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Provisioning the 21st Century City: Community and School Gardens as Food Centers

Charleen L. Kepner

Imagine you're cooking dinner with fresh produce from your community garden—tomatoes, herbs, and garlic. The pasta you're making, grown just blocks away, feels special. The earthy scent and buzzing pollinators in the garden bring you joy. You're proud to contribute to sustainable practices. That plate of pasta isn't just dinner; it's a symbol of your connection to the earth and your community.

In the new global economy, food security, food safety, and proper nutrition have become critical issues for cities. Urban and suburban areas are more densely populated and rural communities are emptying out. Soil available for food production is eroding, temperatures are creeping up, and food provisioning systems are being faced with challenges unheard of just decades before.[1] Distribution channels must remain open if we are to move food from rural areas of production to urban areas of consumption and that comes with a heavy carbon footprint. Suburban and urban areas must begin to have discussions of how to provision the 21st Century City. In the Portland Metro Area, backyard and community gardens may help citizens feed themselves and their neighbors.[2] Localized garden efforts by involved citizens can play a role in how provisioning the 21st Century City will happen. The allocation of resources says people with more means have better access to healthy food. This is true of community gardens as well; however, the tide is turning. Gardens can increase community engagement, environmental

[1] It is not the scope of this paper to discuss climate change, but rather the impact citizens can have in their local communities.

[2] Community gardens can be defined as any garden where people are empowered to work together to build and maintain garden plots on shared spaces. The gardens could be located at a school, a park or other neighborhood location.

education, and food security, making them an important aspect of equitably provisioning food for the 21st Century City. This paper will discuss the contributions of the grassroots efforts of everyday people who are using home, school, and community gardens as a way of augmenting local availability of healthy and nutritious food, without increasing pressure on distribution channels. Firstly, this paper will examine the importance of community engagement in provisioning for the city. Next, the paper will describe the role of providing environmental education for children and citizens. Lastly, I will relate how food security issues can be addressed with community gardening systems.

Community Engagement

The section below describes the importance of engagement in utilizing community gardens to engage urban dwellers in roles of food production. In terms of large-scale production, home and community gardens are not the answer for producing all the food a city will need, but community gardens can help to address part of the issue. However, as a community we have the potential to develop a thriving, healthy food culture in the city with strong links to the city region's food producers.[3] Residents can and should be included in the conversations around food production in urban settings. Being educated about where food comes from and the importance of strong food systems, such as community and home gardens, could prove pivotal in future provisioning efforts.

[3] This report comes from the research done in Bristol, England to help them reach the goal of becoming a green city by 2030. Joy Carey, *Who Feeds Bristol? Towards a Resilient Food Plan: Short Summary* (Bristol: Bristol Food Policy Council, 2011), https://bristolfoodpolicycouncil.org/wp-content/uploads/2013/03/Who-Feeds-Bristol-Summary.pdf.

People living in rural areas often had a space they could use to grow food to supplement their diets. Globally, home gardens have been documented as an important supplemental source contributing to food and nutritional security and livelihoods. As one study notes, "Food production on small plots adjacent to human settlements is the oldest and most enduring form of cultivation."[4] With more people expected to move to suburban areas, space to grow food becomes an issue. In the United States (U.S.), there is research being conducted to document the benefits of gardens in suburban areas. These types of gardens range from patio tomatoes and community gardens leased by park districts to large scale commercial urban farms, operating on industrial land or rooftops.[5] Consumers can find a range of ways to access locally grown food.

Let us now consider how community gardens can help connect communities to their food. In provisioning the city of tomorrow, it will be important to involve people in ways that help them foster self-reliance. With an eye to equity, it is important to consider the youngest generation. Children will be the experts of the future and involving them now is critical to problem solving the issues of tomorrow. Involvement with community gardening provides them with knowledge and resources to grow food for themselves and their future generations. The older generations will be the key to passing on generational knowledge and a project in Portland, Oregon is doing just that. The Native American Youth And Family Center (NAYA) is an organization that serves the urban Indigenous community in the Portland area, which has the ninth largest urban Indigenous community in the U.S. NAYA received a $3.69 million, five-year grant from the Portland Clean Energy Community Benefits Fund, and they are using the grant to

[4] Dilrukshi Hashini Galhena, Russell Freed, and Karim M. Maredia, "Home Gardens: A Promising Approach to Enhance Household Food Security and Wellbeing," *Agriculture & Food Security* 2, no. 8 (May 2013): https://doi-org.proxy.lib.pdx.edu/10.1186/2048-7010-2-8.

[5] Megan Horst, Nathan McClintock, and Lesli Hoey, "The Intersection of Planning, Urban Agriculture, and Food Justice: A Review of the Literature," *Journal of the American Planning Association* 83, no. 3 (July 2017): 277-295. https://doi.org/10.1080/01944363.2017.1322914.

create a farm on former baseball fields on one of their campuses.[6] They have created a traditional medicine garden, a community gathering space, a children's garden, and more. Mick Rose, the Wellness Coordinator for NAYA, states that they use the garden for more than just education: "Healing the Land is healing ourselves."[7] They are reclaiming the land, reclaiming their native foods, educating community members, and revitalizing native practices. NAYA has an active youth program that directly involves children and youth in working in the garden at all stages. In a twelve-week, garden-based nutrition intervention integrated within a YMCA summer camp, researchers found that fruit and vegetable intake among children is generally inadequate. As nutritional educators, they wanted to find ways to engage children and to encourage healthy eating.[8] When children have access to learning opportunities such as the ones provided at NAYA and the YMCA programs, we are equipping the next generation with the tools they will need. When programs involve community members, especially youth, foundational skills are built that can serve the urban areas they occupy. Next, the role of environmental education through community spaces will be introduced.

Environmental Education

This section will discuss the importance of environmental education of community members, focusing on healthy eating habits, sustainability issues, and stewardship of resources. At a community level there is a need to increase knowledge and skills in food production,

[6] "Community Garden," NAYA Family Center, accessed November 20, 2023, https://nayapdx.org/services/community-garden/.
[7] NAYA Family Center, "Community Garden."
[8] Stephanie Heim, Jamie Stang, and Marjorie Ireland, "A Garden Pilot Project Enhances Fruit and Vegetable Consumption among Children," *Journal of the American Dietetic Association* 109, no. 7 (July 2009): 1220–1226, https://doi.org/10.1016/j.jada.2009.04.009.

preparation, and cooking to build understanding of the impacts that food choices have.[9] Community gardens and urban farms can serve as educational spaces where school children can learn firsthand about urban farming practices. They can experience conservation efforts, see biodiversity, and learn about pollinators. When children are taught to care about the environment, they will want to take care of it as the adults of tomorrow.

According to the Food and Agriculture Organization of the United Nations (FAO), some of the barriers to providing food and nutrition to communities are lack of community members trained to support communities, the need to improve nutrition education in schools and communities, and the lack of jobs alongside the skills necessary to do the jobs.[10] In fact, the FAO report recommends that programs can be implemented to strengthen impacts on nutrition by improving equity by increasing access to resources. One recommendation is to empower women. In the U.S., one program is the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). WIC is a supplemental food program serving low-income people that incorporates nutritional information and access to specific healthy foods for women, infants, and children.[11] WIC provides vouchers that can be used in Oregon at farmers' markets. While there is no direct link to community gardens, the argument is that farmers markets are an excellent source of high-value food that is locally sourced. The program also has educational aims. WIC participants are offered the opportunity to enroll in nutrition education classes that inform caregivers about the nutritional needs of children, the benefits of breastfeeding, and the

[9] Carey, "Who Feeds Bristol?"
[10] Anna Lartey and Barbara Burlingame, *Agreeing on causes of malnutrition for joint action* (Food and Agriculture Organization: 2014), https://www.fao.org/3/i3516e/i3516e.pdf.
[11] "Oregon WIC Program," Oregon Health Authority, accessed April 20, 2024, https://www.oregon.gov/oha/ph/healthypeoplefamilies/wic/pages/index.aspx.

importance of physical activity.[12] Additionally, WIC provides women with education such as how to safely store and prepare food.

Teachers are a resource for accomplishing environmental education goals and schools can be excellent places for community gardens. Teachers can be trained with general knowledge of sustainable practices, such as planting flowers together with vegetable crops to increase biodiversity. A recent study by the University of Texas, Austin shows that biodiversity brings pollinators, and more pollinators leads to more food. A diversity of floral forage with a variety of blooming phenologies should be encouraged in both management types to ensure consistent nectar and pollen resources are available throughout the blooming season.[13] Providing communities with environmental education such as understanding that bees as pollinators need a variety of floral forage is vital. Suburban agriculture and community gardens can add to the diversity that helps pollinator populations thrive. Depave Portland, based in Portland, Oregon, advocates for removing asphalt and promoting gardens and green spaces in communities.[14] They educate about how asphalt raises urban temperatures and how removal of pavement gives access to land for plants and trees. They note that when the reclaimed land is used for farming, it provides food and nutrition to the residents (Figure 1). Recent projects like the school gardens involve the community in every step. These gardens serve as educational hubs, teaching about environmental topics beyond just gardening.

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[12] Margot I. Jackson, "Early childhood WIC participation, cognitive development and academic achievement," *Social Science & Medicine* 146 (2015):145-153, https://doi.org/10.1016/j.socscimed.2014.12.018.
[13] Kimberly M. Ballare, et al., "Multi-scalar drivers of biodiversity: local management mediates wild bee community response to regional urbanization," *Ecological Applications* 29, no. 3 (March 2019): e01869. https://doi.org/10.1002/eap.1869.
[14] "Depave," Depave Portland, accessed November 15, 2023, https://depave.org/.

Benefits of Urban Vegetation
• Cooling of homes and offices by shading the sun's rays and the protection against harsh winds. • Ambient cooling from evapotranspiration of rain on the leaves. • Aesthetic enhancement to areas and psychosocial benefits associated with greenery. • Enhancing air quality by removing particulate pollutants and carbon dioxide from the air while producing oxygen. • Visual privacy and reduction of noise from the street. • Traffic calming when trees are planted along urban streets. • Restoration of local habitat for birds, insects, and other wildlife. • And if the previously paved land is used for farming, this provides food and nutrition for local residents.

Figure 1. Depave Portland. "Depave." Accessed November 15, 2023. https://depave.org/.

In addition, sustainable waste practices and responsible stewardship of resources are another important consideration. With the rise of processed foods there comes a considerable amount of waste. The waste cycle begins at the point of production and continues until the item is removed from the package to be consumed. For instance, when opening a bag of potato chips, few consider the potatoes wasted during production or the plastic used for packaging. The product life cycle is complicated at best (Figure 2).[15] Researchers looked at the water-energy-food-climate nexus to analyze the environmental impacts and nutritional quality of artisanal potato chips. They identified ways for the environmental impacts to be reduced, namely by producing the product locally and encouraging consumers to only be consuming them

[15] Ana Fernández-Ríos, et al., "Water–Energy–Food Nexus and Life Cycle Thinking: A New Approach to Environmental and Nutritional Assessment of Potato Chips," *Foods* 11, no. 7 (2022): 1018, https://doi-org.proxy.lib.pdx.edu/10.3390/foods11071018.

occasionally. Similarly, Americans consume 6.6 pounds of potato chips annually, and the water-energy-food-climate nexus is likely the same.[16] It is imperative that consumers begin to be mindful not only about what they eat, but also its origins and production methods. Consumers can influence how food is produced, and companies know this.

Industry Process of Potato Chips Manufacturing

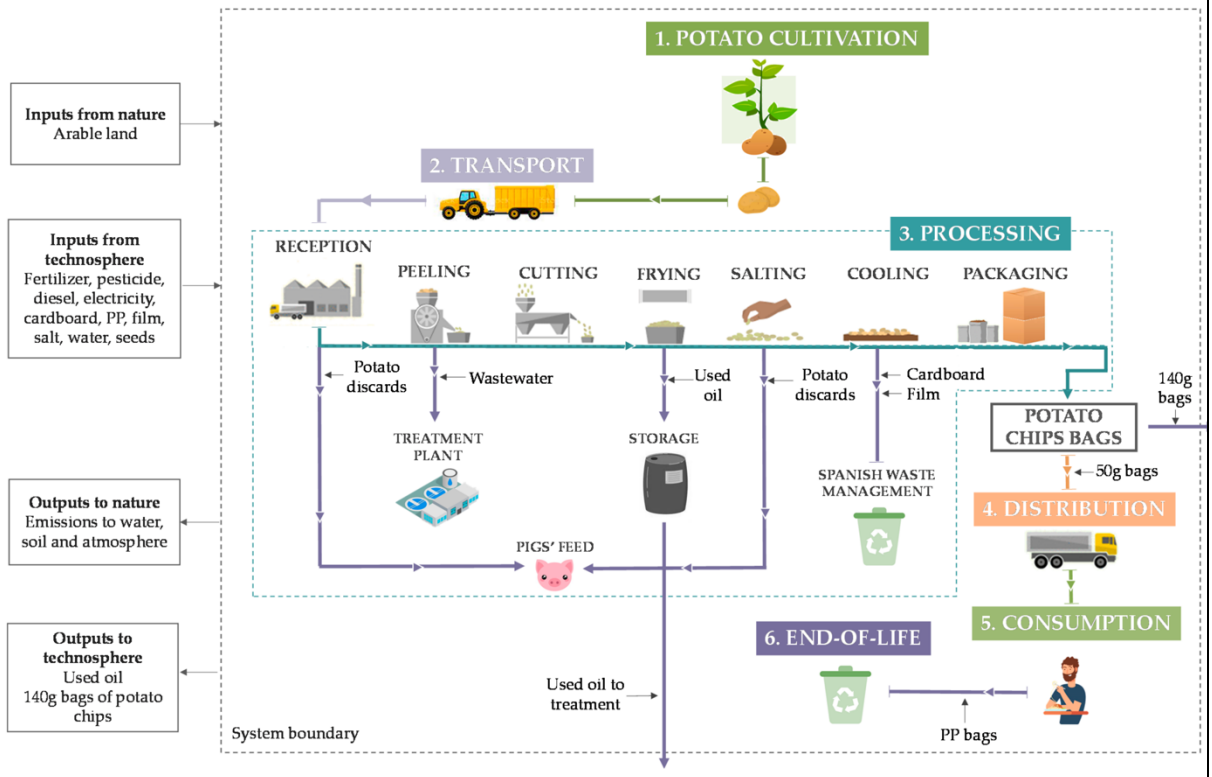

Figure. 2. Fernández-Ríos, Ana, Jara Laso, Francisco José Amo-Setién, Rebeca Abajas-Bustillo, Carmen Ortego-Mate, Pere Fullana-i-Palmer, Alba Bala, et al. "Water–Energy–Food Nexus and Life Cycle Thinking: A New Approach to Environmental and Nutritional Assessment of Potato Chips" *Foods* 11, no. 7 (2022): 1018. https://doi-org.proxy.lib.pdx.edu/10.3390/foods11071018.

[16] "U.S. Population: Do you eat potato chips?" Statistica, accessed April 20, 2024, https://www.statista.com/statistics/277158/us-households-consumption-of-potato-chips/.

Globally, researchers are examining consumer impact and trends. A study from the Philippines indicates that middle-class food consumption practices in metro Manila put a high pressure on the environment, particularly in relation to meat and dairy products, processed and imported food, and beverages, specifically bottled water.[17] This highlights that what we do as consumers matters to the health of the environment. Citizens can recycle, compost, cook at home, look for minimal packaging, reuse items like glass bottles, and more. In Portland, Oregon, Metro is a local government agency that collaborates with groups like NAYA and Depave to make Portland a better place to live.[18] Food security is one of the aspects that enhances community.

Food Security

Communal gardens can play a role in access to high-quality food and remedy some of the inequities surrounding food access. Yet, urban agriculture alone cannot fully resolve many of the fundamental causes of food *injustice*, which include economic disparities, poverty, and historical and structural racism. Worse, some urban agriculture projects may perpetuate existing inequities, for example by benefitting already privileged communities and contributing to the ongoing marginalization and even displacement of disadvantaged groups.[19] There is no perfect solution, but empowering people to grow food is a way to combat some inequities like food insecurity and food access issues as cities plan for the future.

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[17] Laura Burger Chakraborty, et al. "Urban Food Consumption in Metro Manila: Interdisciplinary Approaches Towards Apprehending Practices, Patterns, and Impacts," *Journal of Industrial Ecology* 20, no. 3 (February 2016): 559–570. https://doi.org/10.1111/jiec.12402.

[18] "Metro," Oregon Metro, accessed April 20, 2024. https://www.oregonmetro.gov/.

[19] Horst, McClintock, and Hoey, "The Intersection of Planning, Urban Agriculture, and Food Justice."

When healthy food is harder to access conveniently and locally, consumers will opt for the easy choice, despite knowing what they should eat. Barriers like access and affordability make healthy eating challenging. Do you eat what you can get and risk future health issues or do you sacrifice time and money to try to prioritize health? Whole unprocessed foods are often better choices but are being pushed out of favor by affordable processed foods, like those provided in food pantries. According to Algert et al., "Food-insecure families and individuals often rely on neighborhood food pantries for emergency food assistance. Food pantries focus on providing only short-term food assistance and do not carry all types of products, particularly perishable food."[20] When people can't access healthy fresh food, they won't eat it. The ability to find and prepare fresh food impacts daily choices.

Community gardens can play an important role in underserved communities. However, chances are that the people who need the community gardens the most will have the least amount of access. Counter to expectations was that food security was consistently higher among community gardeners, as one study highly suggested food-insecure participants were less likely to be involved in community gardens.[21] Efforts are being made to remedy this problem in marginalized communities. Growing Gardens is a nonprofit in Portland, Oregon that promotes community garden programs.[22] They state: "Our food system produces enough food to feed everyone. Yet 1 in 7 Oregonians go to bed hungry. According to recent reports, a staggering 80% of those affected are directly involved in local food production. They are farmers, fishermen, and factory workers—*many of them people of color* [emphasis in original]—and they are

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[20] Susan J. Algert, Aditya Agrawal, and Douglas S. Lewis, "Disparities in Access to Fresh Produce in Low-Income Neighborhoods in Los Angeles," *American Journal of Preventive Medicine* 30, no. 5 (2006): 365-370 https://doi.org/10.1016/j.amepre.2006.01.009.

[21] Clare, Hume, et al., "Community gardens and their effects on diet, health, psychosocial and community outcomes: a systematic review," *BMC Public Health* 22, no.1247 (June 2022). https://doi.org/10.1186/s12889-022-13591-1.

[22] "Growing Gardens," Growing Gardens, accessed May 17, 2024, https://www.growing-gardens.org/.

often unable to access the same food they grow, harvest, prepare, and distribute."[23] The organization works with home gardeners and school communities, providing garden beds, seeds, and supplies along with guidance from advisors to train new gardeners. Growing Gardens seeks to dismantle barriers by providing ongoing support to participants of the programs, including virtual consultations to help gardeners. The Youth Grow Program offers students opportunities, including nutritional information, teen internships, and after-school/summer educational programs, ultimately benefitting their families as well. They are partnered with twelve Portland public schools to cultivate change by growing gardens. Sustainable change is often made at these types of grass-root levels. To conclude, food security and access will remain important points of consideration for future food production in city settings. Addressing social equity issues should be part of the planning processes to ensure citizens can gain and sustain access to healthy foods.

Conclusion

This paper has explored the meaningful roles that school and community gardens can play in helping to provision the 21st Century City. Creating civic engagement can have an impact on having informed and motivated citizens that will be part of the solutions of how we will feed ourselves. It will be imperative that cities have food strategies in place for food systems because an urban workforce must eat to provide for the future. Working systems that utilize resources wisely will be the keys to success. Building sustainable systems will require environmental education of current citizens and the next generation. Community gardens provide spaces where people can learn about sustainable practices they can implement in their

[23] Growing Gardens, "Growing Gardens."

communities and maybe in their own backyards and spaces. While most urban plots are small compared to commercial farm acreage, a large amount of food can be grown, with greater diversity and more nutrition. Community gardens offer considerable environmental education opportunities, can help to heal climate change, and reduce the carbon footprint created by foods being imported long distances. Communal garden spaces deserve a place in the conversation of urban food sustainability in the future. Community gardens foster a place for civic engagement and environmental education opportunities that promote building equitable food security for their members. Provisioning the 21st Century City will be a collective effort, starting with one community garden and one neighborhood at a time.

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