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Urban Food Networks

CONTENTS

University Influence in Urban Food Systems

Guest Editor Julie M. Fox

Introduction

Food systems have a great bearing on the quality of urban life (Pothukuchi & Kaufman, 1999). Urban university influence on food systems begins at the highest levels and is strengthened by the collaborative commitment of diverse stakeholders. Because of critical factors such as food security, potentially polarizing assumptions, and multiple stakeholder agendas inherent in food systems, urban universities are uniquely positioned to provide a foundation to advance learning and developments needed to make a significant difference in urban food systems. Entire urban university communities, with a multitude of internal and external influences, are addressing food system opportunities and challenges at local, regional, and global levels.

A variety of literature examines and portrays food as a complex interplay of cultural, economic, social, political, and technological forces (Kniazeva & Venkatesh, 2007). To address this complexity, urban university faculty, staff, and students are engaging with a variety of local community partners, neighborhood residents, global industry collaborators, alumni, donors, the media, and other public and private stakeholders. In addition to focusing on the fundamental need of feeding the growing world population, urban universities are recognizing the value of individual expertise and the collective capacity to nourish the people, the environment, and the economy.

Diverse perspectives have led to definitions of food systems that often include descriptors such as local, regional, global, community, sustainable, resilient, inclusive, equitable, healthy, or culturally relevant. Each of the terms carries specific meaning and context. Across campus, initiatives and conversations about food have the capacity to bring out the full potential of the university. From dining services and real estate to academic units, student life, advancement, engagement, and public relations, urban universities influence urban food systems.

Food systems feature characteristics of a complex adaptive system, both in structure and effects (Nesheim, Oria, & Yih, 2015). In addition to single-factor interests, transdisciplinary investigation of food systems have progressed beyond compartmentalized approaches to explore multi-dimensional aspects, such as the

- National Science Foundation (NSF) investment of $72 million for innovations at the nexus of food, energy, and water systems;
- Association of Public and Land-grant Universities (APLU) Healthy Food Systems, Healthy People initiative linking research, Extension, and academic programs that focus on integrating nutrition, health, environment, and agricultural systems;
- United Nation HABITAT's World Urban Campaign that provides insight on food security and sustainable urban development; and
- The Food and Agriculture Organization of the United Nation's Food for the Cities community of practice with more than 2,500 members from 114 countries.

Article Overview

This themed issue of *Metropolitan Universities* journal illustrates how urban universities lead and contribute to food system teaching and learning; research and innovation; outreach and engagement; and resource stewardship. The articles address multifaceted issues of food security, policy, production, culture, and justice. Common themes emerging in this issue include the

- essential approach of collaboration;
- value of diverse voices and perspectives;
- influence of distinct urban contexts; and
- complexity of food system issues.

In the first article, "Planning for Food Systems: Community University Partnerships for Food System Transformation," authors Whittaker, Clark, SanGiovanni, and Raja, make a case for deliberative food-system planning and policy rooted in collaborative and diverse partnerships that span public, civic, and private sectors. They emphasize that urban universities have both the responsibility and extraordinary opportunity to be a force of transformation in creating equitable community food systems by harnessing the integrated power of research, education, and civic engagement. Their article illustrates the growth of food system education in the United States. They present two community university partnership projects in New York, providing urban and rural context. In the article, they discuss their participatory action research framework and summarize lessons learned about university collaborations in communities where they are not embedded.

Food systems and urban environments have shifted over time, as detailed in the "Farming Chicago" article. Rosing and Block explore higher education's role in food systems in Chicago, the third largest city in the United States. Numerous examples demonstrate how individual urban universities and multi-institutional projects are building on the city's extensive history of food production, advocacy, policy, and planning. One example includes development of the Chicago Higher Education Sustainable Food Systems Network of university, community college, and technical school faculty and staff in the metropolitan area. Another asset-based approach to food system support is the Chicago Urban Agriculture Mapping Project that provides a public resource which also supports student learning and faculty research. In addition to collaborative research and community engagement, universities are working together on community-engaged curriculum that improves access to knowledge resources, technical assistance, direct research support, and certificate and degree programs. The deep history, current priorities, and vast network of players in the city, presents both opportunities and challenges as urban universities consider the large role they play in the local food system, as researchers, educators, community conveners, food buyers, and more.

To better understand food-system change and inform food-system improvement efforts, Neff, Laestadius, DiMauro, and Palmer report on how oral history interviews with low-income, older adults near John Hopkins University in Baltimore, Maryland were used as a teaching tool in an eight-week graduate course. As a result of this qualitative research, often marginalized voices were recognized, valued, and included in the discussion of priorities as food systems and urban environments continue to change. Lessons learned extend beyond the initial investigation objectives, to include the value of student engagement with older adults in the community.

Reaffirming the land-grant mission, the University of the District of Columbia is building economic development capacity and quality of life in underserved neighborhoods through Urban Food Hubs of the College of Agriculture, Urban Sustainability, and Environmental Sciences (CAUSES). O'Hara reports these Urban Food Hubs engage local partners and are designed to improve access to fresh food, address health deficits, and create jobs. Each of the five Urban Food Hubs addresses unique characteristics of the community and consists of urban food production, food processing, food distribution, and the management of waste and water. In addition to academic degree seeking students, CAUSES reaches a large number of non-degree-seeking students through workforce development, certificate programs, and continuing education programs. While impact measures are still to be defined, this intense focused approach serves as a model for other urban serving universities interested in contributing to the triple bottom line of economic, social, and environmental conditions.

In the case study about the Ohio State University, Fox analyzes the institution's collective approach to urban food systems. Food-system components explored in this qualitative research included teaching and learning; research and innovation; outreach and engagement; and resource stewardship. Findings from this study indicate considerable collaborations, emerging impacts, natural tensions, and ongoing opportunities to continue maximizing university resources to advance the complex sustainable urban food system agenda. Discoveries from this interpretive analysis can guide urban university leaders, from small and large institutions, to collectively make strategic investments aligned with all aspects of the university's mission.

The book bibliography by Ritchie offer perspectives for a variety of urban university decision makers interested in urban agriculture, designing food spaces, and sustainability on campus. The reviews highlight the newest research and practical recommendations to meet growing expectations of the campus community to include urban food-system concerns in research, teaching, and service, as well as the overarching sustainability efforts of the university.

Conclusion

Urban university involvement in food systems is significant to sustainable urbanization. The articles for this issue of *Metropolitan Universities* journal were selected to provide a variety of perspectives for urban university leaders to better understand the broad scope of food systems and related factors. Some of the studies focus on specific university solutions to community challenges, while others illustrate comprehensive approaches to food-system developments. Authors share the importance of diverse perspectives and collaborative approaches. They address distinct urban contexts and the complex nature of food-system issues. All of the articles include constructive conclusions and applicable resources. Relevant insight can benefit all urban university leaders.

This issue of the journal can be used to create conversation around related topics. For example, a viable urban ecosystem extends beyond food systems to other issues that are closely related, such as rain-water and storm-water management; community green space; energy and material flow; and the integration of ecological, economic, social and human health factors (Barthel, Parker, & Ernston, 2013; Decker, Elliott, Smith, Blake, & Rowland, 2003; Su, Fath, & Yang, 2010). Members of the Coalition of Urban and Metropolitan Universities (CUMU) can use these articles to reflect on current understanding and encourage one another to better appreciate and build upon

the impacts, face the challenges, and create new ways to come together to improve the many aspects of urban food systems. Sustainable urban universities and sustainable communities depend on it.

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Resources

Association of Public and Land-grant Universities (APLU) Healthy Food Systems, Healthy People, http://www.aplu.org/projects-and-initiatives/agriculture-human-sciences-and-natural-resources/healthy-food-systems-healthy-people

National Science Foundation (NSF) investment of $72 million for innovations at the nexus of food, energy, and water systems, https://foodenergywater.wordpress.com/category/infews

The Food and Agriculture Organization of the United Nation's Food for the Cities Initiative community of practice, http://www.fao.org/fcit/fcit-home/en

United Nation HABITAT's World Urban Campaign, http://unhabitat.org/urban-thinkers-the-city-we-need

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Planning for Food Systems: Community-University Partnerships for Food-Systems Transformation

Jennifer Whittaker, Jill K. Clark, Sarah SanGiovannni, and Samina Raja

Abstract

The United Nations estimates that by 2050, more than 66% of the world's population will live in urban areas. In the face of continuing urbanization, how will communities meet the fundamental need for good food? What kinds of public policies, structures, and systems will ensure equitable and just access to food? We argue that urban universities have a responsibility and an extraordinary opportunity to help create equitable community food systems by amplifying community-led planning and policy to strengthen such systems. Drawing on case studies involving the University at Buffalo State University of New York system and its community partners, we describe the ways in which community-university partnerships can leverage policy change to support stronger food systems. We conclude with lessons for such partnerships: the importance of building lasting relationships for policy change, shoring up community capacity, understanding the benefits and burdens for universities and communities, and reimagining universities' responsibilities to their regions.

Keywords
Community-university partnerships, Buffalo, Chautauqua, Urban planning, Regional planning

Introduction

The United Nations estimates that by 2050, more than 66% of the world's population will live in urban areas (United Nations, 2014). This urbanization will be accompanied by extraordinary challenges and opportunities. The impact of urbanization will be especially evident in community food systems, or the soil-to-soil network that enables food to be grown, processed, distributed, and delivered to urban residents. Even today, communities' food systems are failing to keep up with societal needs. Globally, 793 million people were estimated to be chronically undernourished in 2015, with most food insecurity concentrated in developing countries (FAO, IFAD, & WFP, 2015). The food systems of more industrialized nations are not serving people well, either. Many countries are facing the twin challenges of prevalent food insecurity and a rise in diet-related chronic disease, often concentrated in the same neighborhoods and population groups. In the United States, for example, 14% of households were estimated to be food insecure in 2014 (Coleman-Jensen, Gregory, & Singh, 2015). How will communities meet the fundamental need for good food, in the face of continuing urbanization? What kinds of public policies, structures, and systems will ensure equitable and just access to food? Urban universities have the choice to purposefully engage with, react to, or remain apathetic to these questions.

We argue that urban universities have a responsibility and an extraordinary opportunity to help create equitable community food systems, especially by amplifying community-driven efforts to transform local government planning and policy to strengthen such systems. Such deliberative food-systems planning and policy is a fairly new practice within the profession of urban and regional planning, although local governments have increasingly begun to use planning and policy to shore up food systems (Raja & Diao, 2016). We define food-systems planning as a set of future-oriented, place-based, and dynamic activities that strengthen a community's food system through the creation and implementation of community plans and policies, which are often but not always recognized or led by local and regional governments (Raja & Whittaker, Forthcoming). Individuals and organizations engaged in food-systems planning identify the opportunities and challenges within communities' food systems, gather input from stakeholders and deliberate on the best responses to challenges, and facilitate and implement actions to improve the systems. In a well-functioning system, *all* community residents can be food secure, farmers, food entrepreneurs, and employees can have economically secure livelihoods, and food is produced with environmentally sustainable practices (Raja & Whittaker, Forthcoming). At its best, food-systems planning and policy processes are rooted in collaborative and diverse partnerships that span the public, civic, and private sectors (Raja, Hoekstra, Delgado, & Veenhuizen, 2016).

Urban universities can play an important role as partners by harnessing the integrated power of research, education, and civic engagement to shore up communities' food-systems planning and policy processes (Clark et al., 2015). Many urban universities are located, and embedded as anchor institutions, in communities where the fault lines within food systems are most exposed. Indeed, many are stepping up to help rebuild sustainable food systems. A recent study maps the many ways in which universities have begun to engage in the sustainable food-systems movement, through curricula, establishment of on-campus community gardens, farmers' markets, and other activities (Kameshwari Pothukuchi & Molnar, 2014). Few of these activities, however, explicitly focus on creating, amplifying, or buttressing plans and policies that can create more equitable food systems. We argue that urban universities are well-positioned to help, and responsible for helping rebuild food systems through community-university partnerships focused on food-systems policy and planning. University support for food-systems policy and planning is especially important, because community food advocates and food entrepreneurs have neither the mandate nor the resources to pursue policy change. Moreover, short-sighted policies often constrain community advocates and entrepreneurs seeking to rebuild food systems. For this reason, we argue that universities can play an important role in amplifying and supporting community-led policy processes to create more just food systems.

We draw on the experiences of the University at Buffalo (UB) State University of New York (SUNY) system and its community partners, to describe ways in which community-university partnerships can leverage policy change to support stronger food systems. UB is the largest and most comprehensive research institution within the public SUNY system (The State University of New York), the largest university system in the U.S., and is home to 13 schools and colleges, including SUNY's only School of Architecture and Planning, the locus of the work described in this article. UB enrolls nearly 30,000 students in undergraduate, graduate, and professional programs (University at Buffalo, The State University of New York). Although numerous academic units and faculty at UB are involved in food-related scholarship, teaching, and civic

engagement, this paper focuses on the community-based food-systems planning and policy efforts of the School of Architecture and Planning.

Engaging in Food-Systems Planning and Policy Through Education

The planning profession aims to create places where people can lead healthy, full lives (Raja, Born, & Kozlowski Russell, 2008). Planners shape land use, housing, economic development, community development, and, increasingly, community food systems. Until the early 2000s, similar to the food-blind manner in which planning was practiced, university education for planners neglected concerns about the food system. In 2004, only nine programs in the country were reported to offer a course on food-systems planning (Hammer, 2004). Following recent trends in communities and professional planning, university planning programs are increasingly teaching about food (Greenstein, Jacobson, Coulson, & Morales, 2015).

In 2013, the authors conducted a survey of the 73 accredited planning programs in the United States, to gauge their offerings for food-systems planning education. The survey was conducted by telephone. Initial phone calls were made to staff members in departmental offices. Depending on the recommendations of departmental staff, follow-up calls were directed to chairs of departments, administrative professionals, planning faculty, or alternative staff members. Each planning program was called up to three times. Fifty-five of the 73 programs responded.

Findings from the 2013 survey suggest a great deal of variation in the extent to which food is being integrated into planning curriculum. Representatives of twenty-two programs (40%) reported offering graduate-level, stand-alone courses on food-systems planning in the form of seminars, a sharp increase from reports by Hammer (2004). Thirty-three programs (60%) reported that food is included as a topic in other courses. Finally, a small proportion (7.27%) reported offering studio courses, or intensive practicums, on food-systems planning (see Figure 1). The Department of Urban and Regional Planning at UB is one of the few schools in the country that offers stand-alone courses and practicums on food-systems planning, and beginning in 2016-17, the department launched a formal graduate specialization in food-systems planning. At least one other program at Wayne State University integrates research, education, and engagement through its SEED Wayne program, founded and led by a planning faculty member (Pothukuchi, 2012). Several other programs—including the pioneering program at UW-Madison, which was among the earliest to offer coursework in the area—continue to advance food-systems planning education. Despite these promising developments, food-systems planning remains far from mainstream planning education.

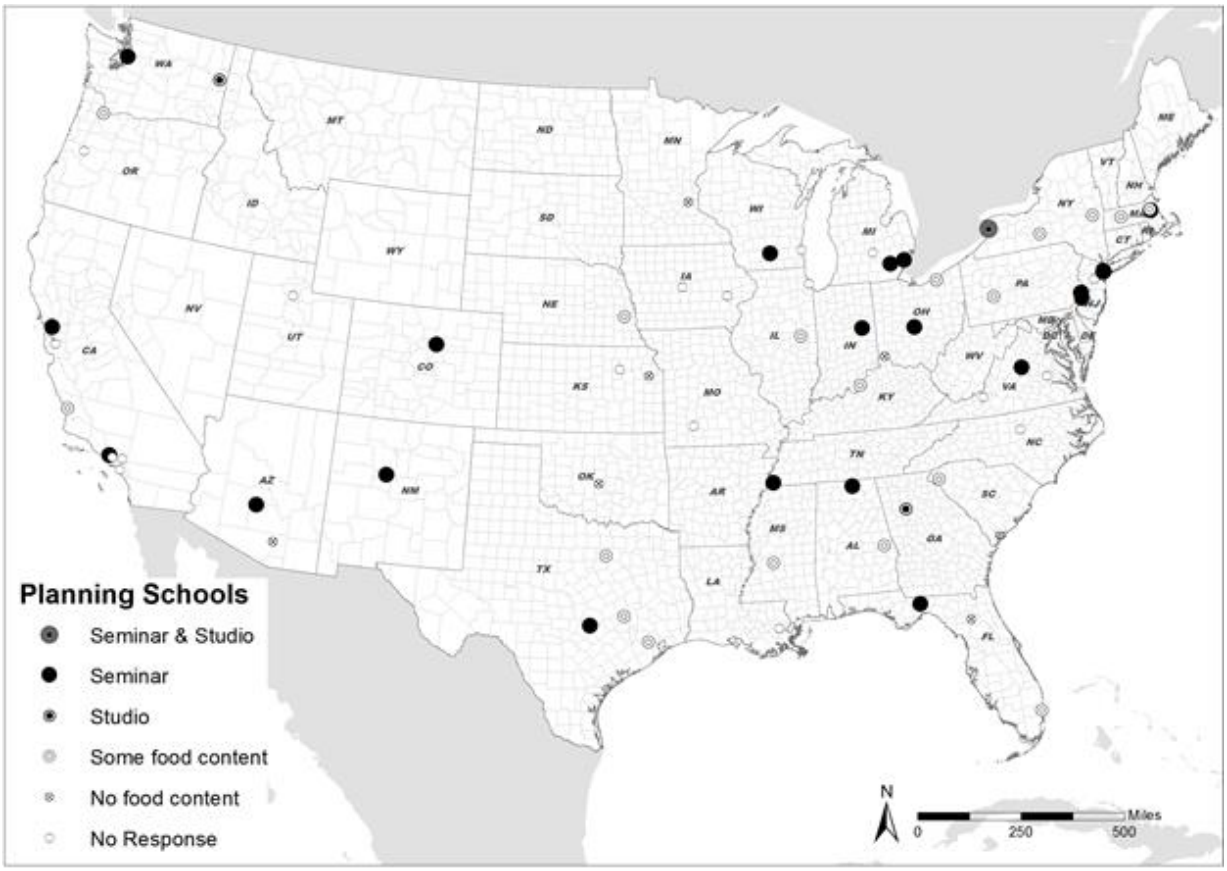

Figure 1. Food-Systems Education Offerings in Accredited Planning Programs.

Universities can play a key role by developing and improving food-systems planning education, especially by offering studios on community food-systems planning/policy change (Mendes & Nasr, 2011). Planning studios, often required in planning programs, are a longstanding pedagogical tradition in the United States and globally. Typically, in a high-credit-bearing course, students work in a team guided by a faculty instructor to prepare plans (or reports) in response to a real-world community problem (Frank, 2006). Students learn the art of planning through the process of preparing a plan for a community client. A studio is more than an opportunity to blend scientific knowledge (episteme) and technical knowhow (techne); it is an opportunity for students, faculty, and community clients to exercise the Aristotelian idea of phronesis (Flyvberg, 2001), or practical judgment, in response to a community problem.

By co-articulating problems and co-producing knowledge and solutions, students, faculty, and community clients create a dynamic community of practice (Wenger, 1998). For students, a studio is an opportunity to hone their skills as planners in a real-world context. For the faculty member, aside from presenting a rich pedagogical model, the studio is an opportunity to form or deepen relationships in the community. When related to the faculty member's own research area, the studio can also seed lasting action-research partnerships, as illustrated in the case examples below. Importantly, studios can result in research-based plans for community clients. Community partners or clients can use the planning reports to guide future programs, as a basis for grant applications to implement projects, and to advocate for policy change.

Case Examples of Community-University Partnerships Focused on Planning and Policy for Food Systems

The cases presented here draw largely on the experiences of the Food Systems Planning and Healthy Communities Lab at the University at Buffalo, whose research focuses on community-led planning and policy to reduce inequities in the food system and to facilitate healthier communities. This interdisciplinary research group, which includes the authors of this article, comprises graduate students, undergraduate students, and researchers working with the principal investigator (PI), a faculty member in the Department of Urban and Regional Planning. Siemiatycki (2012) describes the multiple roles of planning scholars (and their teams), including: (a) scholar as independent outsider; (b) scholar as public planner; (c) scholar as contractor; (d) scholar as community-based planner; and (e) scholar as activist. Blending these roles, the PI and the lab have a decade-long history of action-based research (Greenwood & Levin, 2007) on community food-systems planning and policy within the city and surrounding region of Buffalo, New York, and an emerging history of working nationally and globally. We present two case studies, one of Buffalo, New York, and one of Chautauqua County, New York. The varied geographic locus of activities, within UB's urban backyard and in regional rural areas, presents challenges and opportunities, which we explore.

Growing Food Policy in the City of Buffalo, New York

As a post-industrial Great Lakes city, Buffalo, New York has risen and fallen as a leader in the global food system. During the 19th and early 20th centuries, Buffalo was the number-one grain port in the world, host to mechanized steam-operated grain elevators that moved 300 million bushels of grain each year from the Midwest onto ships that passed through the Erie Canal to markets on the Atlantic seaboard (Raja, Picard, Baek, & Delgado, 2014). The opening of the St. Lawrence Seaway in 1959 rendered the canal obsolete. Combined with a decline in other large industries, the city faced significant, ongoing economic decline through the end of the 20th century. Today, the city's population is 260,000, roughly half its former size. With a poverty rate of nearly 30 percent, persistently high unemployment, and a deteriorating neighborhood environment, the city has struggled to rebound.

Simultaneous to the drastic decline in manufacturing, the city lost a key anchor institution. In 1968, UB, the largest public university in New York State, broke ground for their secondary campus in a suburb of the city, an expansion that moved the majority of the university, including sports arenas, cultural events, research centers, and student housing, outside the city (University at Buffalo The State University of New York). As a result, the university's positive economic impact accrued largely outside the urban core. A 2007 study reports that university operations, living expenses of employees and students, and visitors' economic contributions generate about a billion dollars to the region (University at Buffalo Regional Institute, 2007). While suburban areas of the region thrived, the City of Buffalo did not reap similar benefits. Nearly 40 years later, today UB is reconsidering its role in the city by investing in its two city campuses: a downtown medical campus that will host a new medical school and an urban campus in the north of the city. This urban campus will continue to house multiple professional schools, including the

School of Architecture and Planning, which has a celebrated tradition of working in the City of Buffalo (Biemiller, 2015).

The university has cultivated relationships with community organizations, and these partnerships integrate education, research, and civic engagement activities to strengthen food-systems planning and policy. The UB Food Systems Planning and Healthy Communities Lab collaborates with the Massachusetts Avenue Project (MAP) and Grassroots Gardens of Western New York, two non-profits working to rebuild and strengthen the city's food system. Established in 1992 by a coalition of residents, MAP formally incorporated in 2002. MAP's programs, which are primarily focused on building capacity of city youth, include farm education, youth enterprise development, mobile food markets, and community education and policy outreach. Through this programming, MAP engages and trains about 50 high-school aged youth annually.

Grassroots Gardens Western New York (GGWNY), also established in 1992, enables community-led efforts to enhance quality of life through the creation and maintenance of community gardens. Facilitating a growing, determined network of more than 2,000 community gardening activists tending more than 100 community gardens, GGWNY empowers residents and serves as a channel for strengthening the food system.

Collaboration between the UB Food Lab and these organizations originated in the early 2000s, with conversations between UB faculty and organization staff about their shared passion for rebuilding communities' food systems. The partnerships with these organizations have grown to include mutually reinforcing activities spanning education, research, and community engagement to effect change, including policy change, in Buffalo's food system.

As is common in community-university partnerships focused on food systems (Campbell, 2004), the UB Food Lab's policy work often begins with educational activities to engage university students. The PI of the Food Lab, as part of her university teaching obligation, offers semester-long intensive planning practicums, also called studios or workshops, during which students prepare a food-systems plan or policy report in partnership with a community client such as a not-for-profit organization or a local government agency. One of the first food-focused planning studios offered by UB was in 2003, during which students prepared *Food for Growth*, a neighborhood-scale food-system assessment and plan in partnership with MAP (Almeida et al., 2003). The plan, which received regional and national awards from the American Planning Association, documents opportunities and challenges in the food system on Buffalo's west side. Key strengths of *Food for Growth* are its problem formulation, analyses, and recommendations drawn from the lived experiences of neighborhood residents, experiential knowledge of MAP staff, and academic rigor of the UB team. MAP has since implemented many recommendations from *Food for Growth*, and the research has helped MAP to "focus its programs and resources in effective ways to address food security and advocate for systemic solutions (Almeida et al., 2003)."

Similar courses at UB have increased students' practical experience in food-systems planning while providing student-generated knowledge to inform local municipal planning and policy. UB's *Queen City Garden Plan*, resulting from a 2009 graduate course, complemented *Food for Growth's* emphasis on community engagement by providing a course of action for the City of

Buffalo's Community Gardens Task Force. Incorporating the results of intensive community visioning sessions, the *Queen City Garden Plan* assessed the state of Buffalo's community gardens, evaluated legal and regulatory frameworks, and provided a comprehensive community gardening plan. Most important, the goals and objectives established in the community sessions guided the plan (Barton et al., 2009). The report laid the groundwork for several municipal resolutions in support of community gardening in Buffalo.

In Erie County, which is home to the City of Buffalo and additional municipalities, the county-wide agriculture preservation plan was informed by *Room at the Table* (Conley et al., 2011), a food assessment developed during a 2011 planning practicum on behalf of the Erie County Department of Environment and Planning and the American Farmland Trust. *Room at the Table* provided recommendations to strengthen the food system by rejuvenating the local farming sector while promoting residents' health and fostering economic development. Most recently, *Invest in Fresh*, developed during a 2013 planning practicum, provided guidance on promoting healthy food retail in small urban and rural areas in collaboration with a rural health network in Chautauqua County, a rural county in the western New York region (Attard et al., 2014). Again, the requirement of participatory community visioning sessions and emphasis on residents' lived experiences helped the studios to identify and propose food policies based on local food-systems practices and experiences.

Just as the UB Food Lab provides education for community members and organizations, the lab and the wider university have benefited from hands-on, community-based education that grounds students and faculty in food-systems planning and policy ideas that are otherwise abstract. This outside-the-classroom experience happens through numerous activities: for more than a dozen years, MAP and GGWNY have generously hosted students from graduate classes; staff members participate as seminar speakers in courses and provide feedback on student work. Purposeful interaction with food organizations' staff inspires and motivates students and embraces a key premise of successful community-university partnerships: everyone has knowledge to teach, and everyone has something to learn (Holland & Gelmon, 1998).

Although the educational activities described thus far are essential, they alone cannot sustain food-systems policy/planning change. Adoption, implementation, and evaluation of food-systems policies and plans require a long-term horizon—sometimes more than a decade—whereas educational activities, including intensive studios, tend to last for about a semester. Therefore, educational activities must be supplemented by research and capacity-building partnerships that continually shape, implement, and evaluate local government planning and policy for stronger food systems (Campbell, 2004). In Buffalo, educational activities to support food-systems change are supplemented by participatory action research partnerships (Greenwood & Levin, 2007).

For example, the UB Food Lab and MAP have partnered on an award-winning participatory action-research project that has lasted for more than 12 years (Raja, Picard, et al., 2014). In addition to guiding and evaluating MAP's programming, the results of this participatory action research generate new scholarship on food-systems planning (Raj, Raja, & Dukes, 2016; Raja, Breinlich, & Kallas, 2010; Raja & Diao, 2016; Raja, Picard, et al., 2014; Raja, Raj, & Roberts, Forthcoming; Raja & Whittaker, Forthcoming), form the basis of long-term policy change in the

city and region (Raja, Hall, et al., 2014), and serve as model for planning practice nationally (Neuner, Kelly, & Raja, 2011; Raja et al., 2008) and globally (Raja et al., 2016).

To make research accessible and purposeful for policy makers and planners, the UB Food Lab publishes short policy briefs that summarize findings from traditional research articles (Whittaker & Raja, 2015) and prepares briefs and plans on pressing food-systems issues in Buffalo and the surrounding region. For example, as a member of the Healthy Kids, Healthy Communities-Buffalo (HKHC-Buffalo) coalition, which also includes the local organizations MAP, GGWNY, and public-sector agencies, the UB Food Lab used Buffalo-specific data to develop policy briefs focused on food systems and healthy communities (Delgado, Norton, & Raja, 2013; Neuner, Gooch, & Raja, 2012; Neuner, Hall, & Raja, 2012; Neuner et al., 2011; Neuner & Raja, 2010a, 2010b).

The university led the research, while community partners selected indicators and participated in data collection, development, layout, and dissemination through trainings. Resolutions and laws that support stronger food systems were developed and adopted based on this collective effort. For example, the work of the HKHC partnership led to the creation of the Buffalo and Erie County Food Policy Council, the second food policy council to be legally recognized in New York State. More recently, a larger coalition that included the university developed a regional sustainability plan, *One Region Forward*, which includes a section on food (Raja, Hall, et al., 2014). The first regional food plan for Buffalo and surrounding counties (Raja et al., Forthcoming), *One Region Forward* examines the broader region's responsibility to farmers and rural producers, who are key partners in planning just urban (and rural) food systems.

Urban food-systems policy is most likely to be developed and implemented when it is supported by a diverse, unified, and informed community coalition (Raja, Picard, et al., 2014). Universities are especially well equipped to prepare individuals, via timely training and education, to be policy change agents in their own neighborhoods. In Buffalo, recent examples illustrate this potential. Within the last five years, local and regional government agencies in the Buffalo region launched multiple planning processes, including one to overhaul the city's outdated land-use plan and zoning code, and an effort to develop a regional sustainability plan for a bi-county area; the prior land-use plan, zoning code, and regional plan were largely food blind, with little reference to the community's food system (Raja, Picard, et al., 2014). A coalition of community partners and the university responded to this window of opportunity by training residents, especially youth, to bring food-systems concerns into the planning processes. For example, the UB Food Lab trained city youth working with MAP to design and conduct food assessments to inform planning processes, and these young people conducted extensive neighborhood trainings for residents on zoning and planning. The youths' assessment informs local policies, including the region's first formal plan that includes a focus on food systems (Raja, Hall, et al., 2014).

Collective education and learning can (and should) be extended to a larger community beyond the individuals and organizations *directly* involved in the immediate community-university partnership. The potential for policy action is amplified when both the university and community co-organize and co-facilitate such outreach into a larger community coalition. For example, the Food Lab, MAP, GGWNY, and other organization jointly hosted two Buffalo Food Policy

Summits, which included public lectures, seminars, and workshops held in the community and at the university.

Successful university-community partnerships also lay the groundwork for deeper collaboration among other university and community members (Reardon, 2000). In an effort to widen and deepen partnerships on food-justice issues in Buffalo, in 2016 the Food Lab and MAP co-facilitated a workshop that explored strategies by which university-community partnerships can work more effectively. Attendees included pairs of university faculty and their community partners, who discussed problems in the food system as well as challenges and opportunities for addressing these problems by working together. This form of reciprocity creates more sustainable relationships between communities and universities (Bloomgarden, 2013).

Buffalo's experience in using planning to strengthen the food system is premised on a collaborative partnership among community members and researchers at all points in the planning/policy process. Building on Schon's (1984) idea of "problem setting" before problem solving, researchers develop and articulate questions by actively listening to community concerns (Schon, 1984). Community residents play a role in deciding data-collection methods and are trained to gather data. By taking part in the writing of plans, policy briefs, and journal articles, community residents help to translate and disseminate research to wider audiences more effectively. Importantly, community organizations in Buffalo play a key role in holding accountable those involved in food-systems policy work. For example, a group of community organizations recently organized the People's Food Movement, to judge the degree to which formal assessment and planning processes *actually* reflect residents' aspirations. These collective actions, which are simultaneously formal and informal, civic and political, collaborative and confrontational, ensure that policies, laws, and local government actions intended to strengthen the food system adhere to community visions and are grounded in research.

Growing Food Policy Outside the (Urban) Backyard

In recent years, the UB Food Lab has begun to engage in supporting food-systems planning across the country via a comprehensive project that seeks to integrate food into urban, regional, and rural planning practices. The Growing Food Connections (GFC) project (growingfoodconnections.org), which partners with Cultivating Healthy Places, The Ohio State University, American Farmland Trust, and the American Planning Association, seeks to build the capacity of local governments that aim to use planning tools to reduce food insecurity among low-resource residents, while improving the viability of small- and medium-sized farms. The project emphasizes integrated knowledge development through three key domains: research, education, and practice. Thus, university partners, professional planning practitioners, and community partners concurrently learn and adapt their practices. Although knowledge generation within this project is iterative across the three domains, here we focus in-depth on one portion of the GFC project—our participatory action policy research—that builds the local governments' and community stakeholders' capacity to use planning and policy to simultaneously improve food and farm security.

The GFC research framework rests on the idea that county governments and municipalities are (and can be) prepared to use planning and policy to address their food system through actions

unique to their particular geography and community. Indeed, many local governments already actively engage in innovative food-systems planning work, while many others are, with guidance and support, primed for change. In the GFC project, we identify these two types of communities, those actively engaged in food-systems planning and those primed for change, as Communities of Innovation and Communities of Opportunity, respectively. The GFC model (Raja et al., In Press) hypothesizes these two types of communities may be able to learn from each others' experiences, to strengthen their food systems. By providing a domain for joint discussion both within and across communities and then encouraging direct action through practice, the Communities of Innovation and Communities of Opportunity are developing shared repertoires of resources and solutions. Research, capacity-building, and technical support to the local governments of Communities of Opportunity are partially premised on observations, lessons, and challenges happening in Communities of Innovation.

The sharing of lessons learned in our Buffalo and Erie County-based work to facilitate community and university engagement as well as nationwide community-to-community engagement and education has yielded rich knowledge of how universities can partner with communities in distant regions. The cyclical process of learning and sharing, seeking partnerships, building relationships, and increasing capacity has generated the lessons described below.

Currently, the GFC project draws on research on more than a dozen Communities of Innovation (Raja et al., In Press), which were selected, from about 300 communities nationally, for their local governments having played significant planning or policy roles in strengthening small- and medium-sized agriculture and improving food access for low-resource consumers. This knowledge development is transferred, through the participatory research actions described below, to eight new counties identified as Communities of Opportunity. In these counties, a thriving agricultural sector exists alongside high food insecurity (Raja et al., In Press). Communities of Opportunity were selected through rigorous quantitative and qualitative methods to identify the complex notion of a community's opportunity for public policy change. By ranking all 3,141 counties in the United States, based on an aggregated index measuring high potential for food production and high food insecurity, the GFC team selected a subset of counties where increased capacity for policy suggested the most potential for long-term change. In addition to a county's ranking in the index, the selection process included a significant qualitative assessment to understand communities' readiness for engaging in collective action.

Eight counties across the United States were invited to participate as Communities of Opportunity. These are Dougherty, GA; Cumberland, ME; Douglas, NE; Chautauqua, NY; Polk, NC; Wyandotte, KS; and Dona Ana and Luna, both in NM. The eight selected communities represent different census regions of the country and vary along the urban-rural continuum. Because summaries of the in-depth work happening in each community are beyond the scope of this article, we focus on Chautauqua County, NY, a rural county where our depth and duration of experience (about four years) are more limited than in Buffalo. Chautauqua County was selected as a potential Community of Opportunity for its high ranking on the index of agricultural productivity and high food insecurity, in addition to its strong propensity for policy movement and action. The partnership with GFC was finalized when Chautauqua's political leaders committed to addressing food insecurity and farm viability through planning and policy. The

county's close proximity (approximately an hour southwest of Buffalo) allows further opportunities to develop deeper organic relationships. The UB Food Lab and partners are learning new lessons as we extend our work into a rural, agriculture-based community that displays different challenges and opportunities than those in the City of Buffalo.

Chautauqua County has a vibrant agricultural base enhanced by its location along the shore of Lake Erie, which affords a relatively warm microclimate ideal for fruit production. The county, which includes two small cities and numerous small towns, is home to 1,515 farms, the second highest number in the state of New York. The majority of the county's farms are small- and mid-sized and face viability challenges resulting from a changing agricultural industry, an increase in principal farm operators, labor shortages, and lack of regional infrastructure to support small-scale diversified production. Food insecurity is high among seniors, minority populations, and low-income families, but strong social stigma toward social safety-net programs has resulted in underutilization of SNAP, TANF, and similarly designed programs. Chautauqua County's government supports the efforts of healthcare organizations, civic organizations, and private enterprises to support and protect their valuable agricultural assets and to provide opportunities to increase food security (Whittaker & Raja, 2016).

The GFC project is not the first time that UB has worked on food policy in Chautauqua County. Modeled on the UB Food Lab's relationship with the Buffalo-based Massachusetts Avenue Project, an educational component (the planning practicum) served as an initial university investment that laid the groundwork for the UB Food Lab and Chautauqua County organizations to come together. *Invest in Fresh*, studio work on establishing healthy food retail in Jamestown (completed in 2013 for the Chautauqua County Health Network), provided baseline data-collection and relationship-building opportunities. When Chautauqua County representatives nominated their county to be a GFC Community of Opportunity, the pre-established connection (in addition to their ranking on the index) allowed planning work to proceed at a quicker pace than in other Communities of Opportunity.

The GFC team prepares local governments in Communities of Opportunity to engage in food-system policy efforts through capacity-building activities that vary based on pre-existing local government capacity. For example, at the beginning of the project, the team conducted day-long intensive workshops for community representatives at the American Planning Association National Conference. These workshops exposed Community of Opportunity representatives to food-systems planning practices unfolding in other places and provided opportunities for professional development and networking. In addition to providing opportunities for capacity-building outside the community, two-day visioning workshops in each community laid the groundwork for the creation of steering committees. Recognizing diverse values and experiences, GFC organized workshops in each location based on principles of equitable civic engagement. These workshops prepared steering-committee members and local government officials to consider how their policy work affects diverse populations. Frequent webinars conducted by food-systems planning practitioners provide learning opportunities across Communities of Innovation and Communities of Opportunity. Such capacity-building opportunities are especially meaningful for governments and organizations with scant resources for food planning.

Working across multiple communities with varying geographies, resources, and histories presents challenges in integrating teaching, research, and engagement. The different timelines of communities, universities, and funders intensify these challenges. Drawing on our experiences, we share a few lessons.

Challenges and Lessons for Urban Universities' Engagement in Food-Systems Planning and Policy

Shape the End From the Beginning

Effective engagement in food-systems planning requires relationships that can endure for the time required for the ideation, development, and implementation of food policies and plans. How relationships in the planning process are seeded is crucial to their success and sustainability. As noted, the relationship between the UB Food Lab and community organizations began with conversations among faculty and staff about shared interests in food and community development, and was strengthened through the launch of the first formal food-planning studio. In both Buffalo and Chautauqua County, the studio set the stage for rich, long-term relationships, forming an ongoing community of practice (Wenger, 1998). When communities have limited or no opportunity to partner on a studio, the lab and its partners seek to work when there is an explicit invitation from the community. Without being embedded in or invited by a community, universities have limited ability to support food policy/planning over time. Yet, being outside a community may also allow a university partner to perceive challenges or shortcomings that would be otherwise hidden to an insider.

Build Capacity for Planning Process Before Preparing a Plan

Cultivating community-university partnerships for food-systems policy change is a time-intensive process that requires a deep, long-term investment to foster trust (Raja, Picard, et al., 2014), particularly if universities' and communities' interests do not always align. Overcoming this misalignment requires robust groundwork, sustained effort, and a focus on mutual benefits (Clark et al., 2015). Universities can help to translate community desire for specific outcomes (e.g., community food security) into a policy agenda. Furthermore, providing the right tools to empower a community to *lead* a policy and planning process themselves rather than having universities lead processes or agendas for a community, requires the development of skills, capacity, and understanding. Such an undertaking cannot be rushed. To this end, helping communities learn to lead or engage in a planning process, rather than to prepare a plan, may be more crucial in the long run.

Recognize Benefits and Burdens for Communities

For community organizations, working with university partners on food-systems policy is an opportunity to amplify their work. Such partnerships also afford professional development, especially for organizations and individuals from smaller communities. Nonetheless, engaging with universities can be burdensome, and community partners have been exploited in such partnerships (Niewolny et al., 2012). Furthermore, as noted above, community organizations typically do not have a funded mandate to engage in long-term food-policy work. To make the

most of such a partnership and achieve transformational change, community partners' short-term and long-term missions (e.g., fighting food insecurity) must align with the university partners' policy/planning goals (e.g., policy change for food insecurity) (Kecskes & Foster, 2013). Additionally, community organizations are a source of local knowledge (Scott, 1998) yet are rarely recognized for their expertise (Niewolny, et al., 2012). To address this problem, the UB Food Lab invites community partners to be co-authors of published works, whenever possible.

Recognize Benefits and Burdens for Universities

Engaging in planning/policy efforts to shore up food systems is unquestionably rewarding for faculty and students. Universities benefit by having a positive societal impact on the knottiest of problems. Students are inspired by working on issues that matter in communities. Engaging in these planning/policy efforts, however, places a burden on university constituents, especially early-career faculty. Early-career, tenure-track faculty are penalized because engaging in food-systems planning requires significant time (Mendes et al., 2011). Furthermore, as many early-career faculty members have discovered, civic engagement in food-planning processes or development of food-systems plans, with no attendant or subsequent journal publications, is typically not recognized as peer-reviewed scholarship during tenure review. Urban university leaders can help to overcome institutional barriers (Whitmer et al., 2010) by reformulating tenure guidelines that consider the development, passage, and implementation of food-systems policies and plans *as* civic scholarship. To be sure, these policies must be vetted through peer review in much the same way as traditional scholarship, but failure to recognize the development of food-systems plan/policies as a valued outcome for early-career faculty will continue to undermine the translation of knowledge for societal good.

Moreover, it is challenging for university faculty to engage in food-systems scholarship and civic engagement because these activities often transcend academic units. Fortunately, the leadership at UB offers significant support, at multiple levels, to support food-systems scholarship, education, and engagement. For instance, in 2015, the university made a multimillion dollar investment to create transdisciplinary university-wide centers, one of which, the Community of Global Health Equity, explicitly supports a focus on food equity globally (University at Buffalo The State University of New York, 2015). Without flexible funding and vision and commitment from university leadership, long-term faculty engagement in food-systems policy and planning is difficult if not impossible.

Reimagine Responsibility in Terms of a Larger Region

Food systems are rarely contained within an urban or rural area. Urban areas provide markets for rural communities, and rural communities are often sources of food and natural amenities for urban areas. In western New York, for example, stronger food-systems linkages between the City of Buffalo and Chautauqua County could serve to strengthen the region as a whole. The false conceptual divide between urban and rural areas hinders the development of policy ideas that support an integrated regional foodscape. Therefore, food-systems planning efforts require linking with and investing in regions across the rural and urban continuum. Thus far, however, the predominant discourse in food-systems planning and policy draws attention to planning

innovations in resource-rich urban areas such as Seattle, Portland, and Madison, while overlooking possibilities in rural areas and in small cities (Bedore, 2012).

As anchor institutions, urban universities also reach well beyond the confines of the city boundaries in which they are located. It is well documented, for example, that universities are key actors in their regional economies (Drucker & Goldstein, 2007). Universities shape the rules and trajectories of regional economic and social outcomes (Gertler, 2010). From a practical standpoint, universities are also key actors in the food system. These institutions purchase food; generate food waste; employ food-system workers; feed students, faculty, and staff; and if they are land-grant universities, they likely have farms in the region. Using the region as a frame for action (Kloppenburg, Hendrickson, & Stevenson, 1996), urban universities have the ability and, indeed, the responsibility to transcend boundaries. Working across communities, universities can help regional partners to envision just, equitable community food systems, and support regional transformations.

Conclusion

Planning and policy to strengthen community food systems is a fairly new idea for U.S. communities and their local governments. Many communities, including post-industrial cities and rural areas, often do not have the resources to engage in planning efforts for food systems. These same communities are also home to food-justice organizations that continually wage an uphill battle in the midst of food-blind planning and policy. Urban universities can play a key role in helping to build just food systems, by amplifying efforts to support food-systems plans and policies that strengthen—not undermine—community practices.

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Farming Chicago: Prospects for Higher Education Support of Sustainable Urban Food Systems in the U.S. Heartland

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Abstract

The article highlights recent food policies in Chicago with the goal of exploring how higher education institutions can contribute to development of sustainable food resources for residents of North American cities. Thousands of Chicago residents face daily challenges accessing fresh food due to income constraints and/or lack of proximity to food retailers. Concomitantly, the city's high dependency on imported food, often from thousands of miles away, is countered by growing interest in local production in community gardens and urban farms. The article outlines efforts at redeveloping Chicago into a thriving producer of fresh food through advocacy, policy making, and planning; and curriculum and community engagement efforts at Chicago area universities and colleges that exemplifies higher education's role in creating a just and ecologically sustainable urban food system. The examples illustrate the importance of multi-institutional collaboration, often driven by community-based advocacy groups that facilitate local food research, technical assistance, and policy initiatives with support from universities and colleges. The article therefore highlights the supportive role urban higher education institutions can play in building food systems that support the local food economy, contribute to improving the natural environment, and expand access to nutritious fresh food for those with the least wherewithal.

Keywords
Chicago, Higher education, Food systems, Community-university partnerships, Sustainability

Introduction

The article describes (1) recent efforts at redeveloping Chicago into a thriving producer of fresh food, through advocacy, policy making, and planning; and (2) prospects for advancing higher education's role in creating a socially equitable, economically just, and ecologically sustainable food system in Chicago. We suggest that higher education institutions can play a supportive role in promoting urban food production and distribution initiatives driven by local residents. We begin by exploring the history of community-driven efforts to produce locally-focused food policies in Chicago and conclude by suggesting ways in which higher education institutions have supported and can further support sustainable urban food-systems development. The primary goal of the article is to highlight ways in which urban higher education institutions can support greater access to fresh, nutritious food for local residents, using the case of Chicago.

Chicago is a robust commercial center and diverse international city on the western shores of Lake Michigan in the agriculturally rich Midwest region of the United States. Through advocacy,

determined urban food producers have made farming and gardening in and around Chicago an emerging alternative to provisioning the city with food that is otherwise imported from outside the state, region, or country. The article highlights the history of recent food policies in the city with the goal of exploring how higher education institutions can support development of a sustainable urban food system. Research in higher education on the latter is of growing interest within the social and environmental sciences, but has implications for the future development of higher education curriculum and community engagement practice. As transdisciplinary stakeholders, researchers in sustainable urban food systems help inform municipal, state, and federal policy makers in ways, through producing data on ways to increase food equity. That in turn can potentially have liberatory outcomes for those historically marginalized by the spatial and economic relations of food access in cities. As in the case of many land-grant universities with extension services, urban universities are becoming centers for technical assistance and capacity building through teaching, research, and student/faculty community service focused on food systems. If deployed through a critical lens respectful of the history, voices, and concerns of communities, higher education resources can be of tremendous benefit to urban food producers and distributors, and especially those seeking solutions to urban food access challenges. Until recently, food producers in Chicago, a city largely perceived as commercial, industrial and residential, have had minimal support from neighboring universities and colleges. Higher education curriculum and research, technical assistance, and capacity-building for growers has been virtually nonexistent. As little as a decade ago, curriculum focused on farming in the city—once an urban space teeming with agriculture—would have been inconceivable as a subject of study within most Chicago-area universities.

Presently, the majority of Chicago's food resources remain under control of large corporate retailers and wholesalers. Undoubtedly, community gardens and farms in the city serve as a relatively minor resource in regards to the quantity and types of food needed to feed the city. Although Chicago community gardens and urban farms typically evolved as an alternative to supermarkets, city-grown food through for-profit urban farming is quickly enmeshing itself into farmers markets and retail food stores. Community gardens are also expanding rapidly, creating neighborhood commons for both community-building and procuring fresh food, despite little to no support from higher education and minimal assistance from the municipal government. Along with capital-intensive urban agriculture projects linked to both for-profit and philanthropic initiatives, rapidly expanding commercial and community-based food production has become an important force in the process of transforming post-industrial urban landscapes. In the second section, we explore the history of the policies that underlie these processes in Chicago.

Food System Policy and Planning in Chicago

Farming Chicago

Farming in what is present-day Chicago dates back to well before Europeans arrived in the western Great Lakes region. For centuries, indigenous groups including the Miami and Potawatomi peoples cultivated and/or processed corn, squash, beans, nuts, and a variety of protein-rich seeds to compliment diverse fauna of what became northeastern Illinois and present-day Chicago (Markman, 1991). Chicago was chartered as a city in 1837, following the removal of the indigenous population after the Treaty of Chicago in 1833 (Block & Rosing, 2015, pp. 40-

41). During the 19th century, with the help of the railroad, the city became a major center of grain aggregation and trade and by the end of the century, the nation's center for meatpacking. From its outset, the city was also producing food for local consumption and for much of Chicago's first century, farms existed both within and in close proximity to the city. Year-round greenhouses once produced ornamental plants and vegetables for Chicagoans. Farms within and surrounding the city harvested vegetables and produced dairy products for local consumption as well as for export. By the early 20th century, Chicago had become a major hub of the national food economy, a center of food aggregation, debulking, and distribution and eventually of food manufacturing, marketing and commodity trading. As the population grew, farming in the city diminished and urbanization and industrialization transformed Chicago's landscape. Farms were pushed farther out of the city until very little remained of the local food system that once fueled markets and fed Chicagoans (Block & Rosing, 2015, pp. 10-20).

For much of the 20th century, with the exception of a resurgence of "victory gardens" during the two World Wars, agriculture was not recognized as part of city planning or neighborhood development efforts in Chicago. While community garden spaces were included in public park planning, such as the largely unimplemented gardens integrated into parks designed by Danish architect and park superintendent Jens Jensen in the early 20th century, these were small in scale and not focused on feeding the city. Chicago's evolving zoning code neglected to reference community gardens or urban farms as legal land use. The city's last remaining farm was converted to the Chicago High School for Agricultural Sciences during the 1980s. A 2009 report commissioned by the State of Illinois noted that "One thousand five hundred miles is the average travel distance for food items now consumed in this State; agricultural products sold directly for human consumption comprise less than 0.2% of Illinois farm sales." (Illinois Local and Organic Food and Farm Task Force, 2009, p. 41). The report found that 95 percent of organic food sold in the state was grown and processed outside the state and more than 70 percent of the state's agricultural receipts were for corn and soy. Like many North American cities, the provisioning of Chicago has become almost completely dependent upon food imported from distant states and countries, even though more than three quarters of Illinois was covered by farmland.

For much of Chicago's history, farming and gardening either occurred on private property or in public parks either formally or informally. Land access to grow food, especially for those who lived in the ubiquitous multi-unit rental apartment buildings, was at times difficult. During the early part of the 20th century, Chicago corporations sponsored growing plots for their workers. Settlement houses, a precursor to today's nonprofit human service agency, established gardens for residents of the city's tenement housing district. The most well-known of these gardens was at the Hull House. There in 1909, 150 individual plots were allotted to residents by the newly established City Gardens Association, resulting in establishment of the largest urban farm in the U.S. at the time (Maloney, 2008, p. 76). International Harvester Company, one of the largest manufacturers of agricultural machinery, loaned land to the Association and plots were leased to individuals and families to grow food for their own consumption and to sell.

Chicago's motto, *Urbs in Horto* (City in a Garden) continues to reflect practices across social classes whereby city gardeners and farmers share the belief in producing food organically. However, a good portion of the city's current residents face barriers to accessing growing space among other resources needed to produce food, even though as noted above there appears to be

significant interest in community gardening. Chicago's community gardens were historically built on privately- and publicly-owned vacant lots that were never zoned for agriculture or food production. One of the city's first efforts to raise public support of community gardens occurred during the 1970s, when Chicago's Department of Human Services hosted national conferences on community gardening. The result was the creation of the American Community Gardening Association (2016). Two decades later, in 1996, the municipal government, along with other public agencies, created NeighborSpace, a nonprofit urban land trust charged with protecting community-organized and managed growing spaces. The organization took over land ownership and assisted with insurance, access to water, and other resources. Gardens on land protected by NeighborSpace were no longer susceptible to removal as a result of more powerful capital-intensive development interests.

Despite the recent resurgence of interest in urban farming, there is limited empirical data on this phenomenon in cities like Chicago, especially on how the idea of consuming "local food" resonates among economically and racially diverse groups (DeLind, 2011). Recent research on production of food in Chicago, however, suggests widespread interest in communal growing across race and class (Rosing, Helphand, Vitiello, & Odoms-Young, 2016). Notwithstanding the above-mentioned efforts by city government to support local gardeners' land rights, as in other U.S. cities, much of urban food system planning and development in Chicago has occurred at the level of grassroots and nonprofit advocacy groups and educational and human service organizations through support from foundations. Openlands, a non-profit organization started during the early 1960s as an advocate for open space in northeastern Illinois, has been a long-time supporter of protecting vacant land for urban gardens. During the 1990s, the organization began holding workshops for gardeners in partnership with Chicago's Garfield Park Conservatory and later began a school garden building program. In 1995, Green Net, a network of gardeners and urban agriculture advocates, ran a foundation-funded grant program to support gardeners and created a map of Chicago community gardens. In 1999, Chicago hosted the annual meeting of the now-defunct Community Food Security Coalition, a national network of community gardeners and food security activists. Local activists used the conference to show off food justice projects, such as the God's Gang aquaponics center, that was located in the now-demolished Robert Taylor Homes, at the time the largest public housing project in the United States. Such efforts provided the basis for community, school, and backyard garden expansion in Chicago at a time when there was no land use zoning designation for community gardens or urban farms.

Local Food Policy Advocacy

Advocacy for food-systems planning and development in Chicago and the State of Illinois built during the first decade of the 21st century. A Chicago-based foundation, Chicago Community Trust, funded Illinois Food Security Summits from 2001 until 2003 that further energized local and organic food advocates. These efforts built on Chicago's history of local food-systems development by groups such as the Resource Center (City Farm), God's Gang, Openlands, the Chicago Botanic Gardens, and more recent groups such as the Institute for Community Resource Development, Good Greens, Urban Habitat Chicago, Growing Home, Angelic Organics Learning Center, and the Chicago branch of Growing Power, an internationally recognized urban farming organization in nearby Milwaukee, Wisconsin. Building off of grassroots community

organizing for social and environmental justice, these groups pushed for a coordinated urban food policy agenda. Inspired by the first summit at which the creation of a food policy council was voted as the top priority, seasoned urban gardeners, farmers, and food justice activists organized two advocacy organizations in 2002: Chicago Food Policy Action Council (CFPAC; formerly the Chicago Food Policy Advisory Council) and Advocates for Urban Agriculture (AUA). These groups were eventually joined by Chicago-based, but nationally- or regionally-focused sustainable food advocates such as Family Farmed. In 2004, CFPAC published the report "Community Food Security Inventory of the City of Chicago" and by 2006 had organized an annual Chicago Food Policy Summit held as part of Family Farmed's multi-day Good Food Festival, a Chicago-based trade show for local and regional producers and distributors of organic food. That same year, a food desert map of Chicago was published, highlighting vast areas of Chicago that were both low-income and lacked supermarkets (Gallagher, 2006). Drawing on the work of geographers and activists in the United Kingdom (Whelan, Wrigley, Warm, and Cannings, 2002), in 2006 Mari Gallagher released a food access map of Chicago, using data collected for the Northeastern Illinois Food Security Assessment at Chicago State (Block, et al, 2008). Combined with the Northeastern Illinois Food Security Assessment, the map resulted in an increased focus on food access in Chicago and nationwide. City, state, and national political figures, including Michelle Obama, began to focus on Chicago as a place to think through building a more equitable food system.

Before the end of the decade, Chicago-area food-systems advocates began to participate at the state level on behalf of policies to support local and regional food-systems development. The Illinois Local and Organic Food and Farm Task Force was created by the Illinois General Assembly in 2007, and the organization published a report with policy recommendations in 2009. Later that year, advocates celebrated when the Illinois General Assembly (2009) passed the Illinois Local Food, Farms, and Jobs Act (ILFFJA). The act stated "20% of all food and food products purchased by state agencies and state-owned facilities, including, without limitation, facilities for persons with mental health and developmental disabilities, correctional facilities, and public universities, shall, by 2020, be local farm or food products." The legislation created a council under the governor to oversee recommendations for policy implementation. This change in policy could, in theory, lead to food procured locally by numerous Illinois state-funded entities in the populous northeastern region anchored by Chicago and inhabited by more than eight million people. In October 2009, Chicago food advocates published a *Food Systems Report* funded by the Chicago Community Trust (Chicago Food Policy Advisory Council and City of Chicago Department of Zoning and Planning, 2009, p. 7) as part a larger metropolitan urban planning effort. The first recommendation was to "include food and food waste issues in local land use, infrastructure, and comprehensive plans."

According to a 2013 report on the ILFFJA, the state-level procurement policy was difficult to implement (Illinois Local Food Farms Jobs Council, 2013). Though the policy provided the possibility of a public incentive to spur localization of food in Illinois, the results were far from forthcoming. Shortly after passing the ILFFJA, in 2010, the Chicago Metropolitan Agency for Planning (CMAP), the state's regional planning organization for northeastern Illinois, published its comprehensive regional plan GO TO 2040 informed by the *Food Systems Report*. Also commissioned by the Chicago Community Trust, Chapter four of GO TO 2040 titled "Promote Sustainable Local Food" presented three recommendations: (1) Facilitate Sustainable Local Food

Production; (2) Increase Access to Safe, Fresh, Affordable, and Healthy Foods; and (3) Increase Data, Research, Training, and Information Sharing. Each of the recommendations had a set of "implementation action areas" and the first action step under Implementation Action Area #1 was "Support urban agriculture as a source of local food" (CMAP, 2010, pp. 47-50). The challenge, however, was that most municipalities, including Chicago, had little to no policy structure in support of urban agriculture. Chicago lacked zoning codes to legalize land use for the food production that already existed within city limits. To this end, organizers from groups such as CFPAC and AUA developed relationships within the municipal government led by long-time mayor Richard M. Daley. Daley, who called for Chicago to be the "greenest city" in the country, created the Department of Environment and had the city's first green roof installed on city hall in 2001 (the first in the country on a municipal building). During the 1990s, his administration created permitting processes to expand farmers markets and, in addition to supporting the formation of NeighborSpace, developed Greencorps, a jobs program that partly provided technical assistance to community gardens.

In light of CMAP's plan, the Daley Mayoral Administration and its largely acquiescent city council seemed open to local food policy initiatives; Chicago gardeners and farmers were set on legalizing land use for urban agriculture. Such a policy was especially relevant in neighborhoods that lacked proximity to fresh food. The city's post-industrial economy, combined with decades of racist urban planning practices supported by discriminatory mortgage lending and real estate development resulted in neighborhood divestment and property and land devaluation on the south and west sides of the city. The result was a lack of fresh food retailers and an abundance of vacant lots in economically distressed neighborhoods on the south and west sides of the city populated largely by black residents (Gallagher, 2006). Gardens and farms were partly a community response to limited access to fresh food. Urban agriculture initiatives among black residents of Chicago's south and west sides take on what McClintock (2008, pp. 6-7) in the case of Oakland, California refers to as an "emancipatory role," a form of resistance that integrates "ecological stewardship with social justice." In Chicago, groups such as Growing Power call for anti-racist practice to be included in Chicago's food-systems planning (Block, Chávez, Allen & Ramirez, 2012). Furthermore, that planning must be linked to addressing access to fresh food in underserved predominantly black neighborhoods. The first step in the view of gardeners and farmers was to form an urban agriculture land use policy that took into consideration those neighborhoods with the least fresh food resources.

By 2010, the mayor and city council appeared open to an urban agriculture ordinance. As far back as 2007, Daley's Department of Planning and Development published a formal report on the city's food system. *Eat Local, Live Healthy* put forth five recommendations, the first two of which supported local and urban food systems development (City of Chicago Department of Planning and Development, 2007). Increasingly envisioning himself as a "green mayor," Daley authorized in December 2010 the posting of a press release on the city website announcing a proposed zoning amendment that would "incorporate plant-based agricultural definitions and land use tables into Chicago's Zoning Code" (City of Chicago, 2010). Though the proposed policy would recognize urban agriculture as a legal land use, immediate opposition emerged from urban agriculture leaders. Erika Allen, director of Growing Power Chicago, conveyed to the local press that "if this passes, our work would be over," referring to plot size limitations that would make the organization's farms out of compliance (Eng, 2011). Others complained that the

ordinance was designed with limited community input and that requirements for landscaping and fencing would be cost-prohibitive for many if not most Chicago gardeners. Some of the most confusing requirements included tree planting adjacent to gardens that disregarded the need for sunlight to grow food, as well as a requirement that fencing be "architectural." Local growers spent the winter and spring of 2011 organizing against the ordinance that had to be approved by the city council. After the city postponed review of the policy initiative multiple times, the proposed ordinance was deferred to late May 2011 after Daley left office and the new mayor, Rahm Emanuel, was installed.

Following Daley's departure after 22 years in office, organizers saw an opportunity to work with Emanuel who had been Barack Obama's Chief of Staff in Washington D.C. and who proposed to support local food as part of his election campaign. CFPAC and AUA went back to work on proposing revisions to the city for the proposed zoning ordinance. By July 2011, details of a revised ordinance had been finalized and Emanuel announced his proposal at Growing Power's Chicago branch. The ordinance passed the city council and became law in September 2011, marking the first time Chicago municipal policy authorized urban agriculture as a land use. The key to this new zoning ordinance were the grassroots community organizers who met and debated the details of what was needed to establish protocols for food producers from diverse communities with a myriad of interests. That organizing process by no means unified food producing and advocacy groups, whose members spanned race and class diversity of the city. Indeed, there were serious concerns about racial equity in access to resources (capital, land, water, and soil) and about new, predominantly white, food producers entering economically distressed neighborhoods of color and asserting privilege. Nevertheless, the city's new urban agriculture ordinance established a policy foundation for which citywide food activists from all backgrounds could continue to organize, debate, and advocate for future food-systems policies.

Just months after the urban agriculture ordinance was passed in 2011, funding from the Center for Disease Control and Prevention's Communities Putting Prevention to Work initiative supported the Chicago Department of Public Health (CDPH) and the nonprofit Consortium to Lower Obesity in Chicago Children (CLOCC) to develop a Chicago food plan. In December 2011, a couple dozen people huddled into a room in downtown Chicago to talk with CDPH and CLOCC staff about planning the future of the city's food system. The meeting was one of several to be held as part of the CDC-funded Healthy Places initiative that would involve residents in food planning at open meetings held downtown in outlying neighborhoods. The planning process continued through much of 2012 and a resulting report, *A Recipe for Health Places*, was published in January 2013 and outlined five-goals: (a) build healthier neighborhoods; (b) grow food;, (c) expand healthy food enterprises; (d) strengthen the food safety net; and (e) serve healthy food and beverages. "Grow Food" contained five objectives including creating more "public open spaces for large-scale food growing, job training, and food related education," enhancing community and school gardens, ensuring the land is "safe for growing food," encouraging the "use of private spaces to grow health food, and collecting data on urban food production" (City of Chicago Department of Housing and Economic Development, 2013). In defining these objectives, the plan reiterated what advocates had been calling for, for more than a decade.

Growing More Food in Chicago

In general, growing more food in cities requires additional land that is zoned or designated as agricultural land which sets up the predicament of whether municipal governments want to prioritize land for food over other development initiatives that produce higher tax revenues. Chicago, which had more than a $63 billion debt in 2014, is a major landowner and major player in land deals. While urban agriculture has been cited as a way to improve nutrition and community food security in U.S. cities (e.g., Ableman 2000), little systematic research exists on whether municipal governments value community gardens and urban farms as part of community and economic development, though scholars have clearly illustrated the benefits of urban agriculture to cities (Lovell, 2010).

As McClintock states in the case of Oakland, the local food movement in black communities is partly driven by a long lineage of resistance that could reshape local agri-food and land use policies. This is a resistance that dates from forced migration, slavery, Jim Crow, ghettoization, and racialized neighborhood divestment in Chicago; these are underlying factors that remain at the core of efforts to develop a truly sustainable food system built on just social and economic principles and sound environmental practices. Several black farmers and black-led, community-based organizations led the charge to produce food locally, including Growing Power, Center for Urban Transformation, God's Gang, SEED, Grow Greater Englewood, Black Oaks, the Roseland-Pullman Urban Agriculture Network and Good Greens (now hosted by the USDA Midwest regional office in Chicago). Many of these organizations have worked in recent years to level the playing field for black gardeners and farmers to successfully participate in and take some control over the local food economy. In one recent study conducted in a predominantly black south side neighborhood, more than 80% of participants stated they would grow food if they had the resources to do so (Rosing, Hollowell, Engler, Spittle, 2014). Given that many historically segregated black neighborhoods in Chicago correlate with high rates of vacant lots, questions about land access for urban agriculture often focuses on these neighborhoods. Building on a 2005 neighborhood plan developed by the community in partnership with the Local Initiatives Support Corporation Chicago (LISC, 2005), in March 2014, city planners adopted the Green Healthy Neighborhoods (GHN) plan which largely focused on the predominantly black south side Englewood neighborhood. Citing goal two of *A Recipe for Health Places*, the plan called for "development of clusters of vacant land for urban agriculture" and two urban agriculture "districts." That July, Mayor Emanuel held a groundbreaking ceremony in Englewood for supermarket chain Whole Foods Market that opened a store in 2016 which has committed to buying from local suppliers in a neighborhood where median household income is under $20,000 (City of Chicago, 2014). The recently launched Englewood community group Grow Greater Englewood (GGE) proceeded to organize, to ensure new plans and investments benefit the existing community. Through support from the Chicago Community Trust, GGE developed their own plan in partnership with NeighborSpace. The Englewood Community Farms Prospectus and Business Plan, published in December 2015, calls for "community-controlled farms in an urban agriculture district" where land would be provided for for-profit and cooperative farming operations (Teska Associates, 2015, p. 1).

Once land access and tenure issues are addressed, the costliest resource for starting a garden or farm in Chicago is the soil that is often needed to replace or grow on top of contaminated soil. Chicago soils are challenging due to structural and toxicity issues, making remediation

expensive. Transforming food scraps into soil through composting is a practice that, until recently, was impeded by city law that for forbade growers from bringing off-site food scraps into growing spaces without a specialized permit. Given the apparent toxicity of much of Chicago's soils, it is not surprising that composting policy emerged as a priority issue for local food-systems advocates. In 2014, food policy organizers turned their attention to formulating and passing a new city ordinance on the production of compost in Chicago gardens and farms. That year, a state-level advocacy group, Illinois Stewardship Alliance, spearheaded the passing of a state law permitting off-site food scraps to be brought onto farms and gardens. By 2015, the Mayor's office in Chicago agreed to support a similar ordinance and the state-level Illinois Environmental Council began working with CFPAC, AUA, and numerous long-term advocates of gardening, composting, and habitat development to formulate a policy proposal. In July 2015, the city council passed an ordinance to expand composting in gardens and farms, with support from a wide range of grassroots environmental and food-systems advocates (City of Chicago, 2015)

As advocacy groups continued to push Chicago toward adopting food policies focused on local production, profit and nonprofit urban agriculture organizations opened or expanded alongside more informal producers and distributors such as community gardens. These include organizations such as The Plant, a vertical farm located in a 95,000-square-foot former meat packing plant in Chicago's former stockyards that contains aquaponics, a commercial kitchen, and a brewery. The organization seeks to build a closed loop system where waste from the food businesses go toward powering The Plant via an anaerobic digester. Other large-scale indoor and outdoor urban farming operations are rapidly developing in the city, such as Farmed Here or Gotham Greens that in 2015 opened a 75,000-square-foot rooftop farm in the South Side Pullman neighborhood on the roof of a soap factory. Such profit or non-profit businesses, opening largely in former industrial areas or adjacent to economically distressed neighborhoods of color, present questions about the direction of policies to promote sustainable urban food systems and whether the emerging Chicago food system incorporates participation in production and distribution by local residents.

Arguably, the above questions drive to the heart of what is meant by sustainable urban food system. It is a question that challenges local educators and researchers to move toward building procurement practices, curriculum, and forms of community engagement that promote local, neighborhood involvement and investment in building growth opportunities and equity within Chicago's food system. As we will explore in the subsequent section, there is some hope in this regard as higher education institutions begin to understand their multifaceted role in the local food system. At the level of institutional food procurement, municipality-funded or governed primary and secondary schools and community colleges in Chicago will likely find themselves intersecting with a recent municipal policy initiative known as the "Good Food Purchasing Policy" (goodfoodpurchasing.org). Similar to the state-level ILFFJA and a policy passed by the City of Los Angeles, the initiative seeks to require public institutions such as schools and park districts to procure food from local producers whenever possible. Similar policies were recently adopted by San Francisco and Oakland school districts and advocacy campaigns are underway in several other cities including Chicago. Related initiatives in higher education, such as the national student network Real Food Challenge (realfoodchallenge.org) that advocates for universities to align food procurement strategies with local, fair trade, and ecologically sound

food providers, do not have a significant presence among Chicago universities. In theory, policies that push for public and higher education procurement of local food could indeed spur future growth in urban and regional food systems in Chicago.

Meanwhile, as we shall see in the subsequent section, universities and colleges are beginning to take notice of efforts underway to help Chicago-area growers increase their production to feed more of the city. In 2014, for example, the Searle Funds at the Chicago Community Trust announced "Food: Land: Opportunity–Localizing the Chicago Foodshed" with the stated goal of providing funds toward "increasing the supply of local and sustainable food." Along with other local and regional food system funders such as Fresh Taste, the initiative seeks to increase land and business skills for producers as well bring capital investments into Chicago agriculture. Such efforts highlight Chicago's movement toward greater local production with an eye on how social equity can be built into local production and distribution processes. As policies and money continue to expand support for local and regional food-systems development in northeastern Illinois, questions emerge about access to and the availability of knowledge resources for supporting sustainable food production in the city. With the exception of a master gardener's program periodically offered in Chicago by the University of Illinois Extension in Cook County, most knowledge resources for sustainable food system development in Chicago have been developed at the grassroots level through assistance by nonprofits such as Openlands, NeighborSpace, Growing Power, and Advocates for Urban Agriculture. Though many land-grant institutions have urban programming across the United States, there has been limited assistance from traditional agricultural and food-systems advisors in Chicago. Yet universities in the city are large institutional players within the local food economy. They are not only enormous institutional food buyers, but also producers of food waste that could be diverted back into food production and distribution through composting and soil production. We conclude by turning to the question of how higher education institutions can support knowledge development and dissemination in pursuit of a socially equitable, economically just, and ecologically sustainable food system in the country's third largest city.

Higher Education and Sustainable Urban Food Systems: the Case of Chicago

Chicago was built during in the early 19th century on the transformation of nature into food commodities, first in the form of grains and later in the form of meat and processed food. The city has a deep history as a producer and processor of food for local consumption, though like most Midwestern cities, urban landscape was transformed from food production into industrial, commercial, and residential space. It is not surprising that up until very recently, there was not a higher education undergraduate degree program in agricultural science within Chicago, let alone the surrounding metropolitan area. Given the recent emergence of farming as a developing vocation in Chicago, it is not surprising that higher education curricular development in food-systems development first emerged in the form of community college curriculum. In 2009, the City Colleges of Chicago, in partnership with Windy City Harvest, a program of the Chicago Botanic Gardens, began a certificate program in sustainable urban agriculture accredited by the Illinois Community College Board. Based out of a branch of Daley College on the city's southwest side, the program includes an internship at a local urban farm. Operating in proximity to nearby Cook County Jail, where the Botanic Gardens had previously created a farming program, the Daley College certificate is seen as a way to move people from incarceration to

work in the emerging local food business. The educational facility and curriculum includes greenhouse production and an aquaponics system that, up until the 2011 urban agriculture ordinance, was only legal in the city within such educational institutions. More recently, Wright College, also part of the City College system, began offering online curricula in agroecology focused on employment in urban agriculture. Their unique model in the city integrates online classes instructed by faculty at the College of Agricultural, Consumer and Environmental Sciences at the University of Illinois Urbana-Champaign, one of the largest and most well established schools of agriculture in the United States.

This model offers an avenue for community college students to consider careers in urban agriculture through eventually completing a four-year degree in agriculture at the University of Illinois. The program also bridges the gap between traditional land-grant institutions with agricultural science curriculum—delivered in less urban localities—with higher education institutions situated in densely populated urban environments.

In general, four-year colleges and universities have been slow to adopt curriculum and research programs focused on sustainable urban food systems. One of the first such efforts occurred at Chicago State University (CSU). Supported by an initial grant from the City of Chicago in 2010, CSU, located on the far South Side of Chicago in a neighborhood classified as a food desert, opened an aquaponics facility in a former factory near campus. The facility produces tilapia, the waste of which circulates through growing beds to nourish hydroponically-grown plants. The system in turn supports an urban agriculture track for CSU students as well as provides a resource for community groups and schools to learn and develop technology. Later, grants from the USDA and U.S. Department of Education supported the facility and its integration into CSU's curriculum, including the creation of an Urban Agriculture concentration in the geography major. Also, numerous CSU graduate students have integrated aquaponics and urban agriculture into their theses. The aquaponics facility's director (co-founder and director of the non-profit Sweetwater Foundation) (http://sweetwaterfoundation.com/) converted the space into a community resource and meeting place.

CSU's aquaponics center built on and expanded the University's longstanding involvement in urban food-systems research through its Neighborhood Assistance Center (NAC). A decade earlier, the current NAC coordinator was part of a partnership of community groups and university researchers throughout Chicago who created the now defunct Chicago Food Systems Collaborative (CFSC) that established a network of food access and food-systems scholars and practitioners from across the city (Suarez-Balcazar et al., 2006). CFSC was supported by a grant from the W. K. Kellogg Foundation. The principal investigator on the grant was a national food justice spokesperson and organizer now based in the Twin Cities. A major result of the grant was a research study in Chicago's West Side Austin neighborhood (Block & Kouba, 2006). Additional work involved the promotion of a farmer's market in Austin and a salad bar pilot program in the cafeteria of two schools, one of the first projects of its kind in the city. Overall, the work of CFSC provided a foundation for many researchers of food access across the city. Along with a researcher's ongoing work on mapping and understanding challenges with food access in Chicago neighborhoods, some CFSC researchers would go on to become a major resource for community groups seeking to understand neighborhood food challenges and related social determinants of health. Before its dissolution around 2006, CFSC would include

researchers from several major urban universities including Chicago State, Loyola University Chicago, UIC, and DePaul University.

In time, each of the mentioned universities expanded support for local and sustainable food systems development. Chicago State, expanded food access research on Chicago and Northeastern Illinois (Block, Chávez, Birgen 2008). At UIC, the Center for Excellence in Elimination of Disparities developed a Food Equity Committee that brought together researchers from across Chicago to discuss policy initiatives including equitable development of local food systems. In 2013, Loyola University opened a new building for its Institute for Environmental Sustainability including an urban agricultural greenhouse and aquaponics systems. The institute recently launched Chicago's first Bachelor of Science in Food Systems and Sustainable Agriculture. The program's faculty are deeply involved with students in research and service on urban food production both off and on campus with gardens and a farmers market. Outside Chicago, Loyola has a 98-acre retreat and ecology campus where it operates a working farm for students to study sustainable agriculture. At DePaul, the Environmental Science and Studies department opened its rooftop greenhouse garden in 2008, and later established a curriculum on urban agriculture and community food systems. It currently is building a community soil lab where students test community garden soil at no cost. The College of Liberal Arts and Social Sciences created a Food Studies minor heavily focused on local and sustainable food systems. Through the University's Steans Center for Community-based Service Learning, DePaul established the Community Food Systems Initiative that engages faculty and students from across the university in service, research, and capacity building for growers and distributors across economically distressed neighborhoods. The Initiative provides direct research support for community organizations, gardens and urban farms seeking to advance food production and distribution processes. On campus, DePaul student gardeners formed the Urban Farming Organization that operates a corner lot garden where they produce food for donation to a pantry and to sell on campus.

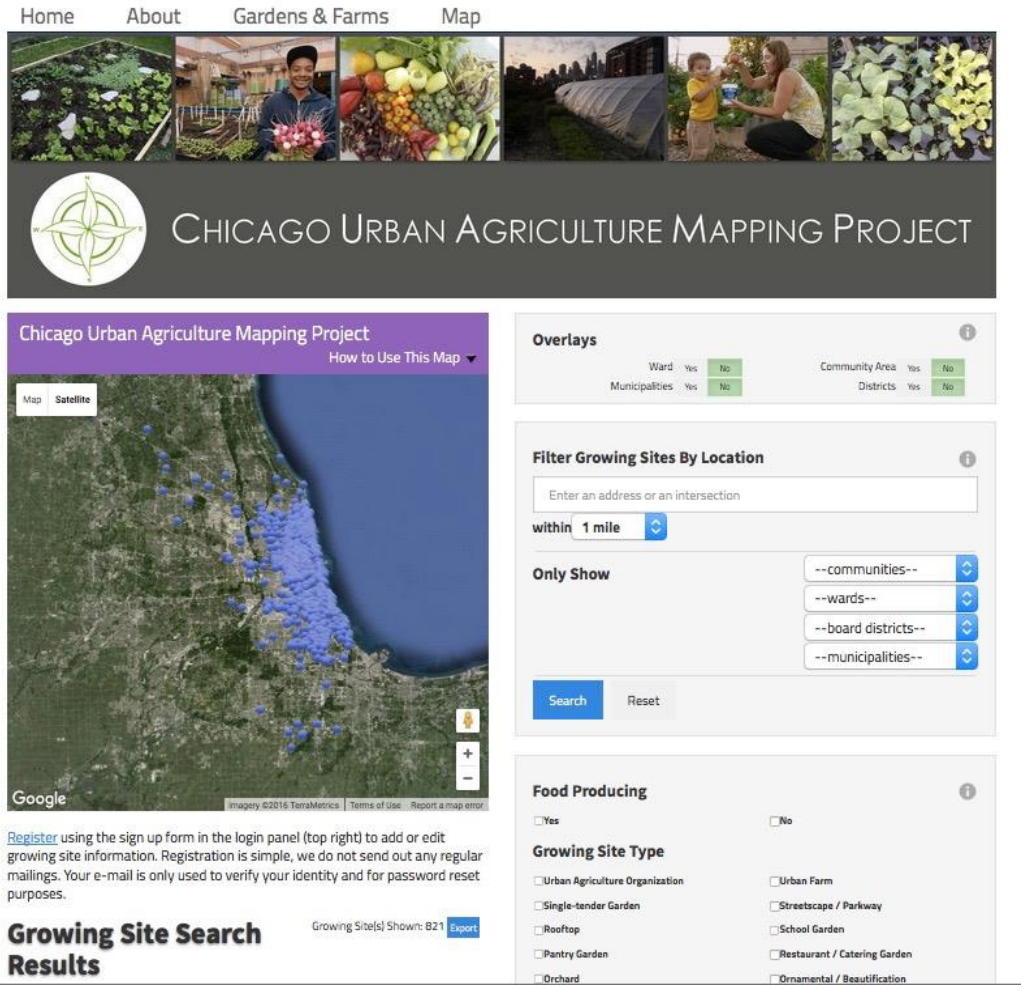
As urban agriculture policy and planning unfolded at the state and municipal levels during the past decade, almost all the major Chicago universities have added curricular, research, technical assistance, and community service focused on local and sustainable food systems. In 2012, along with a colleague at the Illinois Institute of Technology, which developed its own urban agriculture curriculum on Chicago's Southside, we organized a network of university faculty, staff, and researchers called the Chicago Higher Education Sustainable Food Systems Network (CHESFSN) in order to create dialogue that could lead to multi-institutional community-engaged and scholarly projects in support of sustainable food-systems development in greater Chicago. The group meets annually to share projects and curriculum developments and has hosted cross-institutional citywide tours of university gardens and food projects for students. Notwithstanding these efforts, very little is understood about the potential for Chicago higher education institutions to support building of a socially, economically and ecologically sustainable local food system, especially if institutions were to collaborate more intentionally. The goal of CHESFSN is to communicate across higher education specialties (faculty, researchers, technicians) about the activities of universities and colleges in addressing a core issue facing the Chicago region: ensuring a sustainable food supply. The hope is that further collaboration between institutions will develop.

Maintaining networks such as CHESFSN over the long term remains a challenge, given changes in faculty and staff and competing institutional agendas related to curriculum and research. Nevertheless, multi-institutional partnerships can and have emerged in Chicago focused on the city's food system. One important example of collaboration occurred in 2013 when three universities partnered with non-profit and community groups to produce a yearlong yield study of community gardens across the city (Rosing, Helphand, Vitiello, Odoms-Young, 2016). Researchers from the Steans Center at DePaul University, University of Pennsylvania, and the University of Illinois Chicago collaborated with NeighborSpace and several other community groups to carefully map all community gardens in the city. They then proceeded to work with gardeners to measure square footage and crop yields and to learn how they distribute their harvest. Building on an earlier study conducted in Philadelphia (Vitiello and Nairn, 2009), researchers conducted site surveys measuring food production and distribution in 260 gardens. In-depth case studies at seven sites were chosen to represent a cross-section of Chicago's community gardens included detailed crop plans and the weighing of crop yields. The Harvest Study, which plotted more than 43 acres of community gardens on a map, calculated an estimated 517,157 pounds of food produced from community gardens, most of which was harvested in low-income neighborhoods. Moreover, Chicago gardeners produced an estimated $1,665,698 worth of fruits and vegetables that went directly into households and through neighborhood and familial social networks, multiplying the gardens' impact on neighborhood food access. The study also measured nutrient levels of the city's community garden harvest, documenting, for example, an estimated 588,516 servings of collard greens worth 905,410 grams of fiber. Most importantly, the study highlighted the importance of community gardens to healthy food access for a large number of the city's residents. Similar to how the Chicago Food Systems Collaborative (CFSC) brought universities to the table to conduct research on food access on Chicago's West Side more than a decade earlier, the Harvest Study highlights how community-based organizations act as facilitators that coordinate higher education institutions and not the reverse.

One of the primary lessons learned in Chicago is that higher education has a supportive—rather than leadership—role to play in producing a more sustainable urban food system. As in the case of traditional agricultural—Extension, universities, and colleges have resources that can be deployed to support local growers and distributors, food educators, and policy advocates. As a follow-up to the Harvest Study, for example, the Steans Center at DePaul continued to support NeighborSpace, Advocates for Urban Agriculture and the non-profit Education, Agriculture, and Technology (E.A.T.) to complete a multi-year initiative to develop an online interactive tool for mapping and documenting urban agriculture in the city. Five years in the making, in March 2015, the Chicago Urban Agriculture Mapping Project (http://cuamp.org) launched a detailed database of more than 730 Chicago gardens and farms (see Figure 1). This ongoing project inventories and maps urban agriculture projects across the Chicago area, from small residential gardens to commercial urban farms. CUAMP aims to provide the public with a comprehensive inventory of urban agriculture in Chicago to which they can add and change data. In addition to serving as a tool for connecting gardeners, farmers, vendors, consumers, volunteers, funding sources, and others interested in urban agriculture, the tool will be used to study and better advocate for Chicago's growing urban agriculture movement. Visitors to cuamp.org are able to view and search for gardens and farms, each of which includes basic details such as the growing site category (e.g. community garden, urban farm, or school garden), ownership, and whether

food or other crops such as flowers or ornamental plants are grown. Users of the database are able to enter their own garden or farm or add information to one that already exists by filling out a brief questionnaire on the website. Administrators review submissions for publicly visible growing sites and college students vet the data to ensure accuracy. Community-university partnerships such as CUAMP offer the potential for higher education to support development of an important public resource that also contributes to student learning and faculty research across multiple institutions. In fact, Loyola and DePaul faculty have already been sharing use of the data in CUAMP on research projects with students. More collaboration is planned as the tool is further developed as a research resource.

Figure 1
Chicago Urban Agriculture Mapping Project Website



Conclusion

As interest in sustainable urban food systems grows within higher education, especially among students, new forms of community-engaged curriculum, research, and technical assistance through community service and grant-funded projects will likely emerge. The urban and community food systems movement is growing rapidly in the United States and as we have seen

in the case of Chicago, city governments are being pushed to respond to demands of farmers and gardeners who seek to grow food sustainably and to distribute it in new and socially just ways. Chicago growers continue to build off recent policy making successes and to push for increased opportunities to efficiently and effectively cultivate food in a space that was once filled with an abundance of fruit, vegetable, grain, and livestock production. New policy and planning efforts continue to encourage city, county, and state officials to envision Chicago as a year-round food-producing city. Meanwhile, one of the most important immediate measures that can be implemented by metropolitan universities and colleges is building local food into food service provider contracts. Procurement policies not only promote local food economies, but also encourage environmental sustainability and a justly compensated workforce. In addition to leveraging their food-buying power, higher education institutions can fashion community engagement initiatives that focus on capacity building for urban and peri-urban growers and distributors, engaging students and faculty in scientific research and service in the interest of expanding crop yields and ecosystems services in support of urban agriculture. As we have seen in the case of our own institutions, community-university partnerships that strengthen the potential for local populations to improve fresh food access, directly benefit faculty and students who gain knowledge from residents who understand what, how, and where food grows best in the environments where they live. These residents often know what major challenges exists—land, water, and soil access—that hinder further local and sustainable food systems development (e.g., Llorens-Monteserin and Rosing, 2016). These are challenges that universities—through research, technical assistance, and advocacy—can directly participate in resolving.

As members of the community themselves, universities and colleges can also be key players in urban and peri-urban food systems development through diverting their food waste production into municipal composting. Chicago itself is behind many North American cities in implementing municipal composting policies, however a statewide group, the Illinois Food Scraps Coalition, recently implemented an institutional composting campaign signed on to by several Chicago-based universities. How additional food scraps can be channeled into production of soil for growing food in the city remains an important topic for future policy making. Large and small universities and colleges can surely have influence on this process. Scaling up farming and gardening in Chicago, especially for those growers who have the least wherewithal, means not only land access but also access to healthy non-toxic soil. This challenge suggests an opportunity for university administrators to construct a robust community-engaged urban soil science curriculum that explicitly involves students and faculty in soil testing and remediation processes linked to local food production.

Once hosting a thriving agricultural sector, Chicago may again become a place that at least partly provisions itself through local production. Higher education can do much more to support the social, economic, and ecological contexts within which residents build a sustainable urban food system. In doing so, institutions need to recognize their own impact on local food economies. Students and faculty need to approach community-university food projects with a critical perspective. The perception that people in economically distressed neighborhoods want to grow food and that helping them to build gardens and farms is a solution to food access challenges should be carefully and critically examined (Rosing, 2012). There is a problematic perception that growing food locally is the solution to food access challenges that are rooted in the global political economy, income inequality and, as Philip Howard suggests, the inordinate power of

supermarkets in control of the food system (Howard, 2016, p.22). Supporting local control of the food system requires a reconsideration of institutional values on the part of university administrators; that is, to not only contract with food service vendors who will source food ethically, but also to look for ways to use institutional buying power to support development of Chicago farmers and gardeners whenever possible. Efforts are under way in Chicago to employ higher education resources to strengthen under-resourced local growers by institutionalizing community-engaged curriculum and research that can build the growing capacity of residents in economically distressed neighborhoods. Multipurpose tools such as CUAMP have the potential to further expand research and other forms of technical to urban farmers and community gardeners.

There is considerable work to be done to develop higher education institutions into resources that build the capacity of city dwellers to take part in local and urban food economies. What types of urban food systems curriculum can be developed by schools, colleges, and universities? How can such knowledge resources be made accessible to local residents? How can higher education institutions strategically channel resources—through technical assistance, research, service learning, internships, and community service—into local food systems development especially in economically distressed areas underserved by fresh food? How can metropolitan universities bridge the rural-urban agricultural divide; how can they become the connector between rural, peri-urban, and urban efforts to regionalize food systems to support economically, socially, and environmentally sustainable cities and contiguous rural areas? The case of Chicago universities and colleges, as we suggest, illustrates the emerging role of the academy not as expert—as Chicago growers have clearly shown themselves to be—but as capacity builder and provider of support to farmers and gardeners as they are challenged by local political and environmental conditions and the hegemony of the global food system. Given rapid growth of local and regional food systems in North American cities in general, universities, and colleges will increasingly need to evaluate their role in urban food systems planning, policy-making, and development from the perspective of procurement practices, research, curriculum, technical assistance, and perhaps most importantly, community-engagement that facilitates partnerships in support of equitable, sustainable fresh food for all residents.

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Interviewing Baltimore Older Adults About Food System Change: Oral History as a Teaching Tool

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Abstract

Urban food systems have changed considerably over the past half century. Older adults' descriptions of place-based, personal food system history can help inform student learning and may contribute to expert understanding of food system change. Structural and social shifts in food purchasing and consumption contribute to diet-related disease and loss of historical food cultures in cities. Modern efforts to improve food systems are rarely informed by history, despite the potential benefits. Students performed oral history interviews with Baltimore older adults. Transcripts were analyzed using an inductive grounded theory approach. Interviewees described a shift from food they perceived as natural and healthy to food seen as lacking freshness, with additives and poor flavor. Many mistrusted the food industry including retailers. Some emphasized benefits of modern changes such as reduced preparation time. Despite low incomes, interviewee concerns went well beyond food prices. We describe and reflect on insights from the oral histories, while presenting a case study of the use of oral history in graduate education. To our knowledge, this is the first paper describing oral history with older adults focused on the food system.

Keywords
History, Food culture, Qualitative interviews, Student project

Introduction

Older adults have a historic vantage point on social, economic, and environmental changes. Engaging with this population can offer valuable perspectives for students and researchers. Today's older adults have witnessed dramatic shifts in the food system (the system encompassing all aspects of producing, distributing and consuming food, everything that shapes those processes and that results from them, and all of the related relationships). Since 1950, the food system has grown increasingly industrialized, with larger and more globalized food businesses and fewer small farms (McLaughlin & Gomez, 2015). Options for consumer convenience have expanded, and many processed foods are now formulated to meet flavor, shelf life, and food safety goals (Cavender, 2015). Americans spend a far lower share of disposable income on food than they did 50 to 100 years ago (USDA ERS, 2016), though the food prices are much higher (Church & Stewart, 2013). Social changes over the past half-century, including changes in population dynamics, urbanization, women in the workplace, and level of parental influence over what children eat, have profoundly affected our diets.

Over the lifetimes of today's older adults, urban environments have also changed greatly. In 1970, Baltimore, Maryland had nearly one million residents. Today Baltimore's population is around 620,000, following decades of declining jobs in heavy industry, increased job opportunities in the suburbs, and demographic movement toward suburbs facilitated by car ownership and transportation networks (U.S. Bureau of the Census, 2014, 1995). The city's post-WWII racial composition also shifted significantly, as African Americans migrated to Baltimore from rural areas in the Carolinas and elsewhere in the South as part of the Great Migration. Meanwhile, redlining and fear caused many whites and later, middle class Blacks to leave the city (Pietila, 2010). Today Baltimore is 63% African American (U.S. Bureau of the Census, 2014). As industrial jobs disappeared, poverty increased, bringing with it social challenges.

As in other urban centers, many Baltimore supermarkets had closed or moved to suburban areas by the 1980s, due to factors including the need for more land to support larger stores and parking lots, reduced profit margins in urban areas, crime, and perceptions of crime (Eisenhauer, 2001). This loss of supermarkets reduced access to fresh, healthy food. While Baltimore still has many small stores, their characteristics have changed. Historically, such stores tended to specialize in fresh foods like produce, baked goods, or meats, whereas today they provide mostly processed and convenience snack foods.

Such changes have resulted in an urban food environment, both in Baltimore and nationally, characterized by limited fresh food access and high prices. These changes constrain opportunities to eat healthfully for many urban, low income residents, particularly those with low access to transportation and limited mobility (Gittelsohn et al., 2008; Morland, Wing, & Diez Roux, 2002). Today 25% of the city's population lives in areas characterized as food deserts (Buzcynski, Freishtat, & Buzogany, 2015). Despite these challenges, multiple studies suggest that low-income older adults are interested in eating fruits and vegetables, particularly farm-fresh produce. They also tend to make good use of services that make healthy food affordable and accessible, such as farmers market coupons and mobile produce trucks (Kunkel, Luccia, & Moore, 2003; Johnson, Beaudoin, Smith, Beresford, & LoGerfo, 2004; Smith, Johnson, Beaudoin, Monsen, & LoGerfo 2004; Abusabha, Namjoshi, & Klein, 2011; Middleton & Smith, 2011). Older adults, therefore, may represent valuable allies, partners, and a resource for food system change.

Oral History in Graduate Education

Adults aged 65 or older are the fastest growing segment of the U.S. population; by 2030, they will constitute about 19% of the population (Song, Simon, & Patel, 2014). Much can be learned from their insights about the past and present, and their thoughts as to what should be prioritized, moving forward. Oral history is one approach to gathering this information. The Oral History Association defines oral history as "a field of study and a method of gathering, preserving and interpreting the voices and memories of people, communities, and participants in past events" (Oral History Association, n.d.). This method has been used in education from primary through graduate levels (Sitton, Mehaffy, & Davis, 1983; Oral History Association, 2009; Ritchie, 2015; Donald & Tribbey, 2002).

The oral history project we describe was performed in each of three years as part of the Johns Hopkins Bloomberg School of Public Health graduate course, Baltimore Food Systems: A Case Study in Urban Food Environments, taught by Roni Neff and Anne Palmer at the time of data collection. This community-engaged eight-week seminar course included field trips to a supermarket, emergency food provider, urban farm, and peri-urban farm, and featured guest speakers from throughout the city food system. To further ground the students' understanding, many of the readings presented qualitative research and other documents providing in-depth insights on food systems. For their mid-term assignment, students performed oral history interviews with low-income older adults in East Baltimore to learn how this population perceives changes in the food system and to better understand what members of these older generations see as the most significant challenges and opportunities for change in today's food system. The findings were so compelling that after the first year we sought IRB approval to make the assignment part of a formal research study, which was performed from 2010-12.

This study addressed the following research questions: (a) How do interviewees perceive today's food system? (b) How do they describe changes in food and the food system since their childhoods? (c) How are their current dietary attitudes and behaviors rooted in past experiences? And (d) What do they see as top priorities for food system change in Baltimore?

Our goal in this paper is to share insights from older adults' comments about food and related cultural issues, and to discuss oral history as a pedagogical tool. Future analyses will examine their comments on food access and procurement.

Methods

Student Assignment and Training

Data collection took place during the aforementioned eight-week course annually from 2010-12. Students received training in oral history interviewing, performed readings on the method, and practiced with each other in class. A number had taken additional coursework on qualitative methods. The students received training in research protocols and ethics for working with human subjects, and completed the Collaborative Institutional Training Initiative (CITI) training module on human-subjects research. The assignment protocol detailed steps as described below.

Subjects

Course faculty established a relationship with a nearby residential senior center. The center provides one- or two-bedroom apartments to persons aged 62 or older with a maximum income of $30,000 for one person or $34,250 for two people. Apartments have fully equipped kitchens, enabling meal preparation. The center is located in a Baltimore neighborhood that in 2011 was 87% African American with a median household income of $18,522 (Baltimore City Health Department [BCHD], 2011). The neighborhood was classified as a food desert, with relatively low access to fresh foods and high access to energy-dense foods (The Johns Hopkins Center for a Livable Future, 2012). In 2011, it had a fast-food density of 10.9 restaurants per 10,000 residents (more than 4.5 times the city's fast-food density); a carryout-restaurant density of 34.9 per 10,000 (nearly three times that of the city); and a corner-store density of 10.9 per 10,000 (just

over the city's density of 9.0 per 10,000). Based on active transportation time for able-bodied adults, the nearest supermarket was 14 minutes away by foot—an important measure because 60 percent of residents in the area lack vehicles (BCHD, 2011). Heart disease and cancer rates were also above the city's already-high rates (BCHD, 2011). Many interviewees had lived in the immediate area before moving into this residence, while others had lived elsewhere in Baltimore.

Participants had to be at least 65 and lived in the Baltimore, MD area for at least 25 years. Recruitment was performed annually from 2010-12 by a staff contact who publicized the project and the opportunity for residents to sign up for interview time slots. The contact screened out individuals who might have difficulty completing the interview due to physical or mental health problems or English language competency. The contact also reserved a room where interviews could be conducted privately.

Data Collection and Student Data Analysis Procedures

Student investigator pairs conducted semi-structured 40-60 minute interviews exploring topics including food-related beliefs, preferences, behaviors, cultural influences, and food access and availability. The instructors sought ideas for additional questions from the class each year, but the guide remained similar. Table 1 provides sample questions. Student investigators were encouraged to follow the flow of the conversation so long as it remained generally on-topic, and to provide follow-up probes to elicit details. They were instructed to avoid personal questions, topics likely to cause discomfort, and information that could be deemed confidential. A teaching assistant or the instructor was available during all interview time slots in case a problem arose.

Table 1

Sample Interview Questions

What kinds of foods did you eat when you were younger?
How have your/your family's diets changed over the years?
How much time did you/your family spend on food preparation in the past?
Where did you get the food that you ate when you were younger?
Did you have a garden?
What is good/bad about the food environment now?
What do you think is needed to improve today's food environment?

Student investigators audio-recorded and transcribed the interviews verbatim. Individual identifiers were not collected. We obtained oral consent from all participants. Each participant received a $25 gift card. We maintained confidentiality by asking the site contact to assign interviewees anonymous codes, and placed these on sealed envelopes. The Johns Hopkins Bloomberg School of Public Health Institutional Review Board (IRB) classified the project as exempt (Protection of Human Subjects, 2016). In 2011 and 2012, we received IRB approval to share interview transcripts with interviewees as a keepsake, and most took advantage of this option.

Students summarized the interviews in five-page papers and five-minute in-class presentations. In both, students were encouraged to (a) focus on the material they found most interesting; (b) focus on that which their interviewees chose to focus most; and (c) to include direct quotes wherever possible. Each also provided a half-page (and single-slide) reflection on insights from the interviews. The current analysis used only the interview transcripts rather than these student summaries.

Current Study Data Analysis Procedures

Interview transcripts were coded by instructors and two research assistants using an inductive grounded theory approach. This approach identifies broad thematic categories that emerge from data through a rigorous and iterative process of initial and focused coding (Charmaz, 2006). Three transcripts were selected for independent initial line-by-line coding by all authors. Initial codes were used to develop a preliminary coding scheme consisting of focused codes organized into thematic categories. Four additional transcripts were then coded independently by all authors to ensure consensus and consistent application of the coding scheme. Definitions and exclusion/inclusion criteria were developed for each focused code. After discussion and additional refinement of the coding scheme, each transcript was coded independently by two authors. Pairs met to discuss their coding and address any inconsistent coding decisions. Throughout the coding process, the coding scheme evolved as new codes emerged from the data and existing codes and themes were further refined. Transcripts were re-coded as necessary to reflect these changes. All coding was conducted using ATLAS.ti (Scientific Software Development GmbH, Berlin, Germany).

Findings

Twenty-six interviews were performed with older adults living in East Baltimore in the spring semesters of 2010, 2011, and 2012. Two transcripts were omitted for audio-recording problems or administrative reasons, leaving 24 for analysis. Interviewee ages ranged from 65 to about 86 at time of interview, with a mean of about 72 (meaning they were born during the mid-1920s through 1947). Nine interviewees had lived in Baltimore their entire lives, and five had arrived in the 1940s to 1950s. Others had lived in Baltimore intermittently or full data on residential history were not collected. Some interviewees suffered from health conditions including asthma, allergies, broken hip, diabetes, or hypertension. Most were female and African American.

Interviewees described many changes in the food system between their childhoods and today. Overall they thought that the quality of the food system had declined. The changes they discussed fall into four categories: a) Valuing the flavor and tradition of fresh foods; b) Concerns about flavors and risks introduced by food additives and processing; c) Changing food preparation habits; d) Limited interest in food origins and limited trust in the modern food system. In addition, (e) participants described their top priorities for food system change.

Valuing the Flavor and Tradition of Fresh Foods

Nineteen of 24 interviewees described a reduction in food freshness, and many considered this to be the biggest change in food between their childhoods and today. Many said they preferred the

taste of fresh foods, particularly foods coming directly from farms or gardens. Most thought that food today in general did not taste as good as it had in their childhoods:

> You can really tell the difference. Back then the food was good; it was natural. Now, like I said with all this food and stuff, that's frozen … It just doesn't have the same taste to me. (Interview #6)

> Everything has changed! See ya'll don't know anything about that 'cause you're coming up in this era so you gotta take what you can get. See back in our day everything it was much, much better. The food tasted better, you know? (#25)

Beyond inferior taste, many felt that less-than-fresh or canned food had reduced nutritional value, though they generally did not mention specific nutritional changes of concern: "They should take some of the things they put in the cans, out of the cans. Because I think when they put it in the cans, they're losing something. The protein or the nutrients or something." (#13)

Many interviewees spoke appreciatively and nostalgically of food produced on farms or gardens. Twelve indicated they or their families had farms or gardens during their childhoods, while three currently had gardens. Some urban-dwellers spent childhood summers with rural relatives. For several interviewees, farms or gardens were the primary or nearly only food source in childhood. Some also described fishing and hunting as providing significant food in the past and/or as being regular pastimes then. Those who had these experiences commonly emphasized they saw rural fresh food as preferable to foods purchased in urban areas. For example:

> In the country the fruit was fresh fruit, because it's raised out—you could go look out and look at the trees and see apples, grapes, peaches, pears, and—fruit is better in the country than in the city, because it's fresh. (#7)

Interviewees also commonly contrasted meats purchased and consumed during their childhoods with today's pre-packaged meats. In addition to those whose families purchased meats from nearby butchers, many recalled a shopping area where their families selected live chickens that were slaughtered on the spot. Others had observed animal slaughter in rural areas. Most valued the freshness of these meats, with one describing it as "an altogether different taste than the chicken that you buy in the store" (#20). At least one described it, however, as "almost too fresh; I rather like the one that come from the market, already cured." (#25)

Many noted their families had intentionally sought out fresh foods and described going out of their way to obtain food fresher than the norm even at that time, whether from the docks, public markets, gardens, transported by rural relatives or other sources. Many of their families engaged in home food preservation in their childhoods, and interestingly, they generally associated these foods with freshness rather than categorizing them as canned or frozen: "We didn't have frozen foods back then, you know, everything was fresh … She [interviewee's grandmother] would can string beans, tomatoes, corn, okra, whatever." (#6)

Despite frequent negative remarks about industrially preserved foods, many interviewees indicated that they currently used their freezers for food preservation, particularly to enable them

to have the foods they wanted, of the quality they wanted, between shopping trips. Some also appreciated canned and/or frozen foods for their relatively low prices and convenience:

> There's a whole lot of things that cost a whole lot. Except for cans. I like canned goods. I like the fruits they have now. I can go to the Dollar Tree and buy canned foods for $1 a can. (#9)

Concerns about Flavors and Risks Introduced by Food Additives and Processing

The second-most frequently raised issue, discussed by 14 of 24 interviewees, was the increased use of additives and chemicals in both food production and processing, contrasted with what were sometimes referred to as "natural" foods. Many went on at some length on the topic and repeatedly returned to the theme, and five interviewees identified additives as the aspect of today's food system that they would most like to see changed. Most commonly, interviewees referred generically to "chemicals" or did not name the additive of concern. For example:

> Like with the Purdue chicken I just bought, they say it's no additives in it, a whole lot of stuff is not in it. They tell you on the package what has not been given to the chickens. So, I love me some chicken. (#24)

The most commonly specified additive was sodium, followed by hormones and growth promoters, preservatives, injections, grease, and pesticides. Often interviewees validated their statements by indicating that others too spoke of these issues. In discussing their perceptions of changed food flavor, interviewees frequently singled out meats. They generally did not specify the types of changes they experienced, though one did say meat today was more "chalky" and "crumbly," and not as juicy as it had been in the past (#6). Another described it as "gritty" (#26).

An underlying theme in discussing additives was mistrust of food producers and manufacturers, although this was not always articulated directly. For example, one noted, "You don't know what those people have put in [food]" (#24) and another explained, "I don't know what chemicals they're putting in the ground or in the hot house." (#6) In most cases the implication was of using additives to increase profits for producers or manufacturers, regardless of consumer impacts. About half of those mentioning additives discussed their effect on flavor, commonly implying the perceived change in flavor was an indicator something was not right with the food item itself, not just a source of personal displeasure: "And I bet you ask any person around their 60s or 70s and they will say the same thing. It's a difference in the taste now. It's maybe something they do to it." (#25)

Despite displeasure with the flavors many associated with additives, there were also a few comments indicating that interviewees enjoyed processed foods high in additives, but avoided them for health reasons – for example, "I haven't stopped eating the junk altogether, but I just try not to overdo it." (#19) In particular, multiple interviewees indicated or implied they saw processed foods as unhealthy due to sodium and/or fat content.

Many were also concerned about health impacts from additives used in food production, although most expressed generic concerns. A few specifically mentioned hormone disruption, though not necessarily by name: "The girls is looking like women...They coming out, they developing fast and everything." (#8)

In some cases, statements about current additive use seem to be rooted in direct childhood farm work knowledge contrasted with perceptions of today's farm production methods:

> The food back then had to be healthier, because these days they put all this stuff in them and feeding them, back then they gave them stuff that was good for them to make them better. But these days they put stuff in the food that makes a baby chicken into a chicken in three months. Now everything is strange, the food. Think about it. Everything is growing fast, the vegetables, the fruit. Used to take longer than a day to grow things and took a lot of work. Now they have machines, back then it was just our hands. (#20)

Surprisingly, given this interest in food produced without additives, few interviewees mentioned organic foods. One implied that organic food was desirable, but that the price is "so high you can't afford it" (#6). Table 2 summarizes concerns about additives across interviewees.

Table 2

Reported Concerns about Food Additives

Category	Concern	Perceived Reason for Use
"Chemicals" and other generic additives (14 comments)	• Health problems including high blood pressure and children "act[ing] crazy" • Poor taste, different taste • Fast plant/animal growth rates	• Profit for producers • Lack of oversight • Healthfulness • Faster cultivation
Salt (11)	• Salt is hidden (need to check labels) • Unhealthy (high blood pressure, short term physical symptoms, not medically permissible)	
Hormones, growth promoters (7)	• Unnatural effects on food • Unhealthy • Different taste • Premature female development	• Poultry size • Faster animal growth • Faster production
Fat, grease (6)	• Affects preexisting health conditions • Unhealthy • "Clogs up" arteries	• Good taste
Preservatives (5)	• Poor taste, different taste	
Injections (4)	• Poor taste, different taste	• To get it to market • "Purify" food items
Other additives mentioned: Pesticides (2); unspecified additives (3); miscellaneous additives (4); potassium in apple juice, "pumped up stuff," vitamins, water, wax (1 each).		

Changing Food Preparation Habits

Interviewees frequently commented on changes in dietary patterns since their childhoods, with emphasis on today's consumption of processed and prepared foods, and on the decline in cooking. Nostalgia for their mothers' cooking was frequently couched in terms of healthfulness.

When praising the healthfulness of their childhood foods, no interviewee commented on fat and salt in traditional Southern cooking (though a few did mention this in context of foods others prepared for current social gatherings). Generally, the interviewees seemed to be saying their mothers had done nutrition, cooking, and shopping the "right" way: "Well my mother did all the cooking. Nothing like mother's cooking. She always made sure it was nutritious and had the food groups." (#15)

Several discussed the substantial time their female relatives had invested in food preparation. With perceptions of this time-intensive and healthful cooking style as a baseline, many criticized today's mothers for not cooking as they and their forebears had, for their lack of cooking skills, for being "lazy," and for not providing healthy food to their children: "Lot of them lazy today now too. Nobody cooking every day, they … what they like, their chicken boxes, chicken and French fries, and children are happy. And that's fried, all that grease and all." (#22)

Several also acknowledged the challenges faced by modern families and expressed sympathy for this generation not having the opportunity to experience home cooked meals. For example, one stated, "Because their parents are working and don't have a lot of time–they buy fast food, get prefixed snacks, personal pizzas … I see that as people missing out on lots of things, like the old down-home recipes." (#5) Another said, "People are out of jobs, not having money to feed the family. It has been a rough road if you do not know how to cook from scratch and buy all the stuff." (#3) Many interviewees also recognized that changes over time, including the increased number of women in the workplace, had strengthened the value of speed and convenience:

> Women are working now. Back when I was a younger girl, most women didn't work, they were home raising their children. Well, things got so that the incomes needed mom and pop to work so then mother was gone out to work then the older sister started preparing the food, or … [bought meals, or] ate later. Everything has changed, it's changing every day. (#22)

Finally, despite the judgments expressed about eating convenience foods and despite their general preferences for fresh food, interviewees varied greatly in their own consumption of processed and prepared food. Some said they preferred to make their own meals due to health, flavor, or habit. Others avoided cooking because they thought they were not effective cooks. Many who indicated they consumed convenience food provided motivations that highlighted the mobility, financial, and health challenges faced by older adults. One expressed relief at not having to cook and noted: "Now, I have gotten a little older and I don't feel like standing over that sink cutting up greens and washing them, that takes up a lot of time." (#24) Another interviewee noted as a benefit of processed food that some could be purchased in measured portion sizes that were helpful in controlling food intake and avoiding food waste when cooking for one. Finally, a few said advances in processing enabled them to obtain reduced-calorie or low-sodium versions of foods they enjoyed.

Limited Interest in Food Origins, and Limited Trust in the Modern Food System

Many interviewees like shopping at farmers' markets, but none indicated they valued these markets for the chance to learn about the origins of their food; rather, they appreciated the food's freshness. Many expressed past or current preferences for particular farmers market vendors,

markets, or stores, often because they regarded the food as relatively fresh and thus trustworthy. This freshness was linked to the trustworthiness of a known seller rather than a trustworthy farm. Problems with food quality were viewed as systemic and there was generally not a sense that knowing the food's origins would increase trustworthiness. A few also expressed mistrust of government oversight of the food system, for example: "This so-called watchdog called the FDA isn't up to it. It doesn't make sense." (#5) With the exception of those who grew their own food, interviewees had little specific knowledge of where their food originated, either today or in their childhoods. Nor did they seem concerned. For example: "How would I know where it was grown at? … All I know is I could go to the store and get it." (#21)

Interviewees often expressed mistrust of store or food company business practices. Several thought their neighborhoods had lower quality foods than those "farther out," such as in Baltimore County, and voiced concerns that retailers were motivated more by greed than by serving customers properly. Some noted stores they would not patronize due to poor food quality or unsanitary conditions:

> They giving us poor choice meats and things and go and charge us like its high price. And people my age know the difference, or they better know the difference. (#26)

> "People need to stop being so greedy, and trying to sell you defective food, food that has been in the market too long. The expiration date has passed, and they expect you to buy it. They are so greedy over money. (#5)

Interestingly, while such discussions might seem to be "about" food safety, food safety concerns were rarely discussed directly, and interviewees did not indicate worries about foodborne illness. Indeed, several stated they thought the overall food supply was safe. Though food safety risks were objectively far higher during their youths than today, no respondent mentioned past concerns about foodborne illness or a change in food safety over time.

Top Priorities for Food System Change

Interviewees were asked to identify their top priority changes for improving the city's food system, including themes covered in our companion analyses, such as access and cost. Table 3 presents responses from 17 interviewees, including four who indicated two top priorities. Other interviewees did not clearly identify top priorities. The last column indicates priorities about which speakers spoke passionately, separate from the question about their top concerns. This column demonstrates the primacy of additives and food freshness among interviewee concerns, even compared to issues such as cost and access.

Table 3

Most Important Priorities for Improving Baltimore's Food System

Priority	Top priority (#)	Other mention (#)
Address additives/processed foods, and foods that are less natural or fresh	6	4
Reduce food cost	5	0
Improve access	3	3
Address greed by those in the food industry	3	0
Reduce fast food use/availability	2	0
Return to old ways generally	1	0
Improve food taste	1	0
Increase nutrition education	0	3

Discussion

Reflection on Oral History as Pedagogy and Relevance for Other Institutions. This project provides a case study of the use of oral history to enhance student education. A key goal in the Baltimore Food Systems class is to bring the challenges and opportunities of an urban food system alive for students. We seek multiple opportunities for engagement, including tours, discussions with guests, shopping in community-based stores, and service-learning projects.

Oral history has many benefits for education. It gets students out of the classroom and contributes an additional dimension to learning by encouraging them to have in-depth conversations with real people about issues meaningful to them. Interviews thus help bridge the cultural divide between local low-income older adults and graduate students who have often come to the city only for their degree programs, and who commonly have middle and upper middle class backgrounds. It also reminds students that in efforts to make change, there is no substitute for talking directly with those who may be affected, including seeking out those who are often ignored. The project further benefits students by advancing their skills in interviewing, listening, qualitative research, teamwork, and research ethics. Over the years, both students and older adults have told us how much they valued this experience. As such, the project could contribute to a more positive perception of the university among community members. Finally, and as evidenced by this study, oral history projects can also generate valuable data for dissemination and the furthering of scholarly and public understanding of often marginalized voices.

The method presents several challenges. First, sending students out to perform oral history interviews involves a level of trust in their respectfulness, appropriateness and capabilities. It is usually not possible at the time of class planning to know what the students will be like, and even with known students, problems can occur. For example, one year with a different oral history assignment, we received feedback that a student had been inattentive during the interview, insulting the interviewee. The situation turned into an opportunity for student learning, and the interviewee appreciated we took her concern seriously. We encourage interviewees to let us

know of any concerns both through the site contact and the consent form. Another challenge lies in building adequate interview skills in a course with a different focus. The skill of avoiding leading questions has been especially challenging to our students. We address this with longer practice opportunities during training. Lastly, there is the concern about what messages students take away from the experience. Precisely because the personal stories learned through oral histories can be so powerful for students, it is important to remind them that the comments of their interviewees may not be generalizable.

On the logistical side, given our interest in the students finding local lower income older adults to speak with for this assignment, we felt it important to arrange the contacts for them. It can take some effort to identify and establish a relationship with a person having the right connections and interest in facilitating the effort. Logistics of scheduling interviews may also be complicated. In other oral history assignments we have given, such as with family members and schoolteachers, it was easier to find interviewees and students, since they had already developed their own connections.

Discussion of Findings

This study focused on the following questions: (a) how do the interviewed older adults describe food system changes since their childhood? (b) how do they describe today's food system? (c) how are their current dietary attitudes and behaviors rooted in past experiences? Finally, (d) what do they see as priorities for food system change in Baltimore? We believe this is the first study examining older adults' views of food system change or perceptions of today's food system.

Overall, the older adults described a dramatic shift from a food system they viewed as relatively natural, healthy, and communal, to one they perceive as providing food lacking in freshness, with poorer taste, replete with additives, and that enables people to avoid home cooking (which they see as healthier than eating prepared and processed foods). Among the most frequently reported changes was a decline in food flavor. Many interviewees described mistrust of food producers, processors, and purveyors today, in contrast to a seemingly unquestioned trust in the past. Not all food system shifts were viewed unfavorably. In particular, some valued the opportunity to avoid or reduce unwanted time spent on food preparation and to purchase packaged foods in small portions or formulated with benefits such as reduced sodium.

The older adults generally recognized the social changes that have contributed to today's food system, and some questioned whether it is possible to go backward toward the food system of their childhoods. Yet, their priority list essentially reflects a desire to, at minimum, incorporate valued qualities of their childhood food system into a future food system.

Older Adults and the Flavor of Modern Food. Might the ubiquitous reports of changed food flavor be rooted simply in the older adults' altered senses of taste with age? Although sense of smell and taste may decline with age in some people, particularly those in poorer health, (Sulmont-Rossé et al., 2015), we believe for two reasons this is not the sole explanation for the results of this study. First, there is objective support the changes these older adults perceive. Studies document differences in flavor as foods age (Gray, Gomaa, & Buckley, 1996; Kader, 2008), as well as for meats and dairy produced from pastured animals versus others (Urbach,

1990; Priolo, Micol, & Agabriel, 2001). Additionally, cultivar selection has shifted over time from those chosen for flavor or nutrition, to those that can produce the highest yield or that are most resilient to the time and physical requirements of the modern food distribution system (Davis, Epp, & Riordan, 2004). Second, it is notable that the older adults focused much of their discussion of changed food taste on meats, seconded by fruits; if their senses of taste had changed, presumably this would affect their perceptions of all foods.

Preferences for Freshness and Naturalness. Today's food system is dominated by processed and prepared foods, particularly in low-income areas such as the Baltimore neighborhood where these older adults live. Such foods have often been formulated for palatability, with extensive taste testing – and many consumers find them difficult to resist (Kessler, 2010). It is notable, then, that although the older adults valued some of the convenience attributes of these foods, they generally did not indicate they preferred processed foods to fresh and home-cooked foods based on flavor.

The preference for food that is fresh, natural, and home-cooked may have multiple roots. First, there is personal nostalgia and the lifelong norms and preferences shaped by childhood diets. To date, only a few social science studies have examined older adults' food preferences, attitudes, and behaviors (Koehler & Leonhaeuser, 2008; Song et al., 2014; McKie, MacInnes, Hendry, Donald, & Peace, 2000; Monturo & Strumpf, 2014; Smith, Kromm, Brown, & Klassen, 2012; Falk, Bisogni, & Sobal, 1996). Resonating with our findings, those studies commonly emphasize the importance of childhood in establishing lifelong approaches to food, and in developing ideals for eating patterns. It is notable that as our interviewees idealized the Southern cooking of their childhoods, none mentioned the high fat and salt content as a potential negative. Rather, such cooking was seen as beneficial to health because the food was fresh and home-cooked. Some said they had had to give up some traditional foods they loved due to fat and salt content – but these discussions were never linked to questioning childhood diets, perhaps because resultant health conditions were not evident.

Cultural nostalgia is another contributor to interviewees' preferences for fresh, home-cooked foods. Biltekoff (2010) writes "our reverence for nature and things that seem natural is closely connected with a related belief that life was healthier and more wholesome during a 'golden age' in which people lived on the land in rural or farm areas, worked hard, and ate hearty meals that were cooked by a devoted mother and enjoyed at the family table." These associations with naturalness came through strongly in our interviews. It may be that, in being linked with nostalgia, such cultural views might be stronger in older adults than in others. Indeed, it is possible these historically-focused interviews unintentionally primed interviewees toward personal and cultural nostalgia and thus toward such associations.

Third, rural roots may have affected this preference for many of those who grew up eating fresh and natural foods from farms, gardens, and hunting. Beyond personal nostalgia, the connection may also have been conceptual, as food choices can reflect identity. Southerners in Baltimore and other Northern cities experienced much pressure to assimilate. Some, mostly from the middle class, did assimilate, but for many Southerners (and presumably others from rural areas as well), their rural roots became a point of identity and pride (Zeiderman, 2006). For them and their children, an affinity for fresh foods, associated with rural farms and gardens, might become

part of their identity. At a deeper conceptual level, Zeiderman quotes Williams (1973): "The pull of the idea of the country is towards old ways, human ways, natural ways."

A fourth reason for the interest in freshness and naturalness is that these qualities are associated with health, both by nutritionists and in popular discourse. Similar to our findings, in a qualitative study of healthy food perceptions among African Americans of diverse ages, about a third of 33 participants indicated organic and "natural" foods are healthy, and about a sixth expressed the complementary idea that "chemicals," "artificial things," and "preservatives and additives" are unhealthy (Lucan, Barg, Karasz, Palmer, & Long, 2012). By contrast, many consumers view technology in food as 'unnatural' and 'artificial.'

Trust in the Food System. The interviewees exhibited substantial mistrust of food producers, processors, and sellers in today's food system. This mistrust seemed to be rooted primarily in the idea that businesses would prioritize profits over flavor, nutrition, or safety. As reviewed by Zachmann and Ostby (2011), nearly all the academic literature on trust in food focuses on concern about illness risk. While in this older population illness and the other possible impacts were certainly risks, the underlying emphasis was more about being wronged. The emotion underlying the mistrust was more frustration or anger than fear. A similar attitude was identified in a group of Scottish older adults (McKie, MacInnes, Hendry, Donald, & Peace, 2000.)

Several factors could contribute to this mistrust. First, trust is relatively fragile and can be damaged more easily than built (Slovic, 1993). Negative focusing events including food safety scares receive more media attention and notice, and are given greater weight, than positive events (Slovic, 1999). Indeed, recall of food safety events is a top determinant of consumer trust in food, although recall and concern fade with time (de Jonge, Van Trijp, Renes, & Frewer, 2010). Many consumers also distrust technology use in food production, seeing it as "unnatural" (Knox, 2000; Lusk, Roosen, & Bieberstein, 2014). Risk perception is further affected by many factors including a person's relative social position, with women and minorities perceiving greater risk than white men (Slovic, 1999).

There is extensive evidence of racial and ethnic differentials in trust levels, commonly attributed to historical and ongoing discrimination experiences (Smith, 2010; Taylor, Funk, & Clark, 2007). Experience of neighborhood disorder can further affect trust of a "generalized other," both directly and because it affects feelings of powerlessness (Smith, 2010; Taylor et al., 2007). Further contribution to mistrust occurs through direct experience of bias, as well as parental preparation for bias. Some studies focus specifically on trust in businesses; however, there is only limited demographic segmentation within such studies and little evidence to date of trust differentials by race (Adams, Highhouse, & Zicker, 2010; Lang, 2013).

More specific to trust of food, one study among low-income consumers identified widespread concern about risks generated throughout the food system (Webber, Sobal, & Dollahite, 2010; Webber & Dollahite, 2008). As with the overall trust literature, there are relatively few studies of trust in food segmented by demographics. Particularly relevant here, Knight and Warland (2004) examined sociodemographic variation in consumer concerns about multiple types of food safety risk. They found that African Americans and those over age 65 held greater concerns about all types of risk than did others, though the relationships were not always statistically significant.

The authors suggested these groups may perceive themselves as facing greater vulnerability to hazards than others—in the case of the elderly due to their age, and African Americans due to discrimination. Correspondingly, this sense of risk could be linked to a sense of control; these populations and those in our interviews may have relatively little control over the foods they eat and hazards therein.

Strengths/Limitations

We discussed the strengths and limitations of the oral history method above. This project has several additional strengths. It is the first study to examine older adults' perceptions of the food system and of food system change. The qualitative data collection and grounded theory methods were beneficial in an exploratory study, aiding in characterizing the subjects' underlying perceptions and views. Additionally, because the study incorporates data collected across three annual offerings of the course, subject responses are unlikely to be unduly influenced by issues in the news at a particular time.

There are several limitations. First, those at the senior center who chose to be interviewed may have been more interested in food and nutrition than others. As in other qualitative studies using convenience samples, it is not possible to generalize broadly about the findings and their applicability. Second, it is possible there were secular changes over the three years of the study. Third, older adults' perceptions, particularly of past food experiences, were dependent on their abilities to accurately recall those experiences. Fourth, while all of the (mostly graduate student) interviewers had received training, some had taken prior coursework or had more native skill as interviewers than others.

In a few cases, interviewers asked leading questions. We sought to filter those from the data by coding them as such and excluding them from analysis. In addition, complete demographic data also was not collected due to inconsistently asked questions. Consequently, we may not have captured differences in how a person interacts with the food system based on factors such as gender, race, age, or education. We also note that while it is common in oral history work to share participants' identities because the stories are specific to their lives, for the purpose of this student assignment and ease of IRB approval, we chose to present the results anonymously. A repository of food system oral histories performed with older adults would be a valuable future project.

Conclusion

Older adults are witnesses to history, and they have important insights to share. This study provides a chance to listen to one group of them and an example of oral history as a class assignment. While some might assume the main concern among these primarily low-income older adults would be food prices, interviewees also reported strong concerns about freshness and additives, mistrust of food producers and sellers, and an overall dismay about the state of the food system being passed on to their grandchildren.

Interviewees described priorities for food system change that, importantly, dovetail with many of the priorities embraced by food system reform advocates. While we have considered a number of

motivations for the perspectives of older adults, it is important to note many of these views are shared by a growing segment of the U.S. population. Interventions to improve access to farm-fresh produce, such as the USDA Senior Farmers Market Nutrition Program and programs to support price reductions in fresh and unprocessed foods, could go a long way toward addressing some of these older adults' largest frustrations. Additionally, improved governmental investment in oversight of both producers and retailers might also be valuable in responding to the older adults' concerns and in reducing the extent of mistrust.

Older adults' experiences provide valuable knowledge of food-systems change. Their insights are tied to direct experiences with another type of food system, one that shares qualities with the food system many advocates would like to see. Having lived through those times, they also recognize limitations of the food system of their childhoods, including gender roles and time required for food preparation. Drawing out this knowledge through interviews enabled students to connect with and learn from the experiences of a different generation, and gain a fresh perspective on the vast changes our food system has undergone in the last few decades. This is a clear asset to the education of public health students who will in many cases work to shape policy and programs upon graduation. Older adults, in turn, told the interviewers they enjoyed sharing their experiences with a younger generation. By engaging in oral histories with older adults, educators, interventionists, and other advocates can ensure that they are recognized as valued and important contributors to systems change.

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The Urban Food Hubs Solution: Building Capacity in Urban Communities

Sabine O'Hara

Abstract

Access to affordable fresh food is an ongoing challenge for underserved urban neighborhoods across the United States. Several are designated food deserts with no access to a full-service grocery store within a one-mile radius. The Urban Food Hubs of the College of Agriculture, Urban Sustainability, and Environmental Sciences (CAUSES) of the University of the District of Columbia (UDC) exemplify the University's commitment to building capacity in the food desert neighborhoods of Washington D.C. The four components of the Urban Food Hubs are food production, food preparation, food distribution, and waste and water recovery (http://www.udc.edu/category/causes). They are designed to not only provide access to fresh food, but also to create jobs, improve public health, mitigate water management problems, and create urban resiliency. The contributions in economic, social/cultural, and physical/environmental impacts, and the five pillars of economic development that track the broader impacts of urban capacity building are described here. The Urban Food Hubs demonstrate the investment metropolitan universities could make to ensure the long-term economic, social, and environmental health of each community. The model is scalable and replicable in other metropolitan areas, including those that experience high pressure on land-use and those experiencing decline.

Keywords
Capacity building, Urban food systems, Urban agriculture, Urban sustainability, Resilience, Community-based economic development

Introduction

Universities have long played an important role in building the economic capacity of the communities they serve. Universities provide employment, offer education and training, and conduct research to meet the economic, social, and environmental development needs of the future (Abel & Dietz, 2012; Porter, 2007; Siegfried, Sanderson, & McHenry 2007). Metropolitan Universities, those that serve urban and peri-urban communities, play a particularly important capacity building role given the diversity and disparity of urban communities. Most cities are bifurcated; some neighborhoods have high household incomes, high education levels, low unemployment, and abundant access to amenities and services; others have low household incomes, high unemployment, and limited access to everything from medical services to restaurants and fresh food (Berube & Homes, 2015; Baum-Snow & Pavan, 2011).

As the only public university in Washington D.C., and the only exclusively urban land-grant university in the United States, the University of the District of Columbia (UDC) and its College of Agriculture, Urban Sustainability, and Environmental Sciences (CAUSES) developed a focus on urban agriculture and urban sustainability to address the needs of its diverse urban

constituencies. This unique focus finds expression in the UDC Urban Food Hubs initiative. The Urban Food Hubs seek to improve quality of life and economic opportunity through a comprehensive urban food system that meets the needs of both the underserved neighborhoods lacking access to fresh food and the high-end markets associated with the fast growing local foods movement (O'Hara, 2015).

Unlike some of the shrinking metropolitan areas in the United States, which have developed a focus on urban agriculture to find new uses for abandoned neighborhoods, the Washington D.C. metropolitan area is growing. It is therefore an ideal location to test the viability of an urban food system that can compete in an environment of strong land-use pressures. The four components of the UDC Urban Food Hubs—food production, food preparation, food distribution, and waste and water recovery—are designed to establish: (a) high-efficiency urban food production sites; (b) commercial kitchens to improve nutritional health and add value by turning produce into food products; and (c) green infrastructure that remediates urban soils and improves water use efficiency. Each Urban Food Hub is a business incubator to create jobs and address health disparities. As will be discussed in a later section of this article, this makes the UDC Urban Food Hubs more comprehensive than the food hubs definition of the United States Department of Agriculture (Barham et al, 2012).

There are direct and indirect benefits of the UDC Urban Food Hubs and investing in them is a way to operationalize the capacity building mission of metropolitan universities. Beyond implications for Washington D.C., the Urban Food Hubs can serve as a model for economic development that focuses on economic, social, and environmental benefits. By making the social and environmental impacts the focus of economic development, the measures of economic development success are redefined to ensure more sustainable outcomes. Table 1 summarizes the four components, locations, and programs of the UDC Urban Food Hubs in Washington D.C.

Table 1

UDC CAUSES Urban Food Hub

UDC Urban Food Hubs	Food Components (and Related Education) (Sustainable Economic, Social, Environmental Health)				Student, Faculty and Community Engagement
	Production	Preparation	Distribution	Waste & Water	
Van Ness campus Ward 3	Green roof, hydroponics, aquaponics	Commercial kitchen teaching kitchen	Farmers market; CSA; restaurant contracts	Rainwater harvest; water runoff reuse	Experiential learning, research, land-grant workshops, demonstra-tions, certificates
Betrie Backus campus Ward 5	Hydroponics, aquaponics, native plant nursery	Commercial and teaching kitchen under construction	TBD	Rain garden design, installation, and maintenance	TBD
East Capitol Urban Farm Ward 7	Aquaponics, raised bed gardens	Food truck	Farmers market	Rain garden; rice field	Land-grant workshops, demonstrations, and certificates; research
PR Harris campus Ward 8	Hydroponics, aquaponics, raised bed gardens	Food truck	TBD	TBD	TBD

Why Urban Food Hubs?

The University of the District of Columbia is a comprehensive, public, minority serving, land-grant university that was formed from three precursor institutions: Washington Technical Institute, Federal City College, and D.C. Teachers College. Of all the land-grant universities in the United States, UDC is the only one that serves an exclusively urban territory (National Research Council, 1995). In 2011, the University formed its College of Agriculture, Urban Sustainability, and Environmental Sciences (CAUSES) to reaffirm its urban land-grant mission, and to bring the university's land-grant programs into closer alignment with its academic programs.

CAUSES set out to embrace its unique mission and develop a focus on urban agriculture, urban sustainability, and resilience. The college offers academic programs in architecture, health education, nursing, nutrition and dietetics, urban sustainability, urban agriculture, and water resources management. The applied research and community outreach functions—typically offered through separate Agricultural Experiment Station (AES) and Cooperative Extension Service (CES) programs—are combined and offered through five land-grant centers that are aligned with the college's urban agriculture and urban sustainability focus. Centers include the Center for Urban Agriculture and Gardening Education; the Center for Sustainable Development and Resilience; the Center for Nutrition, Diet, and Health; the Center for Architectural Innovation and Building Science; and the Center for 4-H and Youth Development.

The mission statement of CAUSES affirms the college's commitment to "… offer research-based academic and community outreach programs that improve the quality of life and economic opportunity of people and communities in the District of Columbia, the nation, and the world." In 2013, CAUSES adopted its tagline *Healthy Cities – Healthy People* to affirm its capacity building mission as inextricably linked to improving the environmental/physical condition and the social/cultural condition of the urban community it serves. The commitment to improve quality of life and economic opportunity must therefore be understood as a commitment to improve not only economic outcomes, but also the social/cultural and physical/environmental context within which every economic activity takes place (O'Hara, 1995, 1997).

To give practical expression to this commitment, CAUSES developed an Urban Food Hub model. Like most cities, Washington D.C. is bifurcated. Administratively, the city is organized into eight wards. Ward 8 has the lowest median household income level of $32,000 per year, an unemployment rate of close to 20%, and 90% of its residents are African or African-American. Ward 3 has a median household income of $110,000 per year, an unemployment rate of less than 4%, and 5% of its residents are African-American (United States Bureau of the Census, 2014).

Similar disparities are evident in food security and health parameters. The United States Department of Agriculture defines food security as "… access by all people at all times to enough nutritious food for an active, healthy life" (United States Department of Agriculture, 2014). Low food security implies that high quality food is unavailable at least some of the time for some people. Wards 5, 7, and 8, the three D.C. wards with the lowest income levels, are home to 34% of the population, yet less than 10% of the city's grocery stores are located there (see Figure 1); and less than 10% of the 520 self-identified food retailers in Washington D.C. offer an adequate variety of fresh produce to support a healthy diet.

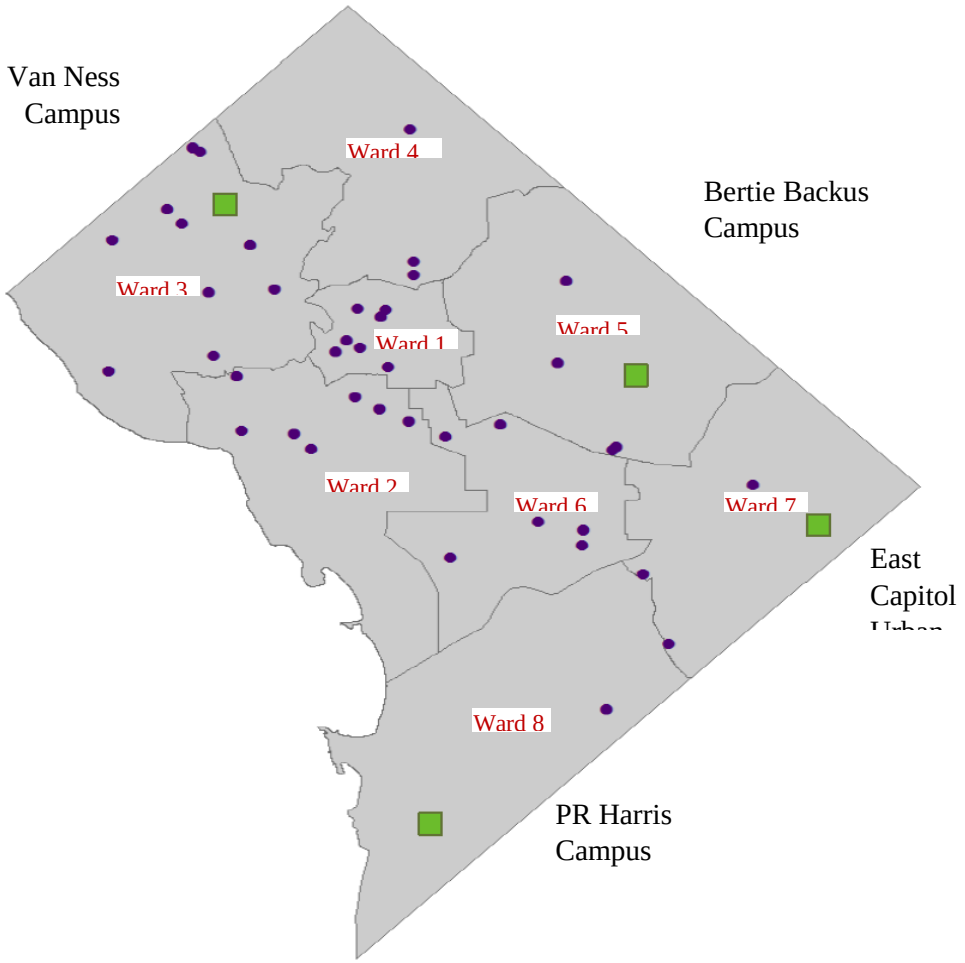

Figure 1. Full-service Grocery Stores and Urban Food Hubs in Washington D.C. The result is food insecurity for a significant number of D.C. households: 13% report being food insecure; 19% experience food hardship; and 37% of households with children were unable to get enough food (D.C. Department of Health, 2013). Among the damaging effects of food insecurity on children are impaired cognitive development, reduced school readiness, lower educational attainments, and slower physical, mental, and social development (Cook et al., 2006; Nord, Coleman-Jensen, Andrews, & Carlson, 2010).

Another concern stems from the declining nutrient content of some of our food (USDA, 2014). One contributing factor is the increased time between harvest and consumption. To accommodate the time spent in transport, produce is harvested before it ripens. Populations in urban areas on the east coast of the United States are especially vulnerable since California is the top producer of fruits and vegetables. This calls for an increase in the production of nutrient

dense produce closer to where the majority of consumers live, namely in metropolitan areas on the east coast of the United States. Growing perishable food closer to where consumers live also reduces the energy use associated with food transportation (Canning, Charles, Huang, Polenske, & Waters, 2010; Weber & Matthews, 2008).

Historically, cities are not locations where much food has been grown (Gorgolewski, Komisar, & Nasr, 2011; United Nations Development Program, 1996). Firebird Farm, the UDC research farm located just beyond city limits in Beltsville, Maryland, seeks to change that. It is dedicated to urban agriculture and its research focuses on how to produce food sustainably in urban neighborhoods where space is a premium. The UDC Urban Food Hubs take the UDC farm into the city. The focus extends beyond farming to a comprehensive food system that supports skills development and job creation through food production, food preparation, new food distribution methods, and waste and water recovery. Similar to the Cooperative Extension offices that have shaped the capacity building mission of land-grant universities in rural counties across the United States (USDA 2015; USDA NIFA 2014), the Urban Food Hubs seek to build capacity in urban neighborhoods by focusing on the entirety of the urban food systems from food, to health and wellness, and green infrastructure.

What is an Urban Food Hub?

According to the Agricultural Marketing Service (AMS) of the United States Department of Agriculture (Barham et al., 2012), a food hub is "a business or organization that actively manages the aggregation, distribution, and marketing of source-identified food products primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail, and institutional demand." This definition emphasizes the distribution component of the food system. To quote AMS, "Food hubs are an important subset of food value chains … By offering a combination of aggregation, distribution, and marketing services at an affordable price, food hubs make it possible for many producers to gain entry into new larger-volume markets that boost their income and provide them with opportunities for scaling up production."

The UDC Urban Food Hubs further broaden the food hubs definition of the AMS. The reason for this comprehensive approach is that many urban dwellers have become distanced from their food source. Fresh unprocessed food is often unavailable, and there is a disconnect between consuming food and knowing where and how it is grown. Often the interest in the quality and origin of food is first triggered by an interest in cultural associations of food, or by a concern for food-related illnesses like obesity, diabetes, and hypertension (Brown & Jameton, 2000; Webber & Dollahite, 2008; Raj, Raja, & Dukes, 2016)

Urban food production also intersects uniquely with urban sustainability considerations like storm-water management and waste reduction (Barthel & Isendahl, 2013; O'Hara, 2015). Urban gardens, for example, increase permeable surfaces and green roofs absorb storm water run-off. Both reduce pressure on urban storm water systems that are at capacity in many of our cities (Agudelo-Vera, Mels, Kessman, & Rijnaarts, 2011; James, Magee, Scerri, & Steger, 2015; Lovell, 2010;). When food is produced in densely populated urban communities rather than in sparsely populated rural areas, issues like integrative pest management and mitigating heat islands must also come into focus (Li, Bou-Zeid, & Oppenheimer, 2014; Wittmer et al., 2010). The four components of the UDC Food Hub address these complex connections:

- food production through bio-intensive methods, hydroponics, and aquaponics;
- food preparation through kitchens that add value and offer nutrition education;
- food distribution through farmers markets, CSAs, restaurants, and niche markets; and
- closing the loop through composting, water harvesting, rain gardens, and other green infrastructure initiatives.

Each of these four components offers opportunities for business development, training, and improved resilience (see Figure 2). The Urban Food Hubs seek to form a decentralized network of local food centers that improve food security, nutritional health, job creation, and resilience especially in urban neighborhoods that have deficits on all counts.

The idea of strengthening local economies by replacing imports with local goods and services produced in decentralized local business networks is not new (Florida, 2005; Schuman, 2015). It has been called leak-plugging or re-localizing production (Schuman, 2002; New Economics Foundation, 2014). There are two principal strategies: to attract businesses to relocate in the community and to grow businesses from within. The UDC Urban Food Hubs promote the latter by focusing on local entrepreneurship.

Each food hub comprises a cluster of business opportunities for entrepreneurs who ideally come from the neighborhood where a Food Hub is located. Local entrepreneurs receive training and technical support to implement their business plans. These can range from a health-focused business that maximizes nutrient yield and offers health assessment and nutrition counseling; to growing micro-greens and herbs for high-end restaurants; to ethnic crop production for local niche restaurants and grocery stores; green roofs that serve as food production and event space; and native plant seedlings grown for urban parks and rain gardens (O'Hara, under review; Ackerman, Dalgren, & Xu, 2012; Royte, 2015).

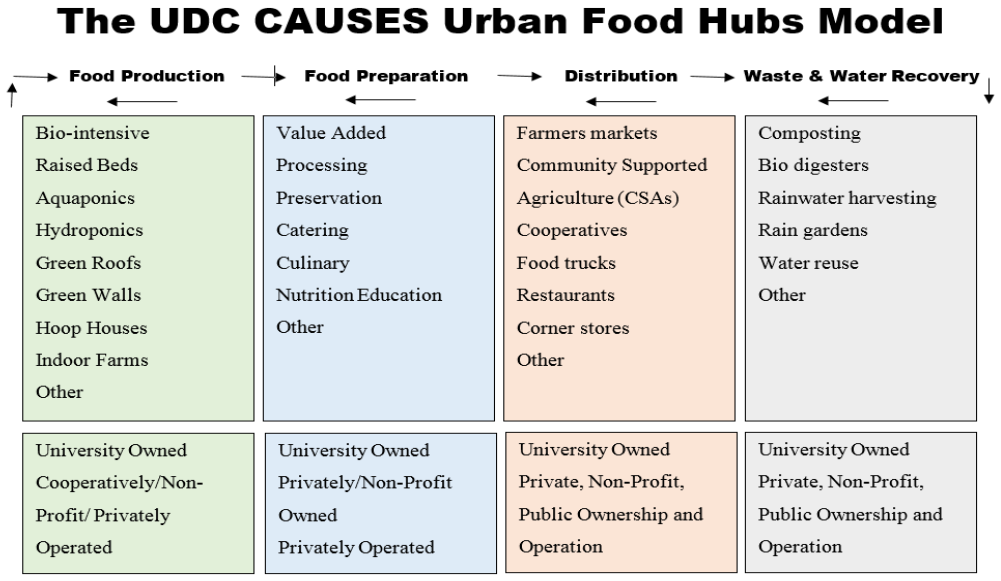

Figure 2. The Urban Food Hubs as Comprehensive Food Systems Model. Each Urban Food Hub features the four components of food production, food preparation, food distribution, and waste

and water recovery. Yet each specific design varies based on the urban density, site-specific characteristics, and business objectives of each location. What follows is a brief description of the four components of the UDC Urban Food Hubs that are currently in various stages of implementation in Wards 3, 5, 7, and 8 in Washington D.C.

Food Production Through Intensive Urban Agriculture

At the heart of each Urban Food Hub are highly efficient food production systems that utilize bio-intensive raised bed gardens, green roofs, hydroponic, and aquaponic to grow plants without soil in nutrient rich water. Regardless of the specific food production method a food hub utilizes, the aim is to maximize production on the limited land areas available in urban neighborhoods. The UDC Urban Food Hubs demonstrate several of these methods.

The University's Van Ness campus is located in Ward 3 at a high traffic intersection next to a metro station. Space is very limited in this high-density neighborhood. The food production component of the food hub is a 20,000-square-foot green roof that was installed on an existing roof structure (see Figure 3).

Figure 3. Food-Producing Green Roof of the UDC Van Ness Campus Urban Food Hub in Ward 3. Eighteen-inch deep planters placed around the perimeter of the roof support the production of a variety of food plants, from tomatoes to peppers, beans, okra, eggplant, and even berry bushes. The interior of the roof is limited to no more than four inches of soil depth, which can support the production of leaf lettuce, microgreens, and herbs. In its start-up phase the shallow beds are used mostly to grow sedums, a plant that is native to the area and requires little maintenance. The sedums absorb water and climatize the building, reducing storm water runoff and lowering heating and air conditioning needs (Horowitz, 2012; Whittinghill & Bradley Rowe, 2012).

The roof also features a greenhouse and a hydroponic system that is arranged vertically to fully utilize the limited space. Hydroponics refers to a method of growing plants in nutrient enriched water rather than soil. Nutrient levels are maintained by adding liquid fertilizer. Hydroponic systems produce substantial amounts of food in small spaces, including indoors, and can be used to grow herbs, lettuce, spinach, kale, and other greens, as well as tomatoes, peppers, cucumbers, beans, okra and squash. Since no soil is needed, hydroponic production can be used even in areas where soil contamination may be an issue. The Van Ness Food Hub also incorporates an aquaponics system that combines growing fish (aquaculture) and growing vegetables without

soil (hydroponics). The co-production of vegetables and fish creates significant water savings, high productivity levels, and reduced waste. The CAUSES aquaponic systems use only 10% of the water used in conventional agriculture and since the fish waste is used as plant fertilizer, very little waste is generated.

The University's Bertie Backus and PR Harris campuses are located in neighborhoods with lower urban density. Food production at both locations takes place in 30 foot x 85 foot hoop houses. The Bertie Backus location (see Figure 4) in Ward 5 is easily accessible by Metro and features three hoop houses, one with a hydroponic system, one with an aquaponic system, and one with a native plant nursery. The PR Harris location in Ward 8 features two large hoop houses with a hydroponic and an aquaponic system (see Figure 5).

Figure 4. The UDC Urban Food Hub at Betrie Backus in Ward 5.

Figure 5. The UDC Urban Food Hub at PR Harris in Ward 8. The East Capitol Urban Farm is the UDC Urban Food Hub location in Ward 7 (see Figure 6). It features a community garden with 60 raised beds available to residents, a children's garden and play area, a nature trail, and an aquaponic system installed in a 30 foot x 85 foot hoop house. The D.C. housing authority made the three-acre site available to UDC for the purposes of developing a model for temporary urban farming that improves the condition of vacant land while future development decisions are being made.

The hydroponic and aquaponic systems pioneered by CAUSES are highly energy efficient and stable. An aeration device called the Flo-Vex, which is the patented invention of a UDC emeritus professor, is the key to efficiency (Kakovitch Industries, 2016). Another innovation is that all

necessary components of the hydroponic and aquaponic systems are assembled on a metal skid for easy installation and maintenance (see Figure 7). Since experience with food production is limited in urban communities, the ease of installation and maintenance is an important consideration.

Figure 6. The East Capitol Urban Farm Food Hub in Ward 7

Figure 7. The Urban Aquaponic System at the UDC Urban Food Hubs in Wards 5, 7, and 8.
An important part of the UDC capacity building mission, are training certificates, workshops, and demonstrations offered at the Urban Food Hubs and at the UDC Firebird Farm. Topics include introduction to urban agriculture, bio-intensive growing methods, hydroponic and aquaponic production, and integrative pest management; but also food safety, age appropriate nutrition, food preservation, composting, and rain garden design and maintenance.

Food Preparation in Kitchens and Food Trucks

Two main thrusts of activities comprise the food preparation component of the Urban Food Hubs–nutrition education and value added. To address them effectively each Urban Food Hub ideally has a well-equipped kitchen that serves as a teaching facility to improve information about healthy eating, healthy food preparation, and age-appropriate diets. The kitchens also serve as a business incubator for those interested in starting a catering business or turning tomatoes and peppers into salsa or other value-added products. The kitchens are designed to be functional and

food safety compliant. Demonstration areas provide visible workspaces, and well-defined workstations for receiving, storing, preparing, preserving, and recycling.

Figure 8 shows the kitchen facility at the Van Ness Food Hub. Activities at the kitchens include nutrition education workshops, cooking classes, and food demonstrations. Certifications are offered in food handling, food safety, and food preservation like canning and pickling. The space can also be used to advance research on the determinants of safe food handling behaviors, risk perception, and cultural barriers that may impede the adoption of food safety and healthy eating habits.

Figure 8. Van Ness Food Hub Kitchen and UDC Food Truck at East Capitol Urban Farm.
Residents can also lease kitchen space to launch a catering or food-processing business. Nutrition education itself may also offer viable business opportunities. Recent legislative changes allow dieticians to prescribe a therapeutic diet. This is consistent with the increased focus on prevention, rather than treatment, which offers new opportunities to qualified dieticians and nutrition educators (Schaeffer, 2014; Anderson, Palombo, & Earl, 1998).

Kitchens are expensive to build and operate. A more affordable option is a food truck that can serve as a mobile food demonstration and teaching facility in addition to serving as a mobile farmers market that takes fresh produce to food desert neighborhoods. The commercial kitchen at the UDC Firebird Farm is installed in a standardized container. This may be a viable option for some urban neighborhoods provided zoning regulations permit the installation of a container. CAUSES also partners with schools, churches, community centers, and non-profit organizations to ensure access to suitable kitchen facilities that are easily accessible to residents. To be successful, nutrition and food safety education must be culturally sensitive and aware of the social pressures associated with food preparation traditions and eating habits. One approach to improving nutritional health developed by a UDC nutrition and dietetics professor is to modify family recipes and culturally significant dishes to improve nutritional value without changing the taste (forthcoming). Another approach is to provide self-monitoring devices that offer feedback to improve awareness of food preparation and eating habits.

Much work remains to identify successful strategies to prepare food for improved public health and economic conditions. Food is not only about nutrition, but it is also an expression of cultural identity and ethnic pride. This makes the food preparation component of the Urban Food Hubs

all the more important for the diverse urban neighborhoods they serve.

Food Distribution and the Price Point Challenge

A frequently-posed question is whether urban agriculture is commercially viable? The answer is, it depends. Growing demand for locally grown food and seasonal produce offers significant revenue potential (Pinchot, 2014). Yet high-revenue markets do not address the needs of urban food desert neighborhoods. These neighborhoods may not have the purchasing power to generate the revenue needed to cover the capital investment and operating expenses of an aquaponic or hydroponic system. To serve a low income local market may require a commitment to a socially responsible business model where a portion of the revenue generated from sales to high-end customers subsidizes lower revenue markets, or where some space is set aside as community space to supplement household incomes (Friedman, 2007; Golden, 2013; Philander & Karriem, 2016).

One of the most lucrative food distribution models is contracting with high-end restaurants for micro-greens, edible flowers, lettuce mixes, and herbs. Micro-greens take less than two weeks from germination to harvest in a hydroponic greenhouse. If the greens are seeded every day, it is possible to establish a pattern of daily harvests. Greens sold to local restaurants require minimal packaging and labeling, whereas sales to grocery stores will require more extensive packaging and labeling that creates higher costs.

Ethnic crops offer another high-revenue market. The term refers to plants that are not native to the Americas. Given the diversity of restaurants and food traditions in metropolitan areas, ethnic crop niche markets offer unique opportunities for urban growers. Food tastings conducted by CAUSES indicate significant market opportunities in Washington D.C. especially for African crops. Particularly popular are garden eggs, kittely, hibiscus, and hot peppers (Afanchao, 2015).

Local farmers markets and Community Supported Agriculture (CSA) programs that sell directly to the end consumer are also popular distribution options. CSAs deliver fresh produce, typically once a week, to a central pickup location or directly to CSA member homes. Rather than charging a price per pound, CSAs charge customers a flat fee at the beginning of the growing season. In exchange, CSA members receive a weekly delivery of in-season produce. Some CSAs offer a lower price to customers willing to assist with crop maintenance, harvesting, and delivery (O'Hara & Stagl, 2002). CSAs typically require minimal packaging. Produce is delivered in bags or boxes and CSA members exchange the empty container for a full one at the time of delivery. UDC operates a farmers market at the East Capitol Urban Farm and a farmers market and CSA at the Van Ness Food Hub. Other markets are expected to open during the 2017 growing season.

Generating sufficient revenue from sales to the end consumer can be challenging especially in low-income neighborhoods that are most in need of fresh food. The D.C. Produce Plus program (http://doh.dc.gov/service/produce-plus-program) expands the purchasing power of low-income neighborhoods. The program doubles the value of food stamps and Women, Infants, and Children (WIC) coupons if they are redeemed at a local farmers market. The Veggie Prescription program offers similar benefits. It works with local hospitals and community health centers to encourage health providers to offer prescriptions of fresh fruits and vegetables instead of medication. The veggie prescriptions are then redeemed at a local farmers market (Brody 2014).

The Urban Food Hubs also support collaborative efforts including gleaning days and harvest collections. One such initiative, the City Orchard project, established a fruit orchard at the UDC Firebird Farm to grow a variety of berries, apples, and Asian pears for clients of a local food bank. The food bank, in turn, helps maintain the orchard through weekly volunteer days, which have the added benefit of introducing food bank clients to a farm often for the first time. Collaborations with local schools, culinary institutes, and other hospitality sector partners also expand food distribution options. For example, a local green roof business estimates that 50% of its revenue comes not from food production but from catering and health and wellness events.

Food distribution-related programs offered by CAUSES include entrepreneurship classes, market research to assess opportunities in the food and hospitality sector, and research on the delivery preferences of various demographics. The skills associated with fish and produce production, and with the value-added from food processing and preservation, are only of benefit if they find markets that generate revenue and living wages.

Closing the Loop through Waste and Water Recovery

Waste and water management are essential components of the UDC Urban Food Hubs. Given the land-use pressure in growing metropolitan areas like Washington D.C., this component can add valuable positive externalities that add to the economic bottom line of food production and value-added food preparation. For example, food and horticulture plants that are growing on green roofs, in community gardens, and in rain gardens absorb water and urban farms add permeable surfaces to the urban scape. This can meaningfully reduce storm water runoff and reduce the pressure on storm-water systems that are often outdated and well below current capacity needs. Urban agriculture can therefore mitigate flooding risks and improve urban resiliency. The term resilience refers to the ability of communities to cope with disruptive events like natural disasters and to recover more quickly from the negative impacts of a disaster (Meerow, Newell, & Stults, 2016; Prior & Roth, 2013; Wheater & Evans, 2009).

Vegetable plants have relatively high nutrient needs. It may therefore be necessary to capture the water runoff from urban agriculture systems and reduce water-soluble nutrients before the water run-off is released into the storm water system (Niemczynowicz, 1999). The Van Ness Food Hub captures the water runoff from the food-producing green roof and stores it in cisterns for reuse in irrigation systems that maintain plantings around the center of the campus (see Figure 9). This kind of water management adds value that is not captured in the revenue generated by food products. A number of cities also offer storm water credits to incentivize water capture and reuse (Friedrich, 2016).

Water Capture at the Van Ness Food Hub and Soil Mitigation at East Capitol Urban Farm. The design, installation, and maintenance of rain gardens and green roofs offers viable business opportunities and improves the aesthetics of the urban scape. A particularly innovative rain garden is a rice paddy that was installed at the East Capitol Urban Farm (see Figure 10). The small rice field grows organic rice in a flood-prone area. This generates dual benefits from storm water management and sustainable rice production. In addition, the innovative rain garden adds to the aesthetics of the site.

The design, installation, and maintenance of rain gardens and green roofs offers viable business opportunities and improves the aesthetics of the urban scape. A particularly innovative rain garden is a rice paddy that was installed at the East Capitol Urban Farm (see Figure 10). The small rice field grows organic rice in a flood-prone area. This generates dual benefits from storm water management and sustainable rice production. In addition, the innovative rain garden adds to the aesthetics of the site.

Figure 9. Water Capture at the Van Ness Food Hub and Soil Mitigation at East Capitol Urban Farm.

Figure 10. The Rain Garden Rice Paddy at East Capitol Urban Farm and Compost for Soil Mitigation. Urban soils are often contaminated and may require soil amendments before they are suitable for food production. Composting is key and each of the urban food hubs has a small composting site where plant and food waste can be turned into healthy soil. A recent business start-up in the D.C. area is Compost Taxi. For a monthly fee, Compost Taxi picks up food waste from residential households and composts it to support urban agriculture initiatives.

The social benefits of green-infrastructure improvements also go beyond soil and water management benefits. Adding green space to health facilities, for example, improved the performance of medical staff and the healing and recovery process of patients (Guenther & Vittori, 2013). Other social benefits include improved neighborhood safety, better walkability, more exercise, and added public space where neighbors can socialize (Ackerman et al., 2014; Chiffoleau, Millet-Amrani & Canard, 2016; Daiggaer, 2009; Dixon et al., 2007; Gallet, 2011) As the Urban Food Hubs continue to evolve, each hub may eventually be equipped with an alternative energy source that takes the Urban Food Hubs off the grid and turns them into

resiliency hubs that can secure food, water, and energy during times of crisis. This resilience model is already under development at the UDC Firebird Farm. It features a solar-powered groundwater well, a containerized aquaponic system and kitchen, and a solar powered walk-in refrigerator.

The Urban Food Hubs also enhance the learning opportunities of UDC students. They serve as a common focal point for service learning, student and faculty research, leadership development, and professional networking. Students can enroll in the certificate courses and workshops offered through the University's land-grant programs to prepare them for success as entrepreneurs in the local food and green infrastructure economy.

Investing in Urban Capacity Building

Metropolitan universities have long been at the forefront of investing in surrounding communities. Capacity building investments include renovation and reuse of residential properties, business incubators, neighborhood storefronts, and more. Frequently these initiatives put un- and under-utilized buildings back in use as resident halls, offices, classrooms, and businesses (Drucker & Goldstein, 2007; O'Hara, 2001; Rucinski, 2001).

The UDC Urban Food Hubs expand this capacity building role to include university-owned food production, food processing, and green infrastructure facilities. Similar to a business incubator that makes space, equipment, and shared services available to business start-ups, the Urban Food Hubs make an upfront investment in the urban food and green infrastructure sector (Saegert, 2006). This improves the likelihood of success for start-up businesses that would find it difficult to make the capital investment necessary to install a hydroponic or aquaponic system, a green roof, or a commercial kitchen.

Even less capital-intensive production methods that utilize raised bed gardens may require considerable up front investments. When land that was previously used as a building site, is converted to agricultural land, the up-front soil remediation and site preparation costs can be substantial. The Urban Agriculture toolkit published by the USDA tallies the projected investment at $100,000 to $250,000 for a half-acre parcel of land (USDA, 2016). The kitchen facilities associated with the food preparation component of the Urban Food Hubs can be even more costly unless a pre-existing kitchen facility is available for use or renovation.

The UDC Urban Food Hubs initiative has begun to make the necessary investments to turn food desert neighborhoods into thriving neighborhoods. A pilot project to test the University's entrepreneurship based model was launched at the UDC Firebird Farm where a group of students built and managed a hydroponic system installed in a 30-foot x 60-foot hoop house. The students successfully produced head lettuce and basil for sale at local farmers markets and the model is now being transferred to the UDC Urban Food Hubs. The Hubs currently under development feature four hydroponic and four aquaponic facilities, two commercial kitchens, and a food truck. Funding for the Urban Food Hubs comes from a sustainable development grant of the District of Columbia, from the Anacostia Economic Development Corporation, and from the University's own capital funds. In the tradition of land-grant universities, the UDC College of Agriculture Urban Sustainability and Environmental Sciences (CAUSES) provides training and technical assistance for the development, implementation, and operation of the businesses launched at the

Urban Food Hubs. The hubs thus offer a model for business development from the ground up that identifies local entrepreneurs who wish to utilize the business opportunities the hubs offer. Prospective entrepreneurs can use an on-line application process to apply for the use of the facilities. A review panel interviews applicants to select the most promising entrepreneurs. Since the new business start-ups will have to carry only operating expenses, their financial viability and future expansion potential should be improved. By investing in the Urban Food Hubs, UDC expects to improve the success rate of the urban businesses it incubates.

The model has also proven to offer additional business development opportunities in the technology sector. A UDC computer science professor and an emeritus professor are collaborating to develop a sensor system that optimizes the productivity of the aquaponic and hydroponic facilities through a National Science Foundation Small Business Technology Transfer (STTR) grant (Clearton, 2017). The STTR program provides funds for small businesses to conduct research and development (R&D) on technology innovations that have the potential to be commercially successful and benefit society. Early indications suggest the Urban Food Hubs can galvanize neighborhood activity and provide social and environmental benefits that go beyond the core objectives of spurring economic development and improving health outcomes. The following section highlights the social and environmental benefits of the food hubs.

Assessing Broader Social and Environmental Impacts

The UDC Urban Food Hubs offer a model to diversify and localize the food and green infrastructure economy of metropolitan communities. While the economic viability of the Urban Food Hubs will depend on the specific business model and site characteristics of each hub, the social benefits of improved health outcomes of underserved urban populations are indisputable. Seeing how food is grown can be an effective catalyst for adopting more healthful eating habits and for reducing the public health expenditures associated with food-related illness. Michigan State University's Cooperative Extension Service identified seven benefits of locally grown food that are not captured in the food price. Locally grown food is: (a) more flavorful; (b) reconnects us with the seasons; (c) is more nutrient dense; (d) supports the local economy; (e) benefits the environment; (f) promotes a safer food supply; and (g) connects consumers and growers which improves awareness of where food comes from (Halweil, 2002; Klavinski, 2013). A report published by the University of California Davis (2015), also attributes considerable social, health, and economic impacts to urban agriculture, and an MIT study documents the economic impact of urban aquaponics (Goodman, 2011). The field of ecological economics offers especially useful examples for calculating the value of the social and environmental side benefits of economic activity (O'Hara, 1996; 2004; 2014). The USDA Regional Food Hub Resource Guide also illustrates economic, social, and environmental impacts (Barham et al., 2012).

Some of the benefits of locally grown food will depend on the specific production methods applied. Some growers, for example, may be committed to growing seasonal food plants while others will grow the same salad mix year around. Environmental benefits may vary with the energy used for food production. Almost regardless of the specific production methods, the Urban Food Hubs reduce water use and improve storm water management. Many cities have an aging water infrastructure that is at capacity and will benefit from the reduced water runoff associated with the Urban Food Hubs. The benefits of reduced transportation and improved freshness also apply across the board, regardless of the specific production method used. The

urban food hubs can also improve the aesthetics of a neighborhood. Raised bed gardens, trellises, and vertical growing systems can bring tremendous enhancements to an urban neighborhood. Other benefits may result from the reuse of unused or underutilized buildings that can be successfully repurposed for indoor food production.

Much has been written about how to measure the quality of life of urban communities and the complex economic, social, and environmental impacts of sustainable development strategies (Agudelo-Vera et al., 2011; Birch & Wachter, 2008; Burton, 2009; Costanza et al., 2007; Marans & Kweon, 2011; Paul, Magee, Scerri, & Steger, 2015; Sirgy & Cornwell, 2002; Smit, Nasar, & Ratta, 1996; Vollmer, 2011; Wheeler & Beatley, 2014). A practical approach that brings the social and environmental impacts of economic development into view is the Five Pillars of Economic Development model pioneered by the author (Kakovitch & O'Hara, 2014; O'Hara & Vazques, 2006). This model argues that the key to long-term economic success lies in focusing on the needs and assets of local communities. This requires closer attention to those factors that undergird successful economic development rather than to economic indicators themselves. While economic indicators like the numbers of jobs or GDP per capita provide a snapshot of the impact of past actions, the Five Pillars focus on future economic development potential. By tracking those factors that are commonly considered external to the purview of economics, communities can be more pro-active in their development decisions. The Five Pillar categories that capture long-term economic success are: (a) health; (b) education; (c) environmental quality; (d) social and cultural amenities; and (e) access to information and transportation (see Figure 11). Table 2 offers a sample of indicators that can capture trends in the Five Pillar areas. Tracking the impact of the Urban Food Hubs on these indicators provides a measure of the long-term economic development impact of the hubs.

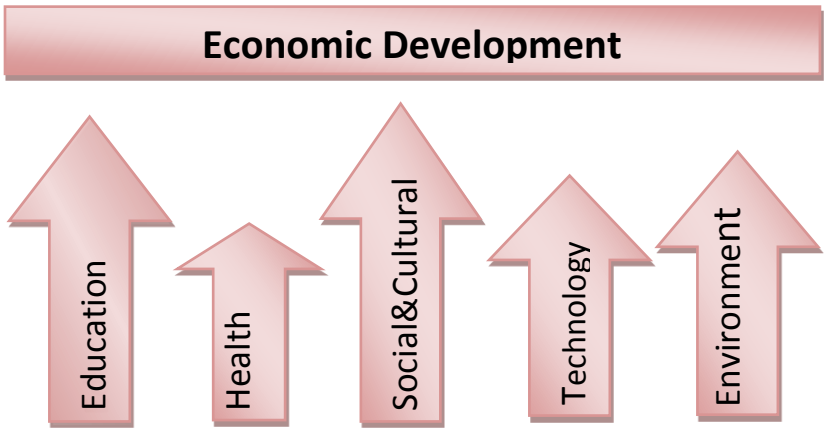

Figure 11. The Five Pillars of Economic Development. Economic development strategies that focus on the Five Pillars depend on local information and local knowledge. The knowledge of credentialed experts that uses aggregated data and often assumes that solutions are transferrable from one community to another may be useful, but not sufficient. Such aggregated information can create distortions that underestimate local purchasing power and other local assets. What is needed instead is the knowledge of local experts who can give voice to local context conditions, development barriers, and assets. Such local knowledge is typically sparse, yet it is the very basis for identifying viable markets and resources that are often overlooked.

University decision makers must look beyond the usual circle of stakeholders and outside their comfort zone to ensure research agendas and capacity building agendas are shaped by a commitment to bring the life worlds (translated from Habermas term Lebenswelt; Habermas, Habermas, & McCarth y,1985) of local communities and non-credentialed local experts into focus. Without the engagement of local experts, local contexts will be misrepresented, underrepresented, or omitted altogether (O'Hara, 1996; Raja & Diao, 2016; Hacker et al., 2012). A Five Pillars study for Washington D.C. is currently under way and will be released in 2017.

Table 2

Selected Indicators of the Five Pillars of Economic Development

Indicator Category
Education
● % of population with one or more year of college ● Public high school graduation rate ● Student:teacher ratio in public schools ● Achievement test scores (ACT/SAT) of high school seniors
Health
● Life expectancy ● # of physicians per 1,000 of the population ● % of population that is obese ● % of population with diabetes
Social & Cultural Amenities
● # of full service grocery stores per 100 of population ● # of health food stores ● # of sit-down restaurants ● % participation of residents over 18 in clubs and organizations
Information Technology and Transportation
● % of households with internet access ● # of high speed internet access providers ● # of people per day using public transportation ● # of commuters with 25 minutes or less commuting time
Environment
● Dissolved oxygen in surface water ● Acres of permeable surface area ● Green cover from agriculture, horticulture, grassland ● # of days with heat index above 100^{o}F

Metropolitan universities are ideally positioned to take on the role of facilitating a local and regional discourse about pathways to long-term sustainable development. This may take the form of stakeholder meetings, listening sessions, neighborhood meetings, and other forms of dialogue with a broad range of individuals and organizations that offer a perspective on local needs, assets, opportunities, and deficits. The Urban Food Hubs stand in the tradition of the Cooperative

Extension Service of United States land-grant universities and offer a space for formal and informal discourse applied to a metropolitan context.

Conclusion

The Urban Food Hubs of the College of Agriculture, Urban Sustainability, and Environmental Sciences (CAUSES) of the University of the District of Columbia (UDC) offer a model for capacity building that is committed to creating a local economy that improves the economic, social, and environmental conditions of underserved urban communities. The Urban Food Hubs are designed to improve access to fresh food, reduce health deficits, and create jobs. Each food hub consists of four components that link economic, social, and environmental impacts.

The four components offer four distinct types of business development through high intensity food production on green roofs, raised bed gardens, and hydroponic and aquaponic facilities; food preparation that adds value to locally grown food and improves public health; innovative food distribution models that improve access to high quality affordable food through farmers markets, food trucks, and CSAs; and waste and water management through composting, reduced storm water run-off, and green infrastructure improvements.

The metropolitan area of Washington D.C. is growing. The Urban Food Hubs must therefore be competitive in an environment of intense land use pressure. Counting external benefits in addition to core mission of improving food security and creating jobs is therefore of paramount importance. Some more tangible benefits include reduced food-related illnesses and improved storm water management. Some less tangible ones include improved neighborhood aesthetics, stronger civic engagement and neighborhood safety. By making an upfront investment in the Urban Food Hubs, the UDC is creating the capacity for improved food access, health, and economic development in underserved neighborhoods in the nation's capital.

Beyond applicability for Washington D.C., the Urban Food Hubs can serve as a model to improve the quality of life and economic opportunity of urban communities across the nation. The Urban Food Hubs thus have a larger agenda: to create a network of sustainable and resilient local food systems that advance the economic, social/cultural, and environmental/physical benefits. The long-term sustainable development success of metropolitan communities depends on developing such resilient local economies. As urbanization continues globally, food and water security cannot be addressed without solutions that include urban communities and reimagine them as hubs for a comprehensive, sustainable food system close to where the majority of consumers live-in metropolitan communities.

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Collective Approach to Complex Food System Issues, the Case of The Ohio State University

Julie Fox

Abstract

Urban universities are uniquely positioned to make powerful and lasting contributions to the grand challenge of food security. To better understand the various dimensions related to the university's role in food systems, this case study explores intentional linkages, significant developments, natural tensions, and emerging impacts at the Ohio State University. Discoveries from this analysis can guide urban university decision makers as they confront complex food system challenges.

Keywords
Food security, Sustainability, Engaged scholarship, University stewardship

Introduction

Urban university leaders are positioned to inspire and invest in collaborative solutions to emerging food system challenges. Food fulfills nutritional needs, but it also embodies social, cultural, economic, political, and environmental significance (Mcgirr & Batterbury, 2016). Food system issues, such as production, supply, marketing, distribution, access, health, consumption, and disposal of wastes, span the contexts of local and global; rural and urban; conventional and alternative (Koc, 1999; Lang & Heasman, 2015; Pothukuchi & Kaufman, 1999).

Food systems are a priority of the Ohio State University (OSU). As one of America's largest and most comprehensive urban universities, OSU's annual budget supports six campuses across the state, Extension offices in all 88 counties, international collaborations, 18 colleges and schools, more than 33,000 employees, and 65,000 students. The university's collective attention on food extends through all levels of the institution. This includes the board of trustees and university senate, down to faculty, staff, students, alumni, donors, volunteers, and other community members. Their conjoint efforts involve them in (a) food system teaching and learning; (b) research and innovation; (c) outreach and engagement; and (d) resource stewardship (see Figure 1).

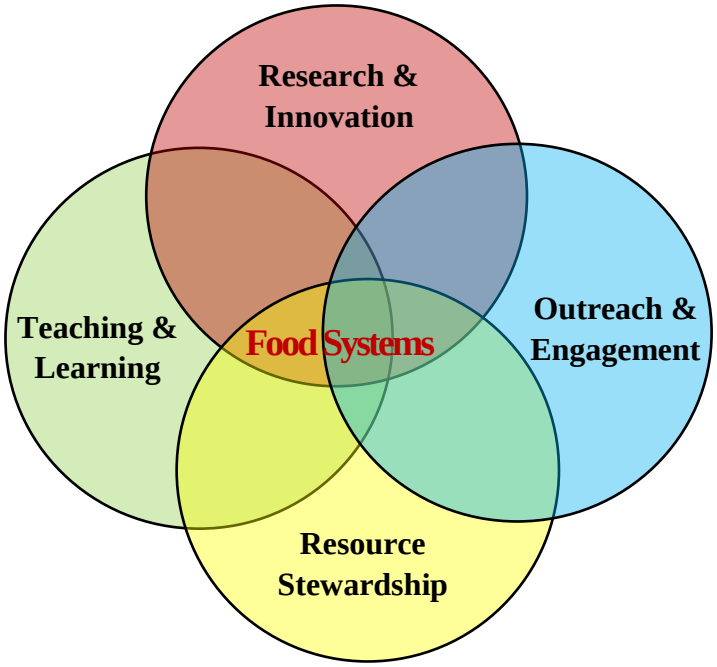

Figure 1. OSU's collective approach to food systems aligns with the University's mission. Navigating through the many aspects related to food systems with a university this size requires tremendous collaboration. As one of seven focal points, the OSU food initiative directly involves academic units, dining services, advancement, and multiple centers and research institutes. Individually, these resources make direct impact. Collectively, they address the most pressing needs, such as sustainable food systems. Despite many independent and collaborative hunger-fighting efforts and an Ohio agricultural industry worth $100 billion, food security remains a significant issue in the state. Food security is a condition in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance, social justice, and democratic decision-making (Hamm & Bellows, 2003). Over the next decade, OSU plans to invest nearly $125 million in food security, combatting this critical challenge from all disciplinary fronts as an integral element of OSU President Drake's 2020 Vision for the university. "We can solve critical issues of our time," stated Drake. "Our collective efforts can and will transform lives." During the timeframe of this study, food security and food systems have moved from key topics integrated into many projects to primary drivers of unified strategic initiatives. "Wicked problems" such as food security, require a more collaborative, integrative, transparent, and inclusive model (Fauvel & Lake, 2015).

Many urban universities focus on multiple food system factors. For example, Pothukuchi and Molnar (2015) examined sustainable food systems at urban public universities, with a summary of curriculum, food gardens, farmers markets, dining services, and other indicators. Barlett (2011) compared small, medium, and large university campus sustainable food projects as demonstrated through food purchasing goals, academic programs, direct marketing, and experiential learning. Relevant literature reviews concentrate on food system components, such

as urban agriculture impacts (Golden, 2013). Additional studies have been published in university reports and diverse journals centered on agriculture, social science, planning, policy, economic, and geography. This study (a) draws upon previous approaches; (b) expands to include elements such as advancement, cluster hires, and the role of university governance; and (c) examines mission-driven strategic investments related to teaching, research, engagement, and stewardship. The intent was to better understand the strategic shift of urban universities to a more collective approach to complex food system issues.

Methods

Case studies allow researchers to investigate contemporary complex phenomenon within real-life context (Creswell, 2013; Yin, 2011) and is often used in organizational research (Hartley 1994). The case study described here explores how OSU approached food system interests that contributed to the university's vision as a model of a 21st century public, land grant, research, urban, and community engaged institution. To understand this case in its distinctiveness, the researcher's approach was interpretive and analytical, rather than solely descriptive (Merriam, 1988; Stake, 1995). This approach was selected to illuminate contextual aspects of the situation to gather both agreed upon and diverse views (Lauckner, Paterson, & Krupa, 2012). Sources of data were collected through examination of the literature, document reviews, and observations during the five-year period of 2012-16. Search indexes included ProQuest, EBSCO Host, Web of Science, and Google Scholar. Nested Boolean searches included "urban university and food systems" and "university food system teaching, research, engagement, or stewardship." The researcher used the internet archive, the Wayback Machine to investigate historical website content (Hackett & Parmanto, 2005; Murphy, Hashim, & O'Connor; 2007; Thelwall & Wilkinson, 2003). Documents were evaluated and organized based on contributions in one or more components of teaching and learning; research and innovation; outreach and engagement; and resource stewardship. Because the intention was not to isolate these perspectives, the researcher also noted the relationships connecting them. Limitations of the study could be addressed through future research using multiple methods and a longer period to study of OSU's six campuses, 15 colleges, 105 departments, and more than 220 centers and institutes.

Food System Teaching and Learning

A focus on food systems is integrated into teaching and learning across multiple disciplines through a variety of degree programs, courses, studio assignments, capstone projects, internships, education abroad experiences, special events, and other engaged learning options. Each college, school, and center brings distinct specialization. Increasingly, units are working collectively to advance learning through broader perspective. Unique aspects at OSU include a two-year Associate degree option at the Agriculture Technical Institute that can lead to undergraduate and graduate degrees at the university's five other locations, experiential learning on a 261-acre urban farm on the Columbus campus, and collaboration of multiple units to support a course aligned with the university's sustainability goals (see Table 1).

Table 1

OSU Examples of Food System Teaching and Student Learning

Unit	Experiential Learning
College of Food, Agricultural, and Environmental Sciences	Various food-related undergraduate and graduate degrees Agricultural Technical Institute, Associate of Science Agroecosystems Management Program, endowed by the W. K. Kellogg Foundation Waterman Farm (261 acre farm on prime campus real estate)
John Glenn College of Public Affairs	Course on food system planning and the economy Minor in food policy
Knowlton School of Architecture	2013 symposium and exhibition for planning and design for new urban food systems
College of Arts and Sciences	Translational plant sciences graduate program Department of Theater lab series that includes *Playing with your food*
The Center for Ethics and Values	University-wide COMPAS conversations that address issues such as what it will take to feed an urbanized, climate-challenged world
College of Social Work	"Follow the Tomato" service-learning course
Multiple Units	Capstone project on local food and sustainable food purchasing (in response to the university's sustainability goals developed by the President and Provost's Council on Sustainability in 2015, which includes a goal of increasing production and purchase of locally and sustainably sourced food to 40% by 2025) Food Fellows pilot program aimed to educate interdisciplinary students about issues related to food, such as urban agriculture, food policy, and food insecurity
International Studies and the Office of International Affairs	Multidisciplinary undergraduate courses such as food, population, and the environment; and food security and globalization. Education abroad experiences such as South Africa's sustainable agricultural system or European dairy science
Student Life Center	Thousands of students, faculty, staff, and community members learn about diverse food and culture through the annual Taste of OSU event hosted by international student organizations. Additional emerging opportunities include World Food Day, World Cities Day, and other United Nations activities during Urban October.
First Year Student Experience	Buckeye Book Community brings together 7,000 incoming freshman and members of the alumni association through an author visit and community building dialogue integrated into academic and co-curricular settings. In the 2015-16 academic year, the featured book was The Good Food Revolution.

Teaching and Learning with Off-campus Audiences

OSU fosters collaborations to advance food system understanding for all, not just undergraduate and graduate students. The university extends learning with off-campus audiences through continuing education, workforce development, Extension, public media, and a P12 initiative to connect OSU personnel and students with school-aged children and their families. OSU faculty are involved in the World Food Prize and Global Youth Institute, a program for high school student leaders engaged in the global fight against hunger. Through television, radio, a blog, events, and online resources for educators and students, WOSU Public Media informs and inspires people across the state (http://wosu.org).

Extension faculty and staff improve communities by helping others learn (McGrath, Conway, & Johnson, 2007). As an example in one community, food safety Extension education became an urgent priority after botulism killed one woman and hospitalized 24 others who had attended a church potluck. Extension also provides community nutrition education through a variety of curriculum for diverse audiences. To help Ohio citizens and community leaders learn about food systems, OSU Extension published "Healthy Food Systems," which is a guide to learn more about food production, food and business, food and health, and food and community.
Leaders are also learners. One of the many ways leadership for a 21st century food system is cultivated is through a national Food System Leadership Initiative (FSLI) program of the Association of Public and Land-Grant Universities (APLU) with support from the W. K. Kellogg Foundation (www.fsli.org). With OSU as a program partner and host for one of the three cohort sessions, university leaders focus on a holistic series of core leadership competencies of individual leadership; leading change within organizations; and understanding and influencing complex, diverse food systems.

Food System Research and Innovation

During the five-year period of this study, OSU continually ranked in the top 20 universities for total research expenditures (National Science Foundation) and research progressively developed through collaborative initiatives. With a total of $983 million in annual research and development expenditures and 80 research centers across 16,000 acres, it's a challenge to adequately distinguish the percentage invested specifically in faculty-led food system research. There has been increasing investments through transdisciplinary discovery themes; food and agricultural research centers; and other innovations for economic, environmental, and social food system issues.

Discovery Themes

OSU's transdisciplinary Discovery Themes were launched in 2012 with the intent of bringing the full capacity of the university to address the world's most pressing challenges. This provided an unprecedented opportunity for the university to come together to find durable solutions to long-term targets such as Food Production and Security. The other broad areas of health and wellness; and energy and environment, also closely align with food system interests. Discovery Themes are funded, in part, through parking-lease payments. More than 140 new researchers are being

hired in diverse fields, such as anthropology agriculture, architecture, nutrition, social work, public health, engineering, and economics. Faculty cluster or cohort hiring is an emerging practice as urban universities increasingly recognize interdisciplinary research and collaboration to address grand challenges facing society. OSU President Michael Drake, joined other Coalition of Urban Serving Universities presidents to share new research on faculty cluster hiring and a set of best practices to support the use of this strategy for improving faculty diversity and institutional climate.

Food and Agricultural Research Centers

A commitment to collaborative research has remained a core value at OSU, extending beyond formal initiatives such as the Discovery Themes. Food system research and innovation centers include:

- a vast network of agricultural experiment stations, some that have been around since 1887 as part of the Ohio Agricultural Research and Development Center (OARDC);
- the Food Industry Center, established in 1982 to improve food products and processes;
- the Center for Applied Plant Sciences, formed in 2012 to connect teams of investigators from many disciplines; and
- the Food Innovation Center (FIC), launched in 2010 to improve global quality of life by inspiring sustainable multi-disciplinary food solutions.

Teams launched by the FIC have involved 380 faculty members, staff, and graduate students with combined scholarly output that includes more than 60 peer-reviewed articles and more than 80 professional presentations. The initial $1.9 million dollar investment in faculty research has resulted in almost $9 million in extramural support. In 2013, the FIC funded an interdisciplinary team of researchers and community partners for a Mapping the Food Environment project to address the complex issues associated with food insecurity and health outcomes. In 2014, OSU's Center for Regional and Urban Analysis, the Local Food Council, the Kirwan Institute for the Study of Race and Ethnicity, and the John Glenn School of Public Affairs hosted a public listening session for individuals interested in working on mapping projects related to local food access. Many academic disciplines and community organizations use mapping to provide a visual representation of food systems, to explore the nuances of food environments, and to inform future research, including geography, planning, public policy, public health, human nutrition, and epidemiology (Sweeney et al., 2015).

The FIC also funds student innovations. For instance, Garden Express Meal Starters is a creation by students from food science and technology and human nutrition who shared an interest in combining good food science and social responsibility. They participated in the 2016 Food Fight competition sponsored by the Food Industry Center through an alliance with the Mid-Ohio Foodbank. Dehydrated underutilized vegetable medleys and spice packets create an appealing, affordable, long-lasting, nutritious sauce when combined with hot water. They are intended to be the base of a meal when paired with other foodbank products such as noodles, rice, meats, broths, or breads.

Innovation for Economic, Environmental, and Social Food System Issues

For the economic aspect of food systems, the OSU Food Industries Center provides technical and scientific services to companies. The Department of Food Science and Technology, links education, research, and product development in fully equipped pilot plants. OSU's Center for Advanced Functional Foods Research and Entrepreneurship (CAFFRE) fuses expertise from food scientists, medical professionals, and policy experts that have experience working with industry partners. With a focus on "Crops to the Clinic to the Consumer," multidisciplinary research teams develop and enhance the availability of functional foods that promote health. One such product was black raspberry confections that have been used in clinical trials and sold at the Café at OSU's James Cancer Hospital. CAFFRE is one of several OSU centers for research.

From the environmental perspective, innovative food production is not enough for a sustainable food system. Between 25% and 40% of food grown, processed, or transported is wasted in the United States each year (Gunders, 2012). An OSU professor of Agricultural Marketing and Policy led a Food Waste Collaborative team to help solve America's food waste problem. The Collaborative faculty are conducting research to identify patterns regarding how Americans form attitudes on food waste and developing FoodImage, an app to measure food waste from food photos.

Social issues are also critical. Through Community Research Partners (CRP), OSU partners with the City of Columbus, United Way of Central Ohio, and the Franklin County Commissioners, to strengthen communities. Projects focus on topics such as food insecurity among college students, and food and nutrition as CRP partners in the Urban Institute's National Neighborhood Indicators Partnership. Ohioans are frequently involved with OSU research. More than 100 citizen-scientists are helping with a pollinator study conducted by the Department of Entomology at Ohio Agricultural Research and Development Center (OARDC).

These are just a few examples of OSU investments in creating collaborative and focused approaches for faculty and staff leaders to influence food systems through research and innovation. Findings are shared with the public through various methods and media, including University Communications and The Conversation, which was launched in 2014 as a multi-institutional research reporting source. One example of an OSU faculty member sharing their knowledge with the public through The Conversation was a 2016 food security article authored by professors of anthropology and economics. Similar to other urban universities, OSU's food system research spans multiple disciplines and engages students, faculty, and industry. Unique aspects at OSU include the substantial investment in transdisciplinary team science and significant influence from the arts and vast medical center perspectives.

Food System Outreach and Engagement

Community-university partnerships have taken many forms and have been recognized as a valuable contribution to both the academic community and cities (Kotval, 2003). Establishing connections between university and community representatives enables research to contribute to social change in food systems work (Nelson & Dodd, 2016; Rojas, Sipos, & Valley, 2012; Tanaka & Mooney, 2010). At OSU, an ever-emerging network of diverse partners involves faculty, staff, and students; local citizens and neighborhood groups; schools and libraries; public officials and agencies; private business and industry; non-profit organizations; and

philanthropists. Engagement with these diverse collaborators has helped inform and shape OSU's food system teaching, research, and stewardship. In 2016, the Association of Public and Land-grant Universities (APLU) released a framework for the New Engagement, specifically recognizing unique dynamics for universities situated in large metropolitan areas. For urban universities, diversity in the community and on campus presents a unique context. With the size and scope of the university and the city, engagement can sometimes be daunting. Engaging diverse stakeholders is not always easy, especially when addressing the many issues surrounding food. Food system definitions and expectations vary based of the perspective of academic disciplines, the focus of government agencies, the mission of non-profit organizations, industry agendas, geographic scope, grassroots citizen priorities, and cultural influence. Competing interests and tensions are common within various aspects of the food system (Campbell, 2004; Levkoe, et al., 2016).

OSU has a long history of outreach and engagement (Bromley & Kent, 2006). Working collaboratively is an increasing focus through OSU's Office of Outreach and Engagement, the university's extensive statewide Extension network, and a College Engagement Council that connects college deans from all OSU campuses. Engagement is cultivated through individual food system projects, interdisciplinary centers, and at university-wide events. OSU earned the Carnegie Foundation for the Advancement of Teaching's 2015 Community Engagement Classification, acknowledging the university's extensive engagement and recognizing OSU's mission, culture, curriculum and resources are structured to support high-impact community engagement.

An example of extensive community engagement was the 2016 Buckeye Summit that convened approximately 600 members of "Buckeye Nation" to address food security. Additional local events involved some of OSU's 530,000 alumni members, corporate partner personnel, and other members of the community. Other engagement efforts include Campus Partners for Community Urban Redevelopment, an interdisciplinary center established by OSU in cooperation with the City of Columbus to spearhead the revitalization of the University District. Specific projects also engage the local community. For example, in 2013-14, multiple OSU units joined citizens and community groups to explore how food could be a catalyst for urban neighborhood development. Ongoing engagement opportunities can be found through volunteer.osu.edu, where community members, fans, and friends, alumni, and faculty can get involved with OSU through a wide variety of commitments. Food touches everything and is a foundation of an endlessly evolving enactment of individual and community relationships (Counihan & Van Esterik, 2013).

Student Engagement

Student engagement in higher education is a complex construct influencing the student experience and student success (Kahu, 2013). Students get involved with the community through internships, service learning, and other activities. A food system example is the Buckeye Food Alliance food pantry, established by roommates and friends to improve food security on campus. OSU students interested in social transformation can apply for the OSU President's Prize, which provides two graduating seniors with vital connections and financial support to advance innovative ideas for change in their first year after graduation. One of the OSU students who won a 2016 President's Prize received $100,000 to create an Ohio State community garden to

provide produce to local food insecure families. Another example of OSU student engagement is Pay It Forward, an OSU student cohort to help students become lifelong, civically-engaged citizens.

Faculty Engagement

Faculty connections to food systems extend beyond classrooms, laboratories, and formal channels of engaged scholarship. Faculty engage in food system activities, from direct community service to participating in community dialogue involving diverse, and sometimes competing values. The John Glenn College of Public Affairs fosters networking for the representatives of Ohio's food policy councils. In 2013, OSU professors served as panelists for a public conversation on food, farming, and the social, economic, environmental, and emotional aspects of biotechnology (GMOs) and sustainability. In 2014, faculty with OSU's Center for the Study of Religion joined others in a presentation series, "Everybody Eats: Exploring Food, Flavors, and Faith." As faculty participate in on- and off-campus activities, it's essential for them to understand academic freedom and responsibility that differentiate between official activities as faculty and personal activities as citizens.

OSU Extension

With offices in all of Ohio's 88 counties, Extension connects with urban universities throughout the state and across the nation. Wide-spread interest in food and farming creates an opportunity for Extension to provide leadership and expertise (Sharp, Clark, Davis, & Bean Smith, 2011). For example, OSU Extension in Cuyahoga County is a co-convener of the Cleveland-Cuyahoga County Food Policy Coalition. Nationally, Extension professionals, working on community food systems, have collaborated through the eXtension Community of Practice (https://extension.org), Joint Council of Extension Professionals, and Healthy Food Systems, Healthy People, a collaboration of the Association of Public and Land-Grant Universities. Extension educators set the stage for stable relationships, inter-organizational linkages, and feedback loops upon which localized food systems could be built **(**Dunning et al., 2012; Gulati & Gargiulo, 1999; Ramasawmy & Fort, 2011; Sundkvist, Milestad, & Jansson, 2005). OSU Extension provides leadership for statewide food hubs, farmers markets, and the Ohio Farm to School program.

Philanthropy

Philanthopy is another way alumni and friends are engaged as OSU tackles complex global problems related to food production and security. In 2016, a $5 million gift from an individual donor was the first contribution toward transforming the 261-acre Waterman Farm on campus into a more comprehensive research, learning, and outreach hub for the study of urban agriculture, food security, and food systems. OSU's Garden of Hope, also located on the Waterman farm, helps cancer survivors and their caregivers understand links between health, nutrition, and the cancer-fighting properties of freshly grown fruits and vegetables. Community-university engagement is frequently evident in fundraisers that feature local foods and raise money to advance food system projects. In 2011, one week before the annual OSU football game against the rival team up north, the two schools participated in a different kind of match-up as top chefs from each school engaged in an Earth to Table sold-out dinner competition to support

the Culinary Vegetable Institute's educational efforts with local schools. Gifts and grants from corporations, foundations, and individuals are vital to OSU's focus on food systems.

Food System Resource Stewardship

Similar to other urban universities, creating a campus culture that embraces sustainability, communicates its benefits, and rewards innovation is a key initiative at OSU. Sustainable food systems are an integral part of stewardship developments (Barlett, 2011). OSU participates in a network of higher education presidents committed to climate change and sustainability actions (http://secondnature.org). At OSU, the President and Provost's Council on Sustainability advises and oversees the integration of sustainable practices, programs, and projects.

One of OSU's sustainability goals is to increase production and sales of locally and sustainably sourced food to 40% by 2025. This is a significant commitment, as the university serves 40,000 daily meals to diverse individuals interested in sustainably sourced, healthy, affordable, safe, delicious, culturally appropriate food that meets a range of food preferences and allergies. OSU's total annual food budget includes student dining, medicine, and event hospitality. As one of many large food purchasers, attention is also directed toward impacts in the larger community. Excess food at OSU is repurposed for use at a later date, donated to foodbanks, or turned into pulp to be used for renewable energy. In 2013, OSU conducted an assessment of waste and recycling materials, which resulted in an expanded organics diversion program and a goal of achieving zero food waste by 2025. Additional programs to donate food include a program created by the undergraduate student government, which allows students to take unused dining service credits in the last two weeks of each semester to buy non-perishable food to benefit Neighborhood Services.

Students have been actively engaged in OSU's food sourcing sustainability goal through shared governance, student life activities, a capstone course, research, and activism. Research included a thesis on analyzing OSU's food purchasing system (Kingston, 2015). Student interest in food purchasing escalated into discontent and unrest, becoming apparent in #ReclaimOSU. Disputes over definitions led to a 2015 student sit-in, demanding the university president sign the Real Food Campus Commitment. In 2016, students advocating for improvements in the university's food system won $5,000 through Plate of the Union, a national grass-roots campaign calling for reforms to the nation's food system. Real Food OSU co-hosted a teach-in with Defend Our Future and several other student organizations.

OSU administrators, faculty, staff, and student organizations continue to find common ground on definitions and practices that meet OSU's sustainable goals, student expectations, and multiple stakeholder agendas. Food system developments and sustainability practices are influenced through OSU's shared governance of the University Senate. Universities need collaborative agents of change (Bradshaw & Fredette, 2009) and shared governance in higher education decreases conflict (Delbecq, Bryson, & Van de Ven, 2013). From the board of trustees to administrators, professors, dining services, and students, most university stakeholders commit to food system stewardship. Complexities arise due to diverse sustainability meanings and measures. OSU's especially ambitious sustainability goals related to food purchasing and food waste challenge everyone involved in the university food system. A unique aspect at OSU is the

involvement of shared governance through the university senate, which includes faculty, administration, and student representatives.

Conclusion

Food systems will remain a challenge as the world's population continues to move to urban areas and grow to the projected 9.7 billion by 2050 (http://www.un.org). As food demands increase by 60 percent, urban university administrators, faculty, staff, students, alumni, partners, and other friends need to continue finding common ground for a sustainable future. As a land-grant, urban-serving, Carnegie-engaged, research university, OSU has a moral and civic obligation to engage in important issues on local, national, and international levels. Key lessons learned through this study include the dynamics of a collective approach and the value of leadership.

Dynamics of a Collective Approach

OSU's collective food systems approach aligns with the university's mission, vision, values, and goals (see Figure 2). Progress is evident across the university as collaborators address the complexities of this grand challenge. This case study presents what was common and what was particular to OSU's collective approach to food system issues. Most notably, were the strategic resource investments to collectively address complex food systems and the inclusion of advancement, alumni, and other perspectives.

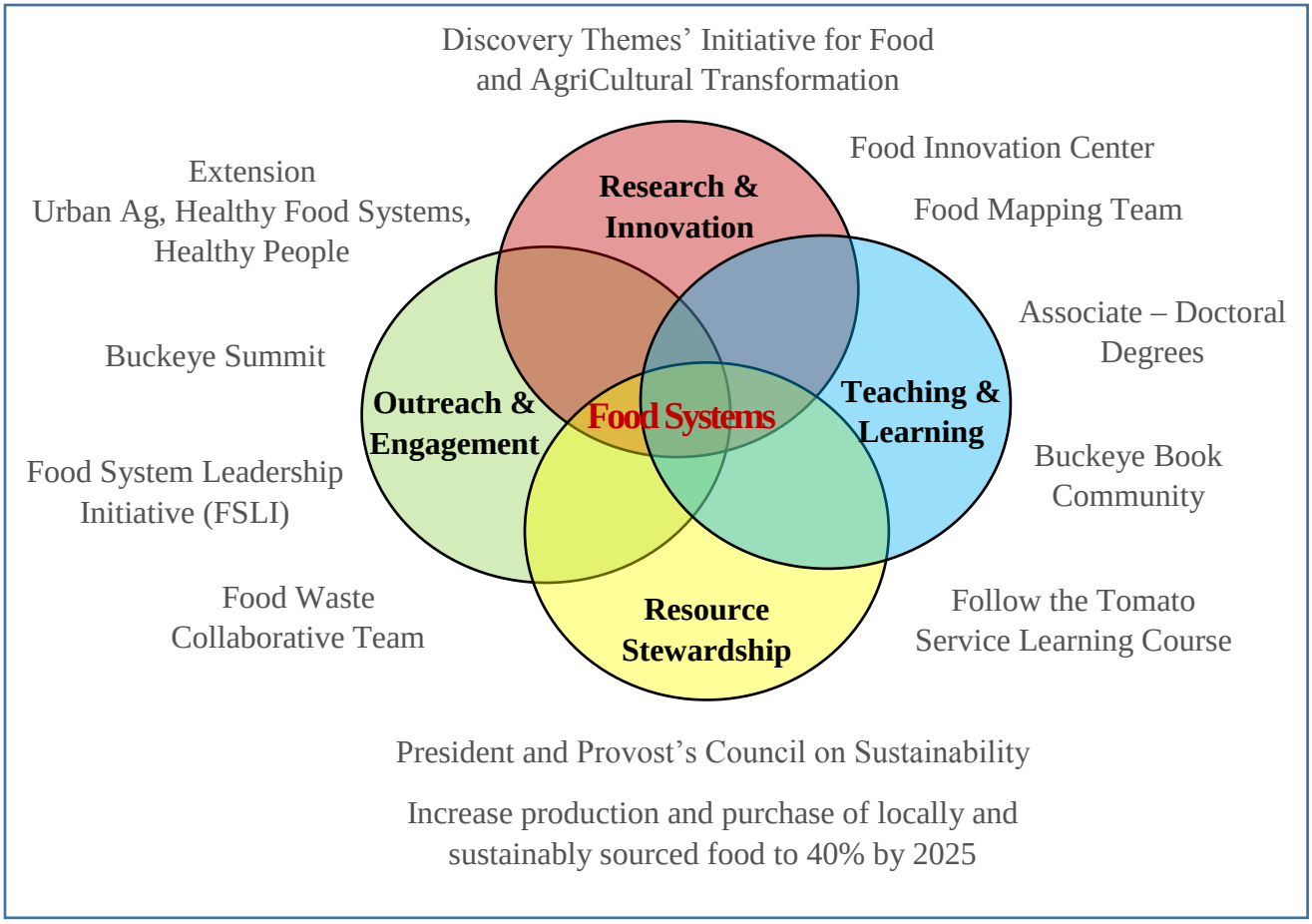

Figure 2. Examples of OSU's Collective Approach to Food Systems–Align with the University's Mission. OSU is exploring ways to capture and communicate shared impacts. Many of the intentional collaborative efforts have been established in the past 10 years. Discovery Themes, for example, are still in early stages of development as new faculty test transformative approaches for food system teaching, research, and engagement. Impact reporting will play an essential role in future investments.

Value of Leadership

Food system leadership begins at the highest levels and is strengthened by the collaborative commitment of diverse stakeholders. Urban universities are being approached by students, neighborhoods, city and county governments, and others to play an increasingly active role in addressing complex challenges of urban revitalization (Sterrett, 2009). Food systems enmesh linkages between metropolitan cities and rural countryside, with movement of people, goods, capital, and other social transactions, which influences rural and urban change (Tacoli, 1998). Urban universities can boldly lead divergent discourse on the multiple dimensions of food systems. Leaders at all levels can advance food systems by asking questions for inclusive dialogue, leveraging unique urban university assets, respecting the distinct role of public and private interests, and recognizing the interdependencies of urban and rural; local and global; and conventional and alternative. OSU food system stakeholders can continue to learn with other

urban leaders, such as the National League of Cities, and Food and Agriculture Organization (FAO) of the United Nation's "Food for Cities," a community of practice with more than 2,500 members from 114 countries connecting research and practice on sustainable food systems and urbanization. Food system leadership has deliberately been developed through projects such as the Food System Leadership Initiative and the cultivation of systems leaders through the Sustainable Food Lab global network, but there is tremendous opportunity to bring an urban focus and collective approach to food system leadership development. Urban university leaders can make significant collective impact by uniting. Many urban serving universities share a commitment to food systems and food security. Universities can benefit from collaborating with one another to leverage unique assets and account for specific limitations of each institution.

Shared commitment, collective resources and diverse perspectives ensure that strategic priorities will continue to advance, even in the face of inevitable obstacles. During the five-year period of this study, the emphasis on transdisciplinary food system impacts has engaged multiple contributors to make significant developments. Additional discoveries will emerge as urban universities continue to explore a strategic shift from individual projects to a more collective approach to complex food system issues and opportunities.

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Appendix

Documents from the following resources were reviewed and coded for content in one or more of the following categories: teaching and learning; research and innovation; outreach and engagement; and resource stewardship.

Agricultural Technical Institute, https://ati.osu.edu
Agroecosystems Management Program, http://amp.osu.edu
Association of Public and Land-grant Universities (APLU), Engagement and Outreach, http://www.aplu.org/members/councils/engagement-and-outreach
Buckeye Book Community, https://fye.osu.edu/bbc.html
Buckeye Food Alliance food pantry, http://www.buckeyefoodalliance.org
Buckeye Summit, https://buckeyesummit.osu.edu
Campus Partners for Community Urban Redevelopment, http://campuspartners.osu.edu
Carnegie Classification of Institutions of Higher Education, http://carnegieclassifications.iu.edu
Carnegie Foundation for the Advancement of Teaching's 2015 Community Engagement Classification, www.carnegiefoundation.org
Center for Advanced Functional Foods Research and Entrepreneurship (CAFFRE), https://u.osu.edu/caffre/food-centers
Center for Ethics and Values, https://cehv.osu.edu
Coalition of Urban and Metropolitan Universities (CUMU), http://www.cumuonline.org
College of Arts and Sciences https://artsandsciences.osu.edu
College of Food, Agricultural, and Environmental Sciences, http://cfaes.osu.edu
Community Research Partners, www.communityresearchpartners.org
The Conversation (food security article), https://theconversation.com/u-s-is-a-land-of-plenty-so-why-do-millions-of-americans-still-go-hungry-55791
Department of Food Science and Technology, http://fst.osu.edu

Discovery Themes, https://discovery.osu.edu
Everybody Eats: Exploring Food, Flavors, and Faith, https://religion.osu.edu/events/food-family-and-faith-soup-nuts-abrahamic-traditions.-kickoff-series-everybody-eats-exploring
Extension, http://extension.osu.edu
Faculty Cluster Hiring Report, Urban Serving Universities, http://usucoalition.org/images/Faculty_Cluster_Hiring_Report.pdf
Food and Agriculture Organization of the United Nation's "Food for Cities," http://www.fao.org/fcit/en
Food Fellows, https://u.osu.edu/foodfellows/home
Food Industry Center, http://foodindustries.osu.edu
Food Initiative, www.osu.edu/initiatives/food.html
Food Innovation Center, http://fic.osu.edu
Food System Leadership Initiative, www.fsli.org
Food Waste Collaborative, https://u.osu.edu/foodwaste
Garden of Hope, https://cancer.osu.edu/blog/garden-of-hope-offers-survivors-wholesome-cancer-fighting-foods
Healthy Food Systems, Healthy People, http://www.aplu.org/projects-and-initiatives/agriculture-human-sciences-and-natural-resources/healthy-food-systems-healthy-people
Internet archive, Wayback Machine, www.archive.org
John Glenn College of Public Affairs (food policy), http://glenn.osu.edu/research/food-policy
Joint Council of Extension Professionals, http://jcep.org
Knowledge Bank (Local and Sustainable Food Purchasing at The Ohio State University: Capstone Course Proposal), http://kb.osu.edu/dspace/handle/1811/76746
Knowlton School of Architecture, http://knowlton.osu.edu
Living Culture Initiative, https://u.osu.edu/livingculture
Local Food Action Plan, https://www.columbus.gov/publichealth/programs/Local-Food-Action-Plan
Mapping the Food Environment, http://foodmapping.osu.edu
National League of Cities, http://www.sustainablecitiesinstitute.org
National Science Foundation, Rankings by total R&D expenditure, https://ncsesdata.nsf.gov/profiles/site?method=rankingBySource&ds=herd
New Engagement: Exploring the Issues Across a Spectrum, http://www.aplu.org/library/the-new-engagement-exploring-the-issues-across-a-spectrum/file
Office of Academic Affairs, https://oaa.osu.edu
Office of International Affairs, https://oia.osu.edu
Office of Research, http://research.osu.edu
Ohio Agricultural Research and Development Center, http://oardc.osu.edu
Ohio Campus Compact statewide non-profit coalition of 41 college and university presidents and their campuses, http://www.ohiocampuscompact.org
Ohio Farm to School program, http://farmtoschool.osu.edu
Outreach and Engagement, http://outreach.osu.edu
Pay It Forward OSU student cohort, http://payitforward.osu.edu
P12 initiative, http://p12.ehe.osu.edu
Plate of the Union, www.plateoftheunion.com
President and Provost's Council on Sustainability, https://president.osu.edu/leadership-and-committees/president-and-provosts-council-on-sustainability.html

President Drake's Vision 2020, www.osu.edu/features/2015/2020-vision.html
President's Prize, President's Prize, https://presidentsprize.osu.edu
Real Food Challenge, www.realfoodchallenge.org
Real Food OSU, https://www.facebook.com/RealFoodOSU
Student Life Center, http://studentlife.osu.edu
Sustainable Food Lab, http://www.sustainablefoodlab.org
Targeted Investments in Excellence (2006 – 2011) https://oaa.osu.edu/tie.html
Technology Commercialization Office, https://tco.osu.edu
University Communications, https://researchnews.osu.edu
University Senate, http://senate.osu.edu
University Vision and Mission 2016, https://oaa.osu.edu/vision-mission-values-goals.html
Urban Institute's National Neighborhood Indicators Partnership, www.neighborhoodindicators.org
Urban October, http://www.urbanoctober.org
Urban Universities for Health (cluster hiring), http://usucoalition.org/images/Faculty_Cluster_Hiring_Report.pdf
Student organizations, http://www.ohiounion.osu.edu/get_involved/student_organizations
World Food Prize, https://www.worldfoodprize.org
WOSU Public Media, http://wosu.org

Urban Agriculture and Campus Sustainability: Recent Books

Stephanie Ritchie

Abstract

Food and agriculture meet an essential need of all humans and the details of how food is produced, distributed, consumed, and disposed is of increasing interest (Hedegaard Larsen, 2016). To meet the growing expectations of the campus community, many college and university decision-makers are including food and agriculture concerns as part of curricula, and in the planning, development, and sustainability efforts. This selected bibliography includes a selection of recently published books covering issues relevant to institutions of higher education on food, agriculture, and sustainability efforts.

Keywords
Urban farming, Student farms, Sustainability, Higher education, Food systems

Introduction

This bibliography brings together books that discuss food and agriculture activities, either on campuses or in urban settings, to inform food and agricultural work on urban campuses. Books selected cover farming activities in urban settings, and perspectives from administrators, educators, public officials, and others that share challenges of determining how best to integrate food production and other sustainability activities to successfully meet goals and expectations. Together, this collection provides a broad overview of food and agriculture topics likely to be of most importance in an urban campus setting.

This collection is organized into topic areas that cover urban agriculture, designing spaces for agriculture, and agriculture as part of greater sustainability efforts. Each of the books included were published within the past five years, and provide background and deeper exploration of urban agriculture concepts for a reader interested in a comprehensive look at each specific topic.

Urban Agriculture

Urban agriculture, at its most basic, is defined as the production of food (and other agricultural products) within a city. The books included in this section specifically focus of food production activities and the local food systems that encompass our urban areas.

Ladner, P. (2011). *The urban food revolution: Changing the way we feed cities*. Gabriola Island, B.C.: New Society Publishers. xi, 291 pgs.: illustrations, map. ISBN: 9780865716834

Primarily written for public officials and planners, *The urban food revolution: Changing the way we feed cities* covers the landscape of urban agriculture through a series of chapters that examine

the broad range of interrelated issues among food production, urban planning and public health. Although intended to provide advice to decision-makers about what they can do to improve access to healthy food for their constituents, this book is particularly useful to those readers with no prior knowledge of food systems literature.

Using site visits and interviews with urban agriculture projects across the United States and Canada, Ladner characterizes success for proven and emerging urban agriculture strategies. The introductory chapters summarize the most pressing challenges of the current food system. Later chapters focus on innovation that campus decision makers may find helpful as they plan campus food system and sustainability efforts. To conclude the book, Ladner offers solutions that have worked at various levels of government including city and local levels that are likely to be similar and tied to campus-level food system decisions. These recommendations are particularly useful as Peter Ladner brings a wealth of knowledge about community-level urban agriculture from his years spent serving as a Vancouver City Councilor (2002-08). There, he worked with the Vancouver Food Policy Council, and as a Fellow at Simon Fraser University Centre for Dialogue, researching and educating on the theme ”Planning Cities as if Food Matters.” Here, he has deftly translated the ideas and academic research from the food and agriculture policy realm into an easily understood summary for each of the topics covered. Additional sources of information are found in extensive references and notes for each chapter.

Supplemental Information
Urban Food Revolution Blog from Peter Ladner: http://www.urbanfoodrevolution.com/
Urban Food Revolution Presentation: https://www.youtube.com/watch?v=UGxakDsbxAk
Food Talks Vancouver with Peter Ladner: https://www.youtube.com/watch?v=7IiDPLa5Ivc

Reynolds, K., & Cohen, N. (2016). *Beyond the kale: Urban agriculture and social justice activism in New York City*. Athens, GA: University of Georgia Press. 189 p. ISBN: 9780820349503

The purpose of urban agriculture often reaches beyond food production, to become a tool to create social and environmental change. From this perspective, urban agriculture is not only the food produced, but the socioeconomic, political, environmental, and other social actions that intertwine with the act of food production to impact individual producers, consumers, and communities. Urban farms may be understood as tools to resist food insecurity, or spaces to reconnect to nature; they may be “safe spaces” for the oppressed, or places for the community to connect. These spaces, and the activities held within those spaces, impact food systems, as well as community development, community building, and community preservation work.

Through the lens of New York City, Reynolds and Cohen observe urban agriculture and its place in social justice movements. They provide a framework for analysis which includes critical race theory, theories of intersectionality and oppression, ideas about social justice work, and research and writing to support activism. They use interviews with people of color and other activists who do not resemble the white, middle-class couples often portrayed as the face of urban agriculture in media, to illustrate and embody themes across urban agricultural activism.

Reynolds and Cohen acknowledge that this book is an activist effort, while also recognizing their positions of privilege as "white, upper middle class academics" at Yale University/The New School and City University of New York, respectively. Their intention is to address a broader lack of significant discourse about injustices in urban agriculture and food systems. They hope that future discussions will include the voices of people of color and other marginalized groups.

For administrators, staff, and faculty on campuses, the understanding that efforts to create, expand, promote or otherwise encourage urban agriculture may also indicate a social justice mission on the part of student and community activists, could be necessary to successfully support these projects. An urban agriculture project is not always just about food. *Beyond the Kale* offers clues to making urban agriculture projects inclusive, socially just, and transformative. More information about exemplary farms and projects highlighted in this book is available in the appendices as models for socially active urban agriculture projects.

Supplemental Information
Beyond the Kale Project: https://beyondthekale.org/
Urban Food Policy Forum: Beyond the Kale:
http://www.cunyurbanfoodpolicy.org/events/2016/9/15/urban-food-policy-forum-beyond-the-kale-urban-agriculture-and-social-justice-activism-in-new-york-city
Beyond the Kale: Preliminary Findings Video:
https://www.youtube.com/watch?v=2I5ID3HpbuY

Cockrall-King, J. (2012). *Food and the city: Urban agriculture and the new food revolution*. Amherst, NY: Prometheus Books. 372 p.: illustrations. ISBN: 9781616144586

Food and the city: Urban agriculture and the new food revolution opens with several chapters that cover the history and current state of supermarkets, the conventional/industrial food chain, and the role of the "eaters" in the food system including humans (consuming food), animals (consuming feed) and machines (consuming fuel). These introductory chapters are capped off by an examination of several crises' that face agriculture–from climate change to reaching the "peak" of several natural resources.

In contrast, urban agriculture is introduced as a panacea for all the failures of the industrial food system. A brief history of what Cockrall-King terms the "new food movement" from the 1990s to today prefaces a series of chapters that tour various locales in Europe and North America to detail the history and current work in urban agriculture. Cities profiled include Paris, London, Los Angeles, Vancouver, Toronto, Milwaukee, Detroit, and several in Cuba. Cockrall-King visited urban farms, gardens, allotments, balconies, and many other creative models of using urban space to grow food. She includes photos and interviews with individual growers, as well as information about the political and cultural setting these gardens exist within. These profiles will be of particular interest to those located in these cities or cities with similar characteristics.

Jennifer Cockrall-King is a Canadian food journalist, and as such, primarily uses this book to tell a story about the beneficial potential of urban agriculture. Her passion for the subject is apparent, but no critical analysis of the proposed benefits is covered. A bibliography, chapter notes, references for further information on urban agriculture and a short glossary for concepts covered

in the text are included as supplementary material. These supplementary materials will be of particular aid to those looking to develop a basic competency with urban agricultural concepts and stakeholders.

Supplemental Information
Jennifer Cockrell King's Blog: http://foodgirl.squarespace.com/
Food and the City: Interview with Jennifer Cockrall-King:
https://www.youtube.com/watch?v=Jo7WCfgvPsA
Urban Agriculture Meeting Demands in Unlikely Places: Resistance is Fertile Presentation:
https://www.youtube.com/watch?v=ZlKdaC4fpNY

Sayre, L., & Clark, S. (2011). *Fields of learning: The student farm movement in North America*. Lexington, KY: University Press of Kentucky. xx, 354 pages: ills. ISBN: 9780813133744 Retrieved from http://muse.jhu.edu/book/1980

Serving as part history and part collection of present day case studies, *Fields of Learning* tells the story of past and ongoing efforts to incorporate land-based learning activities at student farms on college and university campuses across the United States and Canada. Fifteen case studies cover student farms from those with origins in their institutions' agricultural training mission of the 19th century to present-day programs sprouted from a renewal of interest in food systems. Student farms profiled exhibit both (a) opportunities for educational experience as part of a program by an accredited, degree-granting college or university; and (b) opportunities for students to lead or substantially direct farm activities. Each case study offers insight into the varied paths and practices for successfully creating and maintaining student-run farms as parts of campuses with competing educational priorities, needs for space, and student experiential offerings. The book is concluded with a short chapter of guidelines for starting a student-run farm, with examples drawn from lessons learned in each of the case studies.

Laura Sayre has extensively studied and written on the history of agriculture, especially the transmission of agricultural knowledge, community and collaborative activities in agriculture and the role of agricultural traditions in contemporary agriculture. Her work as part of the Rodale Institute's New Farm, where she compiled a comprehensive database of student farms in North America, forms the basis for her insight into the range of student farms. Dr. Sean Clark provides a case study from his student farm at Berea College, as well as practical guidance for starting and managing a student educational farm in the conclusion.

Fields of Learning will be a useful source of information for anyone involved in decision-making for student-run farms on a college or university campus. A variety of higher education institutions across the United States and Canada from small to large, urban to rural, or public research to private liberal arts are highlighted by the case studies so that any type of college or university considering a student farm will find comparable settings and characterizations. An inventory of student farm projects with data for geographic area, size, products, organic certification, and marketing outlets is included as an appendix and will be helpful for locating nearby or student farms with specific characteristics.

Supplemental Information

Laura Sayre: http://www.laurasayre.net/
Dr. Sean Clark: https://www.berea.edu/anr/faculty-and-staff/dr-sean-clark/

Designing Spaces for Food

Both of the books reviewed in this section examine the role of food production in public spaces. University and college campuses are public space for the campus community and often viewed as de facto public spaces by the surrounding communities and stakeholders, especially if they are part of a public institution. The reviewed books offer ideas about how public space for food production has functioned historically, in the present, and might transform in the future.

Nordahl, D. (2014). *Public produce: Cultivating our parks, plazas, and streets for healthier cities*. Washington: Island Press. xiv, 204 pages: illustrations. ISBN: 9781610915496

Public Produce: Cultivating Our Parks, Plazas, and Streets for Healthier Cities is about putting food at the center of the urban environment. The "public produce" of the title is just that, produce grown on mainly urban public land for the free use by the public. Nordahl ties the idea of "civic agriculture," a system that fosters environmentally, economically, and socially sustainable agriculture focused on local markets and cooperative relationships, to the use of public land to grow food that meets these aims. Nordahl suggests the use of public land for food production and he examines the perceived benefits and challenges in greater detail.

First, Nordahl addresses food security benefits regarding urban agriculture projects on public land, where the increased access to free, local food is seen as a tool to combat food distribution inequities. A look at the socioeconomic and health impacts of inexpensive industrial food versus whole (and often locally grown) food connects ideas about access to greenspace and healthy food options in urban settings to food production as an integral part of public health.

After advocating public produce, Nordahl addresses logistical concerns that those considering implementation of such a project hold. He provides examples of public projects that replace landscape plants with edible plants—pansies for plum tomatoes and grass for greens—on land owned by public institutions and freely accessible to citizens. Each of these examples offer creative ideas that have been successfully implemented with varying degrees of scale, infrastructure, and support. Nordahl also details gleaning (the harvest of excess food from farm fields after clearing for commercial sale) and foraging (the harvest of food from wild or unharvested public sources) projects in urban areas to showcase models for more equitable access to food and community building activities that can arise when groups of people come together to share in food access work.

Lastly, Nordahl highlights how urban agriculture in public spaces functions as an education tool about food production, especially for those that only have little concept of how the food they find in a grocery store is grown. Urban agriculture projects are considered not just as places for food production, but educational spaces where knowledge about food and its impact in the larger society may be taught, discussed, and transformed.

Darrin Nordahl works in urban design and planning, focused on using agriculture and transportation to transform public spaces and improve quality of life in urban settings. This book is recommended for those that make decisions about the use of land in public spaces, especially land owned by public institutions and governments.

Supplemental Information
Urban Farming Pioneers: Darrin Nordahl promoting Urban Agriculture: https://www.youtube.com/watch?v=aV3IFgCyHmE&list=PLE4B6106FF2928807&index=3
Darrin Nordahl: http://darrinnordahl.com/

Parham, S. (2015). *Food and urbanism: The convivial city and a sustainable future*. London; New York: Bloomsbury Academic. 362 pages: illustrations. ISBN: 9780857854520

In *Food and urbanism: the convivial city and a sustainable future*, Susan Parham critically explores how food and cities are interconnected at different spatial levels: within private space, as part of urban public space, and at the peri-urban fringes.

The first part of the book explores urban food spaces as part of the home. It focuses on the table as the center of food in our domestic space and extends to the design of the kitchen. It uses historical and sociological context to explore food practices around the table and within the kitchen. This initial section of the book also examines the home garden from the design and siting of gardens as food production spaces to outdoor dining and the use of gardens for food consumption rather than production.

The next section features food and its role in public spaces, from outdoor farmers' markets to street food and restaurant districts. This section also covers the rise of suburban development, and with it, the creation of supermarkets and shopping centers as sources of food, completely distinct from historical paradigms of food access. The history, decline, and recent reemergence of agriculture in urban green space is set into a discussion of changing ideas about land use and food resilience in a modern context.

The last section looks at the periphery of urban areas including impacts on food production resulting from development at the city edge. Strategies such as food and agri-tourism are highlighted as strategies to reduce impacts of urban sprawl. One chapter considers challenges of supporting food space in large urban areas including the emergence of fast food chains, food deserts, and planned (and often gated) communities. Finally, the relation of larger regional food systems to urban food spaces, ties between urban and rural places, and how concepts such as slow food and regional food branding translate to local food systems, serve to unite ideas about food across spatial scales around urban areas.

Food and urbanism: The convivial city and a sustainable future is a dense work of scholarly literature from Dr. Susan Parham at the University of Hertfordshire's Centre for Sustainable Communities in the United Kingdom. Dr. Parham has studied the relation between food and cities since the early 1990s. Her long interest in this topic area has resulted in an extensively researched and comprehensive work on the role of food in urban space. This work is recommended for those that want to deepen their understanding of the historical and social

context for current urban agriculture activities. An extensive bibliography provides many additional sources of academic research into aspects of food, agriculture, and urban environments.

Supplemental Information
Susan Parham Research Profile: http://vuh-la-risprt.herts.ac.uk/portal/en/persons/susan-parham(e4f5a6cb-f918-4754-9305-979fd2f8b8e6).html
TVAD (Theorising Visual Art and Design Research Group) Talk - You're toast! with Dr Susan Parham: https://www.youtube.com/watch?v=SjI9CsA0GCU

Sustainability on Campus

Sustainability initiatives are often where urban agriculture activities are encouraged and administered on college and university campuses. The books reviewed in this section explore how to lead successful sustainability work across campus–from development projects to classroom courses.

Thomashow, M. (2014). *The nine elements of a sustainable campus*. Cambridge, MA: MIT Press. xii, 236 pages. ISBN: 9780262321570

Based on the experience from the Thomashow's tenure as a college president, *The nine elements of a sustainable campus,* provides a model to meld a progressive environment and sustainability ethic with the practical challenges of leading a college. The book is organized into chapters for each of the nine elements: (a) energy; (b) food; (c) materials; (d) governance; (e) investment; (f) wellness; (g) curriculum; (h) interpretation; and (i) aesthetics. A brief history and orientation to the importance and academic thinking on each element is interwoven with anecdotes from the author's own experience to place the reader at the moments when Thomashow recognizes his agency in the sustainable transformation of his institution. Creative suggestions to deal with challenges facing college and university administrators—from how to sustainably deal with deferred maintenance of aging infrastructure to looking at institutional finances through an ecological lens—follows for each of the nine elements. These suggestions are culled from both Thomashow's experience and the creative thinking from innovators in each element topic area.

Thomashow was President of Unity College in Maine from 2006-11, where he lead the transformation of the liberal arts college to a leader in sustainability science as informed by his long professional and personal interest in environmental issues and sustainability. At the writing of the book, Thomashow was leading and consulting on sustainability for colleges and universities across the United States.

Administrators, facility managers, and other involved with the management and planning for university and college campuses may face similar challenges to Thomashow's in conceiving and implementing sustainable strategies to meet the ideal requirements of the students, faculty and staff, alumni, the surrounding community, other stakeholders, and the leaders themselves. His approach that the campus exists at human-scale—the right scale to experiment with and implement sustainability ideas—may encourage creative strategies within and beyond the borders of campus.

Supplemental Information
Antioch University Environmental Studies Colloquium: The Nine Elements of a Sustainable Campus – Mitch Thomashow: https://www.youtube.com/watch?v=fZ_563Oj2A0
American College & University Presidents Climate Commitment (ACUPCC) On Air #1: An Interview with Dr. Mitchell Thomashow: https://www.youtube.com/watch?v=wIxRk93ZHjA
Mitchell Thomashow: http://www.mitchellthomashow.com/

Barlett, P. F., & Chase, G. W. (Eds.). (2013). *Sustainability on campus: Stories and strategies for change*. Cambridge, MA: MIT Press. xiv, 319 pages. ISBN: 9780262019491

Editors Peggy Barlett and Geoffrey Chase compiled two dozen case studies on several threads of sustainability at college and universities in the United States. This book traces more than a decade of sustainability work in higher education since their earlier book, Sustainability on campus: stories and strategies for change (Cambridge, MA: MIT Press, ©2004), showcased nascent programs on campuses. This book focuses on leadership and change as a part of each profiled institution's ongoing story. Many of the invited contributors are involved with the Association for the Advancement of Sustainability in Higher Education (AASHE).

Each case study is organized into one of the major themes: (a) Leadership and Commitment; (b) Curricular Transformations; (c) Defining the Paradigm for Change; (d) Institutional Mission and Culture of Sustainability; (e) Accountability; and (f) Professional and Personal Transformation.

In Leadership and Commitment, personal testimonies including Wendy B. Anderson at small liberal arts Drury University, David Whiteman at the urban University of South Carolina, and various faculty at the historically black Florida A&M University, detail the transformation of themselves and their campuses through sustainability efforts. As a counterpoint, Julie Snow at state college Slippery Rock University bravely details her slow start and failures and well as her eventual successes.

In Curricular Transformations, new focus on local bioregions and global sustainability, and refocus from environment to sustainability, shifts the educational experience to future-facing challenges. William Van Lopik of the College of the Menominee Nation shares how a core course in sustainable development for all students provides education on not only on traditional sustainability topics like recycling or the natural environment, but also personal practices and the sustainable philosophy of the Native American nations and people.

The theme, Defining the Paradigm for Change, explores creative models of organizing campus sustainability work. Staff of the Graham Environmental Sustainability Institute at the University of Michigan-Ann Arbor share initiatives for cross-campus student group coordination, campus-wide sustainability assessment, and for-credit, student-instigated sustainability projects. E. Christian Wells of the University of South Florida, reflects on using the metabolic view—thinking of the campus as a living organism with inputs and wastes—in a course project, that later expanded to a greater campus initiative. Kapi'olani Community College professor Krista Hiser uses Brafman and Beckstrom's Spider and Starfish model to describe how their

decentralized network of faculty functions like a starfish in a non-hierarchical, leaderless model of a collaborative circle.

The Institutional Mission and Culture of Sustainability theme unites multiple narratives from faculty and staff of a range of higher education institutions on their organizational history of sustainability initiatives. Institutions profiled include Spelman College, a historically black college for women, Santa Clara University, a historic Jesuit university, Warren Wilson College, a liberal arts college with service, work and academic requirements for students, Unity College, an experiential learning focused liberal arts college, and Furman University, a southern liberal arts university.

Accountability is represented by a set of projects that use tools such as goals, standards, and administrative structures to demonstrate success of sustainability efforts on campus. Sustainability strategic planning at Yale University keeps sustainability efforts a priority of the administration to meet the goals of the plan as an ongoing effort. Arizona State University and its School of Sustainability tackles building an interdisciplinary degree program and developing core competency for sustainability research and education. The University of Wisconsin Oshkosh shares its commitment to becoming the first U.S. Fair Trade University, integrating its principles into not only campus dining, but curricula and student experiences. Management of some university services at San Diego State University by the Associated Students Council, a student directed board, incorporates student led sustainability initiatives and institutionalized a sustainability advocacy within the organization.

Lastly, the Professional and Personal Transformation section touches on teaching and learning processes that covers sustainability as a new approach to thinking and living. These reflective essays offer innovative methods to share sustainability knowledge. One advocates for reflection and contemplation as a cornerstone of a faculty learning community, which explores how to incorporate these practices into the classroom setting with the goal of deepening understanding. Another reconceives learning as a living system which blurs roles between students and teacher, perception and assumptions, structured and sequenced, and thus the course becomes a series of collective learning experiences rather than self-contained, passive listening events. The last piece looks at teaching as a relationship, with self and with the earth, and developing a set of experiences to explore relationships within and between, therefore changing consciousness about those relationships.

With a wealth of perspectives, settings, and experiences, this book is highly recommended for higher education leaders looking for new strategies and ideas for their own institutions. Anyone interested in the intersection between learning and sustainability will find one of many parts of this book of interest.

Supplemental Information
Campus Sustainability Month: http://www.aashe.org/campus-sustainability-month/
Sustainability at Emory: Building Community by Going Green (with Peggy Barlett): https://www.youtube.com/watch?v=sxjinY8bqwk
Preparing Students for a Changing Climate (with Geoffrey Chase): https://www.youtube.com/watch?v=0TBy_t0Y4D4

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Parham, S. (2015). *Food and urbanism: The convivial city and a sustainable future*. London; New York: Bloomsbury Academic.

Reynolds, K., & Cohen, N. (2016). *Beyond the kale: Urban agriculture and social justice activism in New York City*. Athens, GA: University of Georgia Press.

Sayre, L., & Clark, S. (2011). *Fields of learning: The student farm movement in North America*. Lexington, KY: University Press of Kentucky. Retrieved from http://muse.jhu.edu/book/1980

Thomashow, M. (2014). *The nine elements of a sustainable campus*. Cambridge, MA: MIT Press.

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