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.

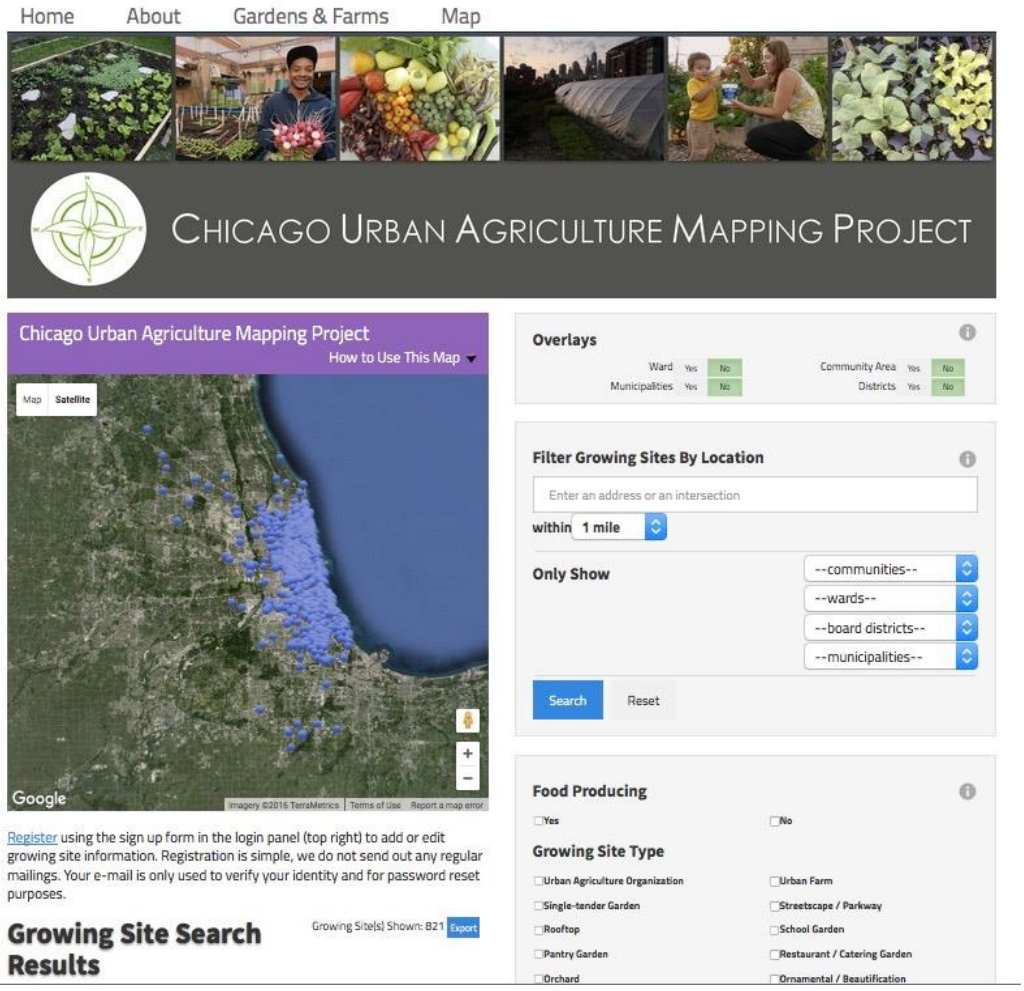
As urban agriculture policy and planning unfolded at the state and municipal levels during the past decade, almost all the major Chicago universities have added curricular, research, technical assistance, and community service focused on local and sustainable food systems. In 2012, along with a colleague 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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