strongly disagree)
I enjoy speaking English.	4.42 (0.73)
I learn a lot from people outside my ethnic group.	4.22 (0.77)
I enjoy English language movies and TV programs.	4.20 (0.88)
I welcome most of the values held by people outside of my ethnic group.	4.08 (0.83)
Most of my friends are outside my ethnic group.	3.28 (1.17)
I prefer foods that are not my ethnic foods.	2.43 (0.97)
I have difficulty accepting most of the values held by my ethnic group.	2.22 (0.97)

**Table 9. Factors That Underlie Acculturation for Afro-Caribbean Canadians**

Factor	Acceptability of other ethnic foods	Acceptability of other ethnic values	Willingness to speak English
I have difficulty accepting most of the values held by my ethnic group.	<b>0.763</b>	-0.313	0.176
I prefer foods that are not my ethnic foods.	<b>0.778</b>	0.138	-0.078
I welcome most of the values held by the people outside my ethnic group.	-0.126	<b>0.853</b>	-0.004
I enjoy speaking English.	0.051	0.017	<b>0.832</b>

To further understand the relationship between consumption and acculturation, we did a principal component analysis to identify the key variables that underlie acculturation from the seven items on the scale. The scale was tested for sampling adequacy, and a Kaiser-Meyer-Olkin (KMO) of 0.60 indicated adequacy. The Bartlett's test of sphericity was also significant. The analysis also showed that 63.42% of the variation was explained by three components, which are the key variables that underline food acculturation for AC-Canadians (see table 9).

As shown by table 9, it can be deduced that the questions that matter when analyzing the dietary acculturation of AC-Canadians are acceptability of other ethnic foods, acceptability of other ethnic values, and willingness to speak English. The most important item is "acceptability of other ethnic foods," which might be difficult for this group once their ethnic vegetables are available. This is expected because most of the respondents disagree with the statements "I have difficulty accepting most of the values held by my ethnic group" and "I prefer foods that are not my ethnic foods" (refer to table 8).

Acceptability of other ethnic values in terms

of vegetable consumption only prevails when their own ethnic vegetables are unavailable. AC-Canadians are willing to try other vegetables if their cultural vegetables are not available when they agree with two key variables, acceptability of other ethnic values and willingness to speak English, but this only happens when their ethnic vegetables are not available.

Table 10 presents the effect on the mean values of acculturation for the variables of highest education attainment, age, years spent in Canada, household size, and income. Using ANOVA, it was discovered that educational attainment, age, years spent in Canada, and income do not make a significant difference in the mean score of acculturation. However, the mean score of acculturation of different household sizes differ significantly. Thus, households of different sizes also differ in their accul-

**Table 10. Analysis of Variance**

Variables	Degree of freedom	F-Statistics	Sig.
Highest educational attainment <sup>a</sup>	3	0.134	0.940
Age <sup>b</sup>	6	0.399	0.879
Years spent in Canada <sup>c</sup>	5	0.657	0.657
Household size <sup>d</sup>	3	3.576	0.015
Monthly income <sup>e</sup>	6	0.465	0.833

<sup>a</sup> Highest educational attainment was categorized as Primary education; High school; College diploma; University degree.

<sup>b</sup> Age was categorized as less than 20; 21-30; 31-40; 41-50; 51-60; 61-70; 71-80.

<sup>c</sup> Years spent in Canada was categorized as 1-5; 6-10; 11-15; 16-20; 21-25; ≥26.

<sup>d</sup> Household size was categorized as 1-2; 3-4; 5-6; 7-8.

<sup>e</sup> Income was categorized as CA\$1,000-CA\$2,999; CA\$3,000-CA\$3,999; CA\$4,000-CA\$4,999; CA\$5,000-CA\$5,999; CA\$6,000-CA\$6,999; CA\$7,000-CA\$7,999; ≥CA\$8000

turation level. Households with 1 to 2 members had a mean acculturation score of 24.33, those with 3 to 4 members had 25.17, those with 5 to 6 members had 23.74, and those with 7 to 8 members had 20.87. Generally, as the household size increases, the mean score tends to decline. The trend is different for the 3-to-4-member families because most of the respondents in the sample belong to this group. An explanation for this might be that households with smaller size have already assimilated values such as reduction in the number of children, and it is therefore easier for them to accept other values and norms relative to larger households that might be more traditional.

### Discussion

According to WCM Consulting, “The rise in demand for ethnic foods tends to lag behind the rise in the corresponding population. Hence, ethnic markets are somewhat under-served in both the U.S. and Canada and this represents a significant opportunity to meet these demands” (2008, p. 7). In addition, mainstream consumers, as the WCM report concludes, tend to acquire the tastes of relatively newer immigrants over time because they are assumed to be trendy and healthy, adding to the demand for ethnic food.

Despite the growing demand for a greater variety of fruits and vegetables than is presently available, there is little local production of ethnocultural foods in Canada. According to Mike Venton, senior vice president of Loblaw's, Canada's largest food retailer, the company's goal is to be “100 per cent local in season, but Loblaw's can't always meet that target...it's partly a problem of supply” (cited in Flavelle, 2009). Advocates of local food also emphasize the importance of the multiplier effect, whereby money spent within a community improves the community's overall income and economic activity, creating new jobs and better revenue for local farmers. Other benefits of locally produced food include improved human health due to the nutritional value of fresh produce, a reduced impact on the environment, and an increased sense of connectedness within the community (DeWeerd, 2009).

Neff et al. (2009) argue that healthy food is “food high in nutrients and low in calories, fat, sodium, and additives/processed ingredients — particularly fruits and vegetables” (p. 283). These alternative vegetables, popular with Ontario's South Asian, Afro-Caribbean, and Chinese populations, have demonstrated health benefits such as reducing blood sugar and insulinomimetic activity, and therefore could control health problems related to type 2 diabetes (Filson, 2009; G. Paliyath, personal communication, September, 2010). If grown locally, these vegetables and their processed products have much better nutritional quality than imported versions (Paliyath, 2011), and have the potential to be accepted by the mainstream population in their diets.


Not much is known now in Ontario about these cultivars and their local growing requirements, sources of seeds, transplantation methods, nutrition, fertilizer requirements, spacing needs, their local pests, and the yield per acre for these crops. Ontario farmers who presently grow vegetables need to learn how to grow nontraditional, ethnocultural vegetables because these crops can enhance their economic viability while meeting the growing demand for these crops. First, farmers' perceived barriers to production must be identified; then, trials on ECV such as okra, African eggplant, and smooth amaranth should be conducted to help convince farmers to produce for this growing niche market. To some extent this work is already being done by FarmStart, the University of Guelph's Muck Crops Research Centre, Simcoe Research Centre, and Vineland Research Station, but much more needs to be done. It is necessary to determine the effects of different management treatments (e.g., fertilizer, spacing, organic production, and methods for integrated pest management versus conventional pest management) and their impact on post-harvest shelf life, quality, and market potential of each variety of vegetable. There is therefore a strong need for incentives to encourage the production of a wider range of fruits and vegetables.

## Conclusions

There is a very large and unmet demand for ethnocultural vegetables among the GTA's Afro-Caribbean Canadians, and this is no doubt true throughout the country. The same is true among South Asian-Canadians and Chinese-Canadians. Okra, African eggplant, and smooth amaranth are the three vegetables in highest demand. Health benefits such as obesity prevention are the most important reasons for why these vegetables are in high demand, but there are many other reasons as well, including the desire for freshness and familiarity with the variety. If and where possible, farmers producing for local needs should respond to consumers' demand that those vegetables that *can* be produced profitably here *must* be produced here. The benefits of entering this niche market notwithstanding, challenges abound, and are mostly cultural. The situation has led to a new project of understanding the barriers and opportunities in the ethnocultural vegetable market, which we hope will promote the consumption of these vegetables by all Canadians and the active involvement of farmers as this market evolves.

Beyond freshness and the need to retain the health-promoting nutritional qualities that these vegetables only have when fresh there are many other advantages to producing these foods locally, including reducing our carbon footprint, generating additional income for local farmers, and providing the conditions that will enable Canada to be a truly multicultural society while supporting healthy lifestyles for Canadians.

The analysis of the acculturation scale (ECDAS) indicates that AC-Canadians prefer to eat their ethnocultural vegetables if they are available, but are willing to substitute other vegetables. It was also discovered that the themes that underlie the dietary acculturation of AC-Canadians are acceptability of other ethnic foods, acceptability of other ethnic group values and the willingness to speak English. All these attributes are positive for the AC-Canadians, although they prefer their own ethnocultural vegetables even if it is necessary to pay a premium price. Finally, our study also discovered that the mean scores of different house-

hold sizes significantly differ, an indication that household size might be associated with the acculturation level of the main grocery buyer in the household. 

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## References

- Abdel-Ghany, M., & Sharpe, D. L. (1997). Consumption patterns among ethnic groups in Canada. *Journal of Consumer Studies & Home Economics*, 21(2), 215–223. <http://dx.doi.org/10.1111/j.1470-6431.1997.tb00282.x>
- Adekunle, B., Filson, G., & Sethuratnam, S. (2009). *Consumption of ethno-cultural foods: A research guide*. Unpublished manuscript, Guelph, Ontario: University of Guelph. Retrieved from <http://www.scribd.com/doc/46668749/A-GUIDE-to-Ethno-Cultural-Foods-1>
- Adekunle, B., Filson, G., & Sethuratnam, S. (2010). *Preferences for ethno-cultural foods in the Greater Toronto Area (GTA): A market research*. Unpublished manuscript, OMIF/FarmStart/GTAAAC, Guelph, Ontario: University of Guelph. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1738475](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1738475)
- Bentley, S., & Barker, R. (2005). *Fighting global warming at the farmer's market: The role of local food systems in reducing greenhouse gas emissions*. Toronto, Ontario: Foodshare Toronto. Retrieved from <http://www.foodshare.net/resource/files/foodmilesreport.pdf>
- Berry, J. W. (1980). Acculturation as varieties of adaptation. In A. M. Padilla (Ed.), *Acculturation: Theory, models and some new findings* (pp. 9–25). Boulder, Colorado: Westview.

- Bojanic, D., & Xu, Y. (2006). An investigation of acculturation and dining-out behaviour of Chinese living in the United States. *International Journal of Hospitality Management*, 25(2), 211–226. <http://dx.doi.org/10.1016/j.ijhm.2005.06.002>
- Bordelon, B., Browning, T., & Wagner, C. (1996). Establishing new crop industries: The Indiana wine and grape model. In J. Janick, (Ed.). *Progress in New Crops* (pp. 137–140). Alexandria, Virginia: ASHS Press. Retrieved from <http://www.hort.purdue.edu/newcrop/proceedings1996/v3-137.html>
- Cerkauskas, R. F., Stobbs, L. W., Lowery, D. T., Van Driel, L., Liu, W., & VanSchagen, J. (1998). Diseases, pests, and abiotic problems associated with oriental cruciferous vegetables in southern Ontario in 1993–1994. *Canadian Journal of Plant Pathology*, 20(1), 87–94. <http://dx.doi.org/10.1080/07060669809500449>
- Cleveland, M., Laroche, M., Pons, F., & Kastoun, R. (2009). Acculturation and consumption: Textures of cultural adaptation. *International Journal of Intercultural Relations*, 33(3), 196–212. <http://dx.doi.org/10.1016/j.ijintrel.2008.12.008>
- D’Astous, A., & Dagbfous, N. (1991). The effects of acculturation and length of residency on consumption-related behaviours and orientations of Arab-Muslim immigrants. In T. Schellinck, (Ed.). *Proceedings of the Annual Conference of the Administrative Sciences Association of Canada, Marketing Division* (pp. 91–101). Niagara Falls, Ontario.
- Dato-on, M. (2000). Cultural assimilation and consumption behaviors: A methodological investigation. *Journal of Managerial Issues*, 12(4), 427–445.
- Davidson, K. (2011). Growers bring home vegetables from the global village. *The Grower*, 61(5), 1–3.
- DeWeerd, S. (2009). Local food: The economics. *World Watch*, 22(4), 20–24.
- Donald, B. (2009). *From kraft to craft: Innovation and creativity in Ontario’s food economy*. Toronto, Ontario: Martin Prosperity Institute, University of Toronto. Retrieved from [http://www.fifthtown.ca/files/From\\_Kraft\\_to\\_Craft-B\\_Donald.pdf](http://www.fifthtown.ca/files/From_Kraft_to_Craft-B_Donald.pdf)
- Donald, B., & Blay-Palmer, A. (2006). The urban creative-food economy: Producing food for the urban elite or social inclusion opportunity? *Environment and Planning A*, 38(10), 1901–1920. <http://dx.doi.org/10.1068/a37262>
- Dwyer, C., & Jackson, P. (2003). Commodifying difference: Selling EASTern fashion. *Environment and Planning D: Society and Space*, 21(3), 269–291. <http://dx.doi.org/10.1068/d349>
- FarmStart. (n.d.) Supporting a New Generation of Farmers. Retrieved from <http://www.farmstart.ca/>
- Filotas, M., Todd, J., Wedsterveld, S., & Prinold, H. (2009). *Growing non-traditional crops in Ontario*. Ontario: Agricultural Information Contact Centre, Order No. 09-043W, AGDEX 268. Retrieved from <http://www.omafra.gov.on.ca/english/crops/facts/09-043w.pdf>
- Filson, G. C. (2011, May 9). *Creating awareness about the demand for locally produced ethno-cultural vegetables: Discovering barriers and opportunities to this niche market’s entry*. University of Guelph/OMAFRA, Knowledge Translation and Transfer Program Annual (Final Project Report). Guelph, Ontario: University of Guelph. Retrieved from [http://www.uoguelph.ca/research/omafra/partnership/KTT\\_Program/Executive%20Summaries/Fall%20Call/Filson.pdf](http://www.uoguelph.ca/research/omafra/partnership/KTT_Program/Executive%20Summaries/Fall%20Call/Filson.pdf)
- Filson, G. C. (2009) *Food for health proposal: Production of alternative vegetable crops with health promoting qualities: Perception and marketing, product development and enhancement*. Unpublished manuscript, University of Guelph, Guelph, Ontario.
- Filson, G. C., Adekunle, B., & Sethuratnam, S. (2011). *Exploring the demand for culturally appropriate foods: Preferences for ethno-cultural vegetables in the greater Toronto area*. Guelph, Ontario: FarmStart. Retrieved from <http://www.farmstart.ca/wp-content/uploads/Growing-International-EthnoVeg-6.pdf>
- Flavelle, D. (2009, September 7). Loblaw thinking locally: Aims to grow amount of Ontario produce in its supermarkets. *The Toronto Star*. Retrieved from <http://www.thestar.com/article/691775>
- Foodlink Waterloo Region. (n.d.). *Foodlink Waterloo Region*. Retrieved from <http://www.ohpe.ca/node/9555>
- Govindasamy, R., Sciarappa, W., Puduri, V. S., VanVranken, R., Ayeni, A., Pappas, K., ... McAvoy, G. (2007). A market driven approach to ethnic crop production for the US East Coast. In J. Janick & A. Whipkey (Eds.). *Issues in new crops and new uses: Proceedings of the Sixth National Symposium Creating Markets for Economic Development of New Crops and New Uses* (pp. 261–273). Alexandria, Virginia: ASHA Press.

- Gregson, N., Crewe, L., & Brooks, K. (2002). Shopping, space, and practice. *Environment and Planning D: Society and Space*, 20(5), 597–617. <http://dx.doi.org/10.1068/d270t>
- Gren, C. (1999). Ethnic evaluations of advertising: Interaction effects of strength of ethnic identification, media placement, and degree of racial composition. *Journal of Advertising*, 28(1), 49–59.
- Gunst, J., Jaque, G., Jurgens, B., & McDowell, T. (2010). *The inclusion of ethnic produce in Waterloo region food system*. Unpublished manuscript, Geography 429, University of Guelph, Guelph, Ontario.
- Hamlett, J., Bailey, A. R., Alexander, A., & Gareth, S. (2008). Ethnicity and consumption: South Asian food shopping patterns in Britain, 1947–75. *Journal of Consumer Culture*, 8(1), 91–116. <http://dx.doi.org/10.1177/1469540507086037>
- Herche, J., & Balasubramanian, S. (1994). Ethnicity and shopping behaviour. *Journal of Shopping Centre Research*, 1(1), 65–80.
- Jackson, P. (2002). Commercial cultures: Transcending the cultural and the economic. *Progress in Human Geography* 26(1), 3–18. <http://dx.doi.org/10.1191/0309132502ph254xx>
- Jackson, P., Perez del Aguila, R., Clarke, I., Hallsworth, A., de Kervenoael, R., & Kirkup, M. (2006). Retail restructuring and consumer choice 2. Understanding consumer choice at the household level. *Environment and Planning A*, 38(1), 47–67. <http://dx.doi.org/10.1068/a37208>
- Jamal, A., & Chapman, M. (2000). Acculturation and inter-ethnic consumer perceptions: Can you feel what we feel? *Journal of Marketing Management*, 16(4), 365–391. <http://dx.doi.org/10.1362/026725700784772853>
- Lammers-Helps, H. (2010, March/April). News & Notes: Local, supermarket prices closer than thought. *Small Farm Canada*.
- Laroche, M., Chankon, K., & Hui, M. (1997). A comparative investigation of dimensional structures of acculturation for Italian Canadians and Greek Canadians. *The Journal of Social Psychology*, 137(3), 317–331. <http://dx.doi.org/10.1080/00224549709595443>
- Lee, W., & Tse, D. K. (1994). Changing media consumption in a new home: Acculturation patterns among Hong Kong immigrants to Canada. *Journal of Advertising*, 23(1), 57–70.
- Marzall, K., Filson, G., & Adekunle, B. (2011). Multifunctionality, environmental security and strong sustainability. In G. Filson (Ed.). *Agriculture and environmental security in Southern Ontario's watersheds* (pp. 17–35). Hauppauge, NY: Nova Science Publishers.
- McAvoy, G. (2008, December 19). Ethnic vegetable markets growing rapidly. *Southeast Farm Press*. Retrieved from <http://southeastfarmpress.com/vegetables/ethnic-vegetable-markets-growing-rapidly>
- Miller, D., Jackson, P., Thrift, N., Holbrooke, B., & Rowlands, M. (1998). *Shopping, place and identity*. London, UK: Routledge.
- Neff, R. A., Palmer, A. M., McKenzie, S. E., & Lawrence, R. S. (2009). Food systems and public health disparities. *Journal of Hunger & Environmental Nutrition*, 4(3–4), 282–314.
- Paliyath, G. (2011, March 25). Health Benefits and Shelf Life of ECVs. Retrieved from <http://www.youtube.com/watch?v=ZCrisuPv6X0&feature=related>
- Penaloza, L. (1994). Atravesando fronteras/border crossings: A critical ethnographic exploration of the consumer acculturation of Mexican immigrants. *Journal of Consumer Research*, 21(1), 32–54. <http://dx.doi.org/10.1086/209381>
- Satia, J. A., Patterson, R. E., Kristal, A. R., Hislop, T. G., Yasui, Y., & Taylor, V. M. (2001). Development of scales to measure dietary acculturation among Chinese-Americans and Chinese-Canadians. *Journal of the American Dietetic Association*, 101(5), 548–553. [http://dx.doi.org/10.1016/S0002-8223\(01\)00137-7](http://dx.doi.org/10.1016/S0002-8223(01)00137-7)
- Simon, H. A. (1955). A behavioral model of rational choice. *The Quarterly Journal of Economics*, 69(1), 99–118. <http://dx.doi.org/10.2307/1884852>
- Stevens, N. (2008). *Controlling our food supply*. CFFO Seminar report 2008, Guelph, Ontario, Christian Farmers Federation of Ontario.
- Tajfel, H. (1981). *Human groups and social categories: Studies in social psychology*. Cambridge, UK: Cambridge University Press.
- Wang, L., & Lo, L. (2007). Immigrant grocery-shopping behavior: Ethnic identity versus accessibility. *Environment and Planning A*, 39(3), 684–699. <http://dx.doi.org/10.1068/a3833>

Webster, C. (1994). Effects of ethnic identification on marital roles in the purchase decision process. *Journal of Consumer Research*, 21(2), 319–331.  
<http://dx.doi.org/10.1086/209400>

WCM Consulting, Inc. (2008). *Strengths, weaknesses, opportunities, and threats: Analysis of the ethnic food sector in Ontario*. Prepared for Agriculture and Agri-Food Canada, Sharon, Ontario. Retrieved from <http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1227223497653&lang=eng>

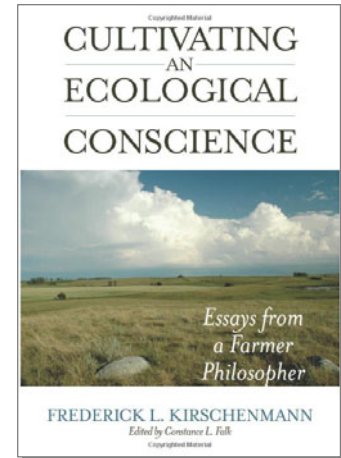




## A better philosophy for the food movement

### Book Review: *Cultivating an Ecological Conscience: Essays from a Farmer Philosopher*, by Fred Kirschenmann and edited by Constance L. Falk

Review by Eliav Bitan



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National Public Radio’s “Morning Edition” program was brought to me this morning by “Monsanto: helping farmers around the world be more sustainable.” From multinational corporations like Monsanto to the vegetable farmer at my farmers’ market, everyone in the agriculture field wants to talk about sustainability. What does sustainable mean? Do humans influence the environment, or are humans and the environment

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Eliav Bitan has worked on farms in Maine, Pennsylvania, and Iowa, and has a degree in history of science with a focus on environmental biology from Columbia University. He has worked on agriculture and climate change policy across the United States by engaging with farmers, researchers, regulators and activists. He has previously written for the Columbia University *Undergraduate Journal of History*, Celsias.com and is co-author of the National Wildlife Federation’s report, *Future Friendly Farming: Seven Agricultural Practices to Sustain People and the Environment*. The views expressed in this review are the author’s alone and do not represent the National Wildlife Federation or any other organization.

constantly influencing each other? When farmers say they “know” how to farm, what kind of knowledge is that? Is that knowledge drawn from years of experience, or from scientific experiment?

Philosophers ask these basic questions about assumptions and knowledge. Fred Kirschenmann has explored how philosophical questions relate to farming in an extraordinarily sensitive, thorough manner, over 40 years of writing, speaking and leadership. In *Cultivating an Ecological Conscience*, essays and lectures from a broad range of events, journals, and forums come together to form a remarkably cohesive whole.

The essays are always rooted in agricultural practice. For example, one powerful element of sustainable agriculture to which Kirschenmann returns repeatedly is integrating animal and crop production systems. He writes, for example,

Our 3100 acre [1250 hectare] grain and livestock farm has 114 beef brood cows. The beef cattle are fully integrated into the cropping system. We feed our cattle no cash grain, only forages and crop residues. We generate, on average, [US]\$300,000 gross revenue annually, and we haven't borrowed any operating funds in twenty years. (p. 64)

This is classic Kirschenmann. You can almost smell the manure. And he makes his argument in terms that any farmer can understand: dollars and cents. For decades, conservationists have been discussing the improvements to soil and water that come when forage crops like alfalfa are included in a rotation. Kirschenmann seems to have the most effective way to make that argument: from his own farming experience, in hard economic terms. He asks in almost every essay in this book, "how does all of this knowledge apply to my farm in North Dakota, or to farms in Iowa?" Kirschenmann's farming experience makes his lament all the more powerful when he bemoans that "we know almost nothing about the ecological wealth, encapsulating our farms in the form of various natural organisms, that could be linked to biological synergies that could drive our productivity" (p. 98). The loss of biological wealth is not an abstract concern in these essays, but rather a very financial damage to farmers. Perhaps this practical wisdom is why Kirschenmann has been so effective in creating and leading sustainable agriculture groups, from the Northern Plains Sustainable Agriculture Society to Agriculture of the Middle, and from the Leopold Center for Sustainable Agriculture to the Stone Barns Center for Food and Agriculture.

It is cliché to complain about information silos, where farmers and researchers do not share their unique knowledge with each other. All the organizations Kirschenmann has been involved in have sought to connect on-farm knowledge with research and policy. For example, he repeatedly mentions how he increased production without new costs by growing wheat and flax together on his farm, rather than as monocultures. He relates this to an article in the journal *Science* about a

research experiment using a similar principle with rice production in China. In each case, the secondary crop adds about 20% to the production of the field. In the rice example, the increased diversity protects the crop from a potent fungus, enabling farmers to give up the use of an expensive, toxic chemical.


Throughout his essays, Kirschenmann retains a focus on the philosophical issue he studied and taught as an academic. Readers are just as likely to enjoy an explanation of the late-nineteenth century German philosopher Edmund Husserl as contemporary scientific literature. From his discussion of crop mixing, Kirschenmann deftly maneuvers to philosophical ideas about "nature." When nature is viewed as pristine and impractical, farmers and researchers alike fail to see value in the diversity of a natural system. Instead, they focus on artificial monocultures. Kirschenmann brings this philosophical idea directly to bear on our nation's agriculture policy. He is proud of his work in the federal Sustainable Agriculture Research and Education (SARE) program to propose more interactions between farmers and researchers. And he wishes there were more policy support for such integration.

While Kirschenmann's specific policy proposals, like increasing SARE funding, are not uncommon throughout the book, they are better in the later pieces. In 1978, two years after quitting his promising career as a professor to return to his family's farm in North Dakota, Kirschenmann spoke at an informal gathering of organic farmers. He sketched out the dismal state of current farm economics, where he lost money on each bushel of wheat he grew. He compared farmers' failure to diversify their operations and build soil organic matter to the practices that caused the ecological devastation of the Dust Bowl in the 1930s. And he tried to propose a solution: a soil depletion tax credit modeled after the oil depletion tax credit given to large oil companies. This obscure policy proposal, developed by University of Missouri soil scientist William Albrecht in 1955, garnered little support. The reader is challenged to understand how such a policy would work.

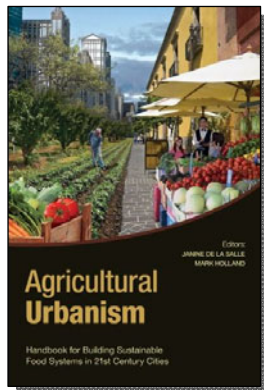
In contrast, in a 1999 talk in Lincoln, Nebraska, Kirschenmann presciently highlighted the trend for farmers to become contract workers for their “customers.” He noted the broiler industry, where farmers often contract with consolidated processing companies to ensure a customer for their products. These contract farmers find their entire operations dictated by their buyers, with none of the independence Kirschenmann and other farmers value so much. Kirschenmann is concerned that grain farmers will grow products genetically engineered for such specific end uses that they will similarly become beholden to their buyers. He advocates instead for “some kind of universal collective bargaining” (p. 158). He compares current farm groups to unions: “Airline pilots never use their union dues to get more people to fly. They use them to get a fairer share of transportation profits” (p. 158). In contrast, farmer check-off

programs try to increase demand for farm products, and farmer groups reliably talk about increasing production to feed the world.

Kirschenmann suggests that commodity groups should instead bargain with processors, wholesalers, and retailers for a greater share of food spending. Currently, farmers receive 8 cents of every dollar spent on food. How could this amount increase?

After reading *Cultivating and Ecological Conscience*, I could not help but wonder how the food movement would look if this were its primary text, rather than Michael Pollan’s *The Omnivore’s Dilemma*. Might we be more understanding of, and interested in, farming itself? Might we focus more on deeper philosophical issues at the root of our agricultural system? 





## Planning urban foodscapes

### Book Review: *Agricultural Urbanism: Handbook for Building Sustainable Food Systems in 21st Century Cities*, edited by Janine de la Salle and Mark Holland

Review by Nevin Cohen, The New School

De la Salle, J., & Holland, M. (Editors). (2010). *Agricultural Urbanism: Handbook for building sustainable food systems in 21st century cities*. Winnipeg, Manitoba, Canada: Green Frigate Books.

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One of the most exciting new areas of planning and development involves innovative strategies to reintegrate food production and distribution into our communities. *Agricultural Urbanism*, edited by senior planners at HB Lanarc, a Vancouver-based planning and design firm, is a collection of planning, policy, and design concepts to do just that. The book outlines a program — a manifesto, really — for “building a place around food” (p. 9). This requires rethinking the role of food in cities, transforming the messy elements of food production and processing functions that have been relegated to the “back of the house” to the “front of the house,” and making food systems visible in communities so that people become reconnected to the sources of their food and better understand the nature of food production. In describing the contours of agricultural urbanism, the authors ambitiously discuss the whole gamut of the food system, including food access, the food

economy, infrastructure, education, place-making, policy, and environmental protection.

Urban planners and landscape architects will recognize many of the ideas in *Agricultural Urbanism* from the works of William H. Whyte, Donald Appleyard, Jahn Gehl, and more recently, Andre Viljoen. Designing eating and drinking opportunities into the streetscape, integrating productive edible landscapes, using stormwater for agricultural irrigation, and designing interpretive signage and other features to connect people to food at the streetscape, are all concepts that urban theorists have written about for decades. The concepts of agricultural urbanism have been implemented in various contexts ranging from festival retailing projects to green infrastructure plans. Cities like Seattle have integrated urban agriculture into a wide range of projects; Toronto is experimenting with neighborhood food production hubs for

economic development; and New York is innovating with rooftop farming. The authors have drawn on these precedents, added their professional experiences, and wrapped the ideas together into a framework that is easy to understand and apply, much like the principles of *New Urbanism* that define mixed-use, walkable communities that embody traditional neighborhood design.

In fact, *Agricultural Urbanism* uses the New Urbanist concept of the *transect*, or the gradient from rural to urban, to identify appropriate forms and scales of food production systems that can be integrated into the landscape, from the most rural communities to dense downtowns. At the rural edge, this might take the form of new clustered residential, commercial, and processing facilities that enable farmers to interact, more efficiently share equipment and facilities, and improve their productivity. In suburbia, agricultural urbanism might involve the integration of residential subdivisions and small-scale farms, such as Prairie Crossing, the suburban Chicago residential development that includes 40 acres of farmland.<sup>1</sup> At the urban end of the transect, in center cities filled with high rises, agricultural urbanism might include networks of window-boxes, community gardens, and rooftop farms that enable apartment dwellers to grow some of their own food.

In presenting a broad range of ideas, *Agricultural Urbanism* provides policymakers and planners with a framework for thinking comprehensively and holistically about food in their day-to-day duties. The book provides a rich conceptual overview, though practitioners will need to consult other resources for the financial, technical, and logistical details needed to design and implement specific projects. For example, a statement that the production of local foods reduces transportation-related energy use (p. 39) fails to explain that the energy efficiency of food production and transportation depends on much more than proximity, as a recent

USDA report has shown.<sup>2</sup> A recommendation to retrofit industrial buildings to support rooftop farming (p. 42) may be overstating the possibilities given the substantial costs of reinforcing roofs, installing growing media, and the limitations of growing food on windy, dry, hot rooftops with shallow soil. A suggestion based on a case study of a particular Vancouver urban farmer that urbanites have “access to cheap land” (p. 165) does not apply to those in built-out cities. The idea that more “benign growing conditions...with fewer wild pests and built-in wind protection” (p. 166) minimizes the substantial challenges of urban agriculture, from desiccating wind on rooftops to relatively high water costs compared to rural farmers. More careful analysis and better attention to source material would make the arguments in the book much more compelling.

Some of those details are, in fact, critical for building support for agricultural urbanism. Without that level of detail, many policymakers and citizens will remain skeptical that food production and development fit together, viewing the incorporation of farms in subdivisions as only marginally better than the golf courses that anchor many suburban communities. The need for better data about the benefits of agricultural urbanism, lessons learned from existing projects, and the critical assessment of its limits would help to build support for these projects. This has become particularly clear in the case of the Southlands project in the town of Tsawwassen, British Columbia, Canada, a proposed agricultural urbanism development described in great detail in the book that has yet to come to fruition. The Southlands project would have converted a 536-acre tract of former agricultural reserve land into an integrated residential, commercial, and food-growing community. The editors and their colleagues at HB Lanarc ran design charrettes (described in chapter 17) involving community visioning, site inventory and analysis, typology development, conceptual design,

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<sup>1</sup> Cohen, N. (2007). The Suburban Farm: An innovative model for civic agriculture. *Urban Agriculture Magazine*, 19, 55–57. Available at <http://www.ruaf.org/book/export/html/101>

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<sup>2</sup> Canning, P., Charles, A., Huang, S., Polenske, K. R., & Waters, A. (2010, March). *Energy use in the U.S. food system* (Economic Research Service report ERR-94). Washington, D.C.: U.S. Department of Agriculture.

and site design. While the idea of a mixed-use agricultural urban community was well received early in the process, over time public opposition to developing the site has grown among those concerned about losing the land to housing and commercial buildings. On October 6, 2011, the local council received a new application for the project, triggering an additional public consultation process.

Whatever the fate of Southlands, *Agricultural Urbanism* remains an intriguing and important idea that is likely to be adopted more broadly as communities seek to address issues of climate change, food security, and urban sustainability. For this reason, developers, architects, planners, and city officials will want to understand the concepts explored in this handbook and keep a copy on their shelves. 