

The Role of Urban Agriculture in the Food Access Crisis

Thesis

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Abstract

The world is producing more food than ever before, yet many people still suffer from food insecurity. This paper examines the effect of urban agriculture on food insecurity and food access. Low food access can lead to a variety of health problems, both physical and mental. The globalized food system and disruptions in the supply chain related to COVID-19 have only exacerbated food insecurity. Finding a solution that ensures food security will be crucial with a rapidly growing population. Researchers have promoted urban agriculture as a way to alleviate food insecurity and increase food access. This paper finds the most significant benefits of urban agriculture to be the ability to provide local and healthy food, creating robust food systems, and empowering communities. Yet, these benefits are not always present in communities that utilize urban agriculture. The movement tends to be socially exclusive and is not accessible for all to participate in, therefore reducing its effectiveness at increasing food access. To fully reap the benefits of urban agriculture, it must become more accessible for all to participate. Municipalities should utilize food policy councils to address institutionalized inequities in the food system. The government has a responsibility of ensuring that everybody has equal access to healthy food by helping provide accessible information on urban agriculture and its policies. Subsidized programs like CO-CSAs should become

commonplace to help low-income families become a part of urban agriculture. Urban agriculture can increase food access in certain areas if utilized correctly. On its own, urban agriculture will not solve the food access crisis, but can be used as a tool alongside other efforts.

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Introduction

Urban Agriculture (UA) has the potential to increase food access and provide substantial benefits to the environment (Pawlowski, 2018). This extensive literature review will examine to what extent UA has a role in increasing food access and food security. UA is present in many cities across the United States, with many hosting farmers' markets that provide high quality and local food. Yet, just because a farmers' market is present in an area does not mean that all who reside there will have access to it. This paper will examine both the benefits and the struggles of UA. Understanding what is currently working to benefit certain communities will help other communities do the same. This literature review will analyze municipal policies, the global food system, existing frameworks, and quantitative and qualitative data on food access. Addressing the challenges with UA will help new policies incorporate shortcomings that are present. Every human being should have access to affordable, safe, healthy, and sustainable food options. This paper will synthesize the available literature to help foster new solutions to the food access crisis.

The History of Urban Agriculture

UA has been around for a very long time. Historically, most people used to engage with some sort of agricultural activity daily. With the rise of densely populated cities and a globalized food system, people have become disconnected from their food

and where it comes from. Conventionally grown food travels on average around 1,500 miles until it reaches the supermarket (Wakeland et al., 2011). The United States has a highly urbanized population at 82%, compared to the global average of 56% (World Bank, 2019). The world is producing more food than ever, and with the Green Revolution in the 1950s, the crop yield has increased by 50% (Evenson & Gollin, 2003). The Green Revolution integrated the use of pesticides, herbicides, technological and scientific advancements, and better farming practices. Though there is more food than ever before, there are still 1 in 7 people on Earth who do not have sufficient access to food (Godfray et al., 2010). There are many reasons why certain people may not have access to food. This literature review will focus on how policy, distribution, and supply chains can affect food access. When there has been a disruption in the supply chain, UA has helped fill the gaps to promote food security (Pawlowski, 2018).

Food Access, Food Justice and Food Security

The Congressional Research Service (2021) defines food deserts as low-income and low-access. Low-income areas are defined as 20% or more of the population facing poverty. Low-access is living farther than one mile from a supermarket or grocery store (in a city) or over 10 miles (in a rural area) (CRS, 2021). The USDA recognizes that there are many ways to define food access; this can cause ambiguity when researchers try to gather quantitative data regarding UA. Because of this, much of the data presented in this review consists of qualitative data, providing helpful information that will help point future research in the right direction. Researchers must agree upon specific criteria to

base their studies upon if they want to gather salient quantitative data that can be used to prove the statistical significance of the effects of UA.

With UA present in the community, it can help provide healthy, local, and sustainable food options. The only places to obtain food in a food desert area are usually fast-food restaurants and convenience stores. These both provide only processed, calorie-dense, and nutrient-poor food options. Convenience stores have prices 10%-54% more expensive than supermarket prices (Appendix B) (Caspi et al., 2017). Without supermarket availability, people are forced to shop at overpriced convenience stores. The cheapest food available usually consists of heavily processed grains and added sugars and fats. This type of food tends to be of poor quality and less expensive per calorie than healthier alternatives (Drewnowski & Darmon, 2005). Finding a way to increase access to healthier and more sustainable food alternatives is crucial. Food justice ensures that each individual has access to healthy food; the goal is to eliminate disparities and inequities within the food system.

When somebody is food insecure, their diet is reduced in quality, variety, and desirability (O'Hara & Toussaint, 2021). People who lack food access are usually food insecure. A large portion of literature examined uses food insecure households in their research, especially those with children. Looking towards children helps find the most helpful information because they are often the ones most affected by the change and will grow into the next generation. Children also face the most severe impacts related to food insecurity (Brown et al., 2015).

In 2020, 10.5% of households were food insecure, with large cities having higher rates of food insecurity (USDA, 2021). Figure 1 shows that the groups most affected by food insecurity are households with an income below the poverty line at 35.3%, single mothers at 27.5%, and Black households at 21.5% (USDA, 2021). A study on food security of undergraduate university students also found that 23.5% of students considered themselves food insecure (Forman et al., 2018).

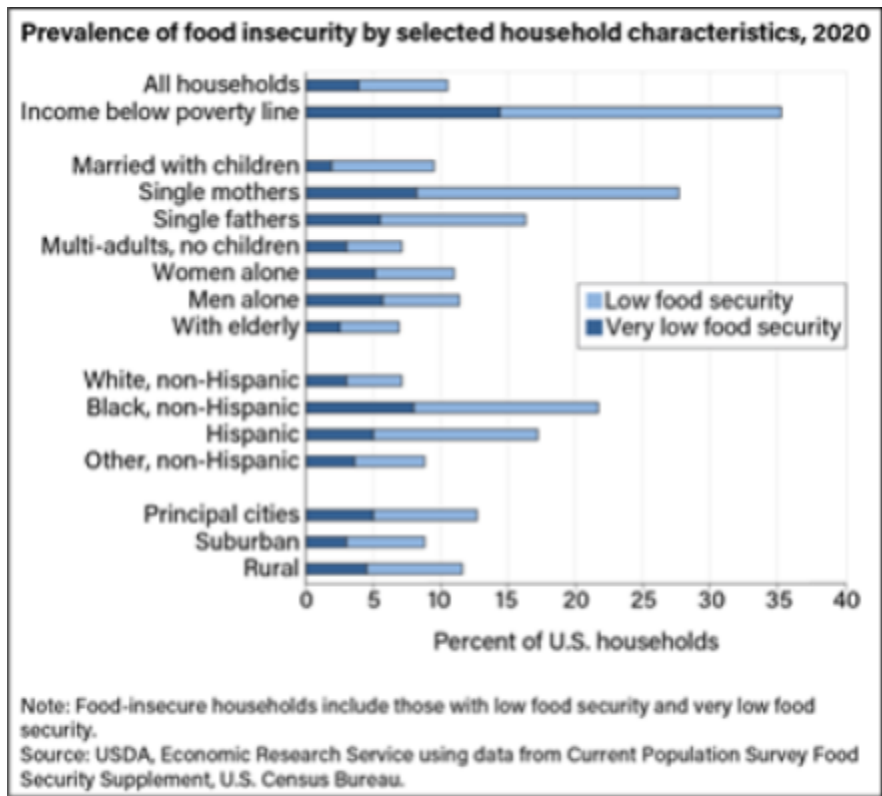


Figure 1: Prevalence of food insecurity by selected household characteristics (USDA, 2021)

Global Food System

The global food system has contributed to these inequities by underpaying workers, misleading consumers, and mainly providing ultra-processed food (Patel, 2012). This paper will analyze how UA has the potential to alleviate the reliance on the global food system by promoting local agriculture that is more sustainable and provides an economic benefit for the community (Halvey et al., 2021). When communities are independent of the global food system, they can provide for themselves in the case of disruptions in the supply chain that are out of their control. COVID-19 has demonstrated the fragility of the global supply chain; shortages are becoming more frequent, and food access has become scarcer. In some cases, communities can utilize UA by growing their own food. O’Hara and Toussaint (2021) recognize the need for a more decentralized food system in a post-pandemic world.

Health Implications Due to Low Food Access

Low food access can lead to a wide array of health problems, with the most obvious ones being hunger and obesity. It may seem paradoxical for those with low food access to suffer from obesity. Żukiewicz-Sobczak et al. (2014) acknowledge that the low cost and accessibility of highly processed food pushes people to eat food with little nutritional value and ‘empty calories’, making them more likely to become obese. Other illnesses include chronic diseases, such as hypertension, hyperlipidemia, and diabetes (Drewnowski & Darmon, 2005). These health effects can be exacerbated in children, who

can suffer from “increased rates of iron-deficiency anemia, acute infection, chronic illness, and developmental and mental health problems” (Seligman et al., 2009). Children of low-income families are more likely to be obese and have type 2 diabetes due to poor food access (Seguin et al., 2017). When there is low access to food, the cheapest and most available options include unhealthy foods that cause disease and illness. In the United States, from 2003-2007, the prevalence of obesity in children of low-income families increased by 23-33%, whereas the overall increase for US children was only 10% (Rogers et al., 2015). Improving food access can help alleviate stress on the population’s overall health.

Results

Benefits of Urban Agriculture

UA has the potential to decrease food deserts by providing local, sustainable, and healthy food options. After the recession in 2008, there was a spike in the number of UA projects (Pawlowski, 2018). Many communities found that taking food production into their own hands was something they had to do to keep food on the table. The benefits of UA include an increase in green spaces, improved mental and physical health, climate change mitigation, stimulation of the local economy, and community building and empowerment (Siegener et al., 2018). Pawlowski (2018) states that UA can create robust food systems, increase neighborhood safety, decrease crime, boost community morale, and stimulate population growth in depressed areas. UA can help provide opportunities for communities to host farmers' markets, where people can come to buy fresh and healthy food. Some of these farmers' markets offer options for low-income households by accepting supplemental nutrition assistance program (SNAP) and electronic benefit transfer (EBT). 40% of farmers' markets nationally accept SNAP benefits (Kellegrew et al., 2018).

UA projects are not always large-scale, it can also look like a simple backyard garden. In some cases, those who are facing food insecurity can supplement gaps in their diet with a home garden. Siegener et al. (2018) found that individuals with access to a 10'

by 20' plot community garden, or their own backyard garden could save \$240-\$720 on groceries each year. Siegner et al. (2018) mention that this is not available to everyone but can be a part of the myriad of solutions.

With globalization, communities have become increasingly reliant on the global food system. Since the COVID-19 pandemic started in 2020, the global supply chain has shown signs of fragility. O'Hara & Toussaint (2021) found in their study that 13% of households in Washington D.C. were food insecure, higher than the national average of 10.5% recorded in 2020 (USDA, 2021) before COVID-19 had a chance to wreak havoc on the supply chain. They note that food insecurity has increased with COVID-19, while at the same time, food insecurity increases the adverse effects from COVID-19 (O'Hara & Toussaint, 2021). The food insecurity increase is assumed to come from both income loss and supply chain issues, both symptoms of COVID-19. The unemployment rate in Washington D.C. in November 2020 increased 2.2% compared to November 2019 (DES, 2020). The pandemic has made it evident that there is a need for “decentralized, localized, and culturally resonant food systems” (O'Hara & Toussaint, 2021). UA can be used as a tool to help communities decrease their reliance on the fragile global supply chain.

COVID-19 is not the only entity threatening the global food supply. Climate change impacts on global food security have already become evident and scientists predict that these effects will grow worse in the future (Brown et al., 2015). The climate will change all over the world, including increased precipitation intensity, dry spells, an

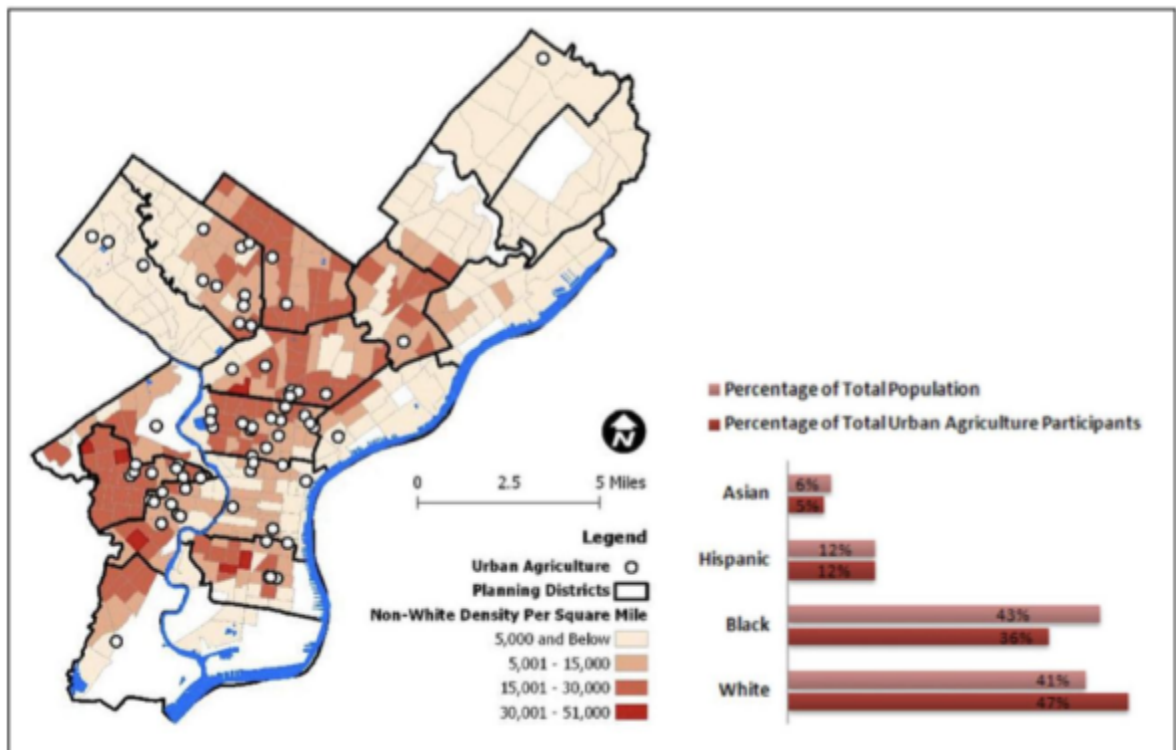
increase in temperature overall (predicted to get colder in some areas as well), and sea-level rise. Agricultural systems globally will struggle to adapt to a rapidly changing climate, especially where one crop has been historically grown and can no longer be. Climate change threatens food security primarily for poor populations and those who reside in tropical locations. (Brown et al., 2015). Climate change will most likely drive up food prices due to food shortages. UA's decentralized and localized food system can help communities become independent from the global food system that could collapse due to a changing climate. Yet, every community can't utilize UA, which the next section will address.

Challenges of Urban Agriculture

Just as there are many benefits associated with UA, there are also some drawbacks. The benefits of UA are not evenly distributed among the people. UA is not accessible for everybody, with there being some social exclusion in the movement due to economic, informational, and geographic inaccessibility (Meenar & Hoover, 2012). Promoting UA projects to the community has been difficult due to a lack of access to municipal programs and an absence of assistance with farming practices (Cohen & Reynolds, 2014). Not everybody has access to land and financial capital; in some areas, it can cost \$16,000 to get a location rezoned for UA purposes (Hammelman, 2019). Those who do not have land of their own for UA projects have difficulty gaining access to public land to practice UA. Hammelman (2019) did a study in Toronto; they found that those without the financial means, scientific expertise, and influence on municipal policy

have severe difficulty accessing public lands for growing spaces. The UA policy in Toronto failed due to their focus being solely on the number of growing spaces rather than addressing the uneven access to growing spaces (Hammelman, 2019).

Meenar and Hoover (2012) conducted a study in Philadelphia to examine how UA can relieve food insecurity in low-income neighborhoods. In Figure 2, Meenar and



Data sources: U.S. Census; City of Philadelphia; survey by authors.

Figure 2: Comparison of the Racial Profiles of City Residents and UA participants (Meenar & Hoover, 2012)

Hoover (2012) found that those who participated in UA projects were more often White in a predominantly Black neighborhood. UA projects consisted of 36% Black and 47% White participants, while census demographics for the area were 43% Black and 41%

White. (Meenar & Hoover, 2012). In their interview process, a UA organizer stated that “The people who are doing [urban farming] are mostly 20- to 30- something White kids who are farming these little communities... There are no older people there, they are all young people and they are all White... [Urban farming] is still a White, top-down activity” (Meenar & Hoover, 2012). The organizers interviewed believe that the Black community voluntarily excludes themselves, noting that the practice of farming has produced comments on race and slavery. Teenagers state, “Oh look, we’re out in the fields again.’... You just don’t find many African Americans who can be farmers in the city” (Meenar & Hoover, 2012).

Informational access is another challenge of UA. UA projects often use the internet to communicate with members, at 76% (Meenar & Hoover, 2012). The low-income and the elderly community lack sufficient access to the internet, making them less likely to engage in UA projects (Meenar & Hoover, 2012). Figure 3 demonstrates the number of UA projects that are located in areas

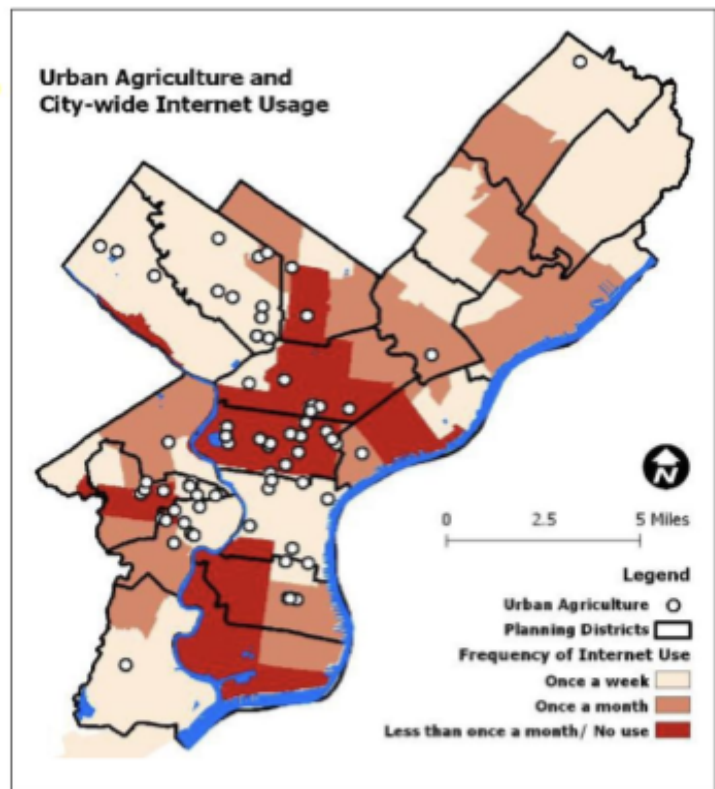


Figure 3: UA and City-wide Internet Usage in Philadelphia (Meenar & Hoover, 2012)

lacking sufficient access to the internet. Though it can be great that the UA projects are located in low-income neighborhoods, it can't help the community if the residents don't know the projects exist.

When land is designated for agricultural use, there is the possibility of conflicting with other social justice priorities. New UA land could take away from the new low-income housing projects and contribute to gentrification (Siegener et al., 2018). In large urban areas that face overpopulation and high housing prices, rezoning land for UA may not be in the community's best interest.

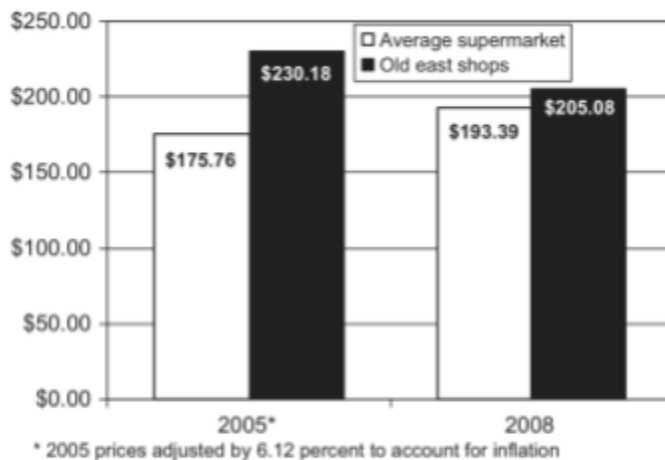
Table 1 summarizes the benefits and the challenges of UA. With the data available, a lot of these are just potential benefits and challenges. With the lack of quantitative data on UA, it is hard to prove the significance and show evidence of a particular benefit or challenge. With more research, these results should become more salient.

Benefits of UA	Challenges of UA
<ul style="list-style-type: none"> ● Provides local, healthy, and sustainable food options 	<ul style="list-style-type: none"> ● Benefits of UA are not evenly distributed amongst the people, social exclusion
<ul style="list-style-type: none"> ● Alleviates reliance on the global food system, creates robust food systems 	<ul style="list-style-type: none"> ● Economic, informational, and geographic inaccessibility to be a part of UA movement
<ul style="list-style-type: none"> ● Increase in green spaces 	<ul style="list-style-type: none"> ● Lack of access to municipal programs, lack of assistance with farming practices
<ul style="list-style-type: none"> ● Improved mental and physical wellbeing 	<ul style="list-style-type: none"> ● UA land can be expensive - to buy or to have public land be rezoned for UA purposes
<ul style="list-style-type: none"> ● Climate change mitigation 	<ul style="list-style-type: none"> ● Low access to public growing spaces
<ul style="list-style-type: none"> ● Stimulates the local economy 	<ul style="list-style-type: none"> ● Farmers' markets and CSAs are costly to participate in
<ul style="list-style-type: none"> ● Empowers communities, community building, boost community morale 	<ul style="list-style-type: none"> ● Farmers' markets are only open for small windows of time
<ul style="list-style-type: none"> ● Increase in neighborhood safety, decreases crime 	<ul style="list-style-type: none"> ● Many cities lack sufficient policies that address UA
<ul style="list-style-type: none"> ● Many farmers' markets accept SNAP/EBT benefits 	<ul style="list-style-type: none"> ● UA can contribute to gentrification
<ul style="list-style-type: none"> ● Cost-offset CSAs can be utilized to help low-income families gain access to food 	<ul style="list-style-type: none"> ● Overall lack accessibility to UA, especially in marginalized communities
	<p>Table 1: The Benefits and Challenges of UA</p>

Farmers' Markets

The products of UA are typically sold at either farmers' markets or within community supported agriculture (CSA). A critique of UA is that farmers' markets and CSAs are too costly to participate in. Even with farmers' markets and CSAs present in a community, those who suffer from low food access most likely do not have the financial means to participate. CSAs have members who are shareholders of a farm or multiple farms' harvest. Membership fees can often be high for CSAs, making those with low food access less likely to be a part of one.

Larsen & Gilliland (2009) did a study in Ontario, Canada evaluating the impact of new farmers' markets placed in historical food desert areas. The area examined did not have any supermarkets present; the supermarkets that were accessible could only be reached by car or public transit. 54% of residents did not have a private vehicle nor had sufficient access to public transit (Larsen & Gilliland, 2009). They used the term "Ontario Nutritious Food Basket" (ONFB) to evaluate the food prices of supermarkets, local



convenience stores (Old East Shops), and the new farmers' market. ONFB consists of 66 items from the four major food groups. Table 2 demonstrates that introducing a farmers' market in a food desert area lowers

Table 2: Change in price of a healthy food basket from 2005-2008 (Larsen & Gilliland, 2009).

supermarket and Old East shop's prices. Though the prices at supermarkets and local convenience stores dropped, residents were on average paying 5.7% more at farmers' markets than at supermarkets (Larsen & Gilliland, 2009). Another drawback is that this farmers' market, like many others, is only open for a brief period (Saturdays from 7 am-3 pm). Though the introduction of farmers' markets had an overall positive impact on food prices, low-income individuals who live in food deserts aren't likely to spend the little money they have at a farmers' market that is more expensive than a supermarket.

SNAP/EBT & CO-CSA

SNAP is a governmental assistance program previously known as "food stamps." EBT cards can be used to transfer the SNAP benefits from the government to the cardholder. SNAP is available for low-income individuals and families, especially those with children, the elderly, and disabled house members. SNAP was designed to decrease food insecurity in America and promote healthier eating habits. As previously mentioned, a little less than half of the farmers' markets accept SNAP (Kellegrew et al., 2018). Kellegrew et al. (2018) did a study to examine the barriers behind the acceptance of SNAP in farmers' markets. Though the data didn't find any statistical significance, the authors note that when farmers' markets accept SNAP, it can help increase food access to underserved communities (Kellegrew et al., 2018).

Cost-offset community supported agriculture (CO-CSAs) are a way to improve access to CSAs for low-income households. CO-CSAs are a subsidized program that provides flexible payment schedules and discounted CSA prices (Hanson et al., 2017).

Participating in a CSA is often infeasible for low-income households due to higher prices for fresh, local, and healthy food. Hanson et al. (2017) did a study to examine if CO-CSA participants had higher fruit and vegetable intake (FVI) than non CO-CSA participants. CO-CSA participants had a total FVI greater than the average US FVI. Hanson et al. (2017) does mention that even with this data, they can not assume causality due to positive deviants. CO-CSA participants have uncommon practices (seeking out CO-CSAs) that could help enable them to achieve higher FVI outcomes.

Urban Agriculture Policy

Municipal UA policy plays a role in whether UA can increase food access for its residents. Many large cities have food policy councils (FPCs) that act as advocacy groups for municipal food policy, with some governmental and other non-governmental. Yet, some cities lack sufficient policies to address UA goals. Halvey et al. (2021) examined 40 of the largest cities in the United States to propose a framework for developing the most useful municipal UA policies. Figure B1 (Appendix B) addresses the UA topics researched in the study; the most relevant to this literature review consists of land use, education, food sales, public land access, and tax assessment. Figure B1 also shows the different entities and programs involved in the policymaking process (Halvey et al., 2021). When Halvey et al. (2021) conducted this research, they found locating the policies themselves to be challenging, after noting that it would be difficult for a UA practitioner to find information on the topic. It is essential to understand that non-governmental entities can have a lot of influence on policymaking. UA policies can

leave underrepresented community members out of the conversation; UA projects led by low-income and people of color (POC) members tend to suffer from a lack of funding, land access, and political support comparatively (Cohen & Reynolds, 2014).

Discussion

It is challenging to have a definitive answer to whether or not UA can increase food access and security. A lot of the literature presented is theoretical, including some wishful thinking at times. UA will not be a fix-all solution to the food access crisis. Most of the literature cites a need for better municipal policy in regards to UA. Yet, they also recognize that not every community will be the same in its policy needs. This section will address the shortcomings of UA and help find ways to increase UA's ability to improve food security, food access, and food justice.

Urban Agriculture and its Policy Needs

UA cannot be the only solution to food insecurity. Siegner et al. (2018) state that placing the responsibility on UA can dissolve the government's commitment to ensure community food security. The low-income community might have a hard time finding the time, money, land, and knowledge to utilize UA. To fully reap the benefits of UA, external support must be given to bolster the movement. UA can and will be a part of the fight to obtain community food security for all, but it will not be able to do it alone.

When Cohen & Reynolds (2014) examined New York City's existing UA policies, they found that they often fell short of their goals. They recognize that UA policy needs to address institutionalized inequities, promote networking among UA practitioners, and create a UA plan and advisory board (Cohen & Reynolds, 2014). They

also note that the policymaking needs to utilize both governmental and non-governmental stakeholders; when a diverse range of voices help create UA policy, its goals of strengthening the system's economic, environmental, and social integrity overall could be reached (Cohen & Reynolds, 2014).

Some researchers focused on creating a framework that could help policymakers create better UA policies for their constituents. This framework promotes broadening community participation; with increasing influence from non-governmental entities, it is crucial to ensure the leaders of advocacy groups are inclusive. The POC community members suffer the most from low food access and are often left out of the UA policymaking process. Though many realize that there is not one UA policy that would work for every city, it is possible to develop a set of guidelines that will serve each community in the best way possible. Many local governments are not equipped to draft adequate food policies. Many departments often create these policies without much expertise (Halvey et al., 2021). Utilizing the local FPCs who provide policy solutions is an excellent way for municipalities to get help drafting their policies.

Critiques of Urban Agriculture and Food Access Studies

UA does have the potential to do all of these great things, but the word “potential” must be reiterated. Some studies mentioned in this literature review failed to mention that even if UA can enact positive change, it does not mean that it will happen. Halvey et al. (2021) state benefits to the economy from UA, yet there is not sufficient evidence to back that up. Most UA projects survive by utilizing volunteers; in most cases, UA farmers are

not making a living off of their farms. UA is usually utilized for passion projects. Those who don't know where their next meal is coming from will probably not spend their free time farming unless they have a significant passion for agriculture.

The acceptance of SNAP/EBT has been applauded as a way to increase access to locally grown food. Yet, it must be understood that oftentimes those who rely on SNAP/EBT are most likely not going to spend the little money they have on highly-priced urban grown foods. It seems like wishful thinking to believe that the acceptance of SNAP/EBT would make a difference in increasing food access. When Larimore (2017) examined farmers' markets that accepted SNAP/EBT, they found that some markets didn't even have one customer who used SNAP/EBT during the study. An assumption can be made that SNAP/EBT acceptance may not be the best way to increase food access. A better way to boost food access to those who are eligible for SNAP/EBT would be to have them establish their own backyard garden or become involved in a community garden where they could offer up their free time in exchange for portions of the harvest.

Accessibility of Urban Agriculture

Accessibility is a key aspect for UA to affect food access positively. UA policies are hard to find, making it difficult for a UA practitioner to thrive (Halvey et al., 2021). The community needs to know about UA, farmers' markets, CSAs, etc., to participate and gain better food access. Implementing policies that ensure everybody has internet access or phone connectivity can help UA meet its goals.

An easy way to implement UA education would be to utilize the public education system. Ensuring that public school children have access to a community garden where they can come to learn about how to grow their own food will help empower them to utilize UA later on in life. Not only will the children gain invaluable experience and knowledge, but the school can also use the harvest to provide lunches for the children. Unfortunately, it is common for low-income children to get their only meal of the day at school. Providing a space for children to learn can help raise their chances of participating in UA activities in the future.

Civic engagement is a great way to ensure everybody's voices can be heard. Civic engagement looks like residents participating in local organizations, contacting representatives to stress the importance of UA, and participating in FPCs. UA is extremely dominated by the White community (Ramirez, 2014). The African-American and Latino communities are less likely to participate in UA than others (Siegener et al., 2018); the negative association with farm labor and people of color causes a low desire to participate in such activities. There are currently organizations that are attempting to address this issue, such as Clean Greens out of Seattle, Washington. Clean Greens is a Black-led UA project that prioritizes providing a safe space for its Black participants. The leaders of Clean Greens understand that the Black community will be more likely to participate when they are surrounded by other Black participants (Ramirez, 2014). Though Clean Greens and other organizations like it are trying to address the inequities with UA, they are struggling to bring in more Black participants into their project,

specifically the Black youth. Many UA projects, even white-led, attempt to create an inclusive environment that provides a space for everyone. Yet, the historical trauma around farming is too much to bear for them to participate.

“The people of this community support the farm, but there is a disconnect when it comes to actually being in the dirt, planting seeds, harvesting crops. And that disconnect comes as a result of the historical problem in our community. A lot of the people who we deal with come from the south. The younger people do not come from the south but their grandmothers and their mothers came from the south, and they told these kids all the horror stories. These are collective memories about a horror that people went through, and this horror, unfortunately, is connected to the land and to the earth ... I’ve seen people cringe about the thought of getting on their knees in the dirt and planting a seed. People telling us they would never do that, they would help out in any way that they can but they would never be out in the field (quoted in Dohrn 2011)” (Ramirez, 2014).

Attempting to address systemic racism would be out of the reach of this paper.

Yet, the best way to increase the civic engagement of the POC community will be by the continuous work that Black-led UA organizations are already doing. The policymaking process must include all voices. Ensuring safe spaces for POC community members in UA projects will be crucial to increasing inclusivity in UA.

UA on its own will not simply increase food access. The simple definition of food access from the USDA is mentioned earlier, yet that should not be the only criteria to look for when attempting to increase food access. When conducting more research on how UA can alleviate food insecurity, the definition of food access should include

“educational, cultural, geographic, and economic dimensions” (Siegnner et al., 2018).

Agreement upon specific statistical measurements on these dimensions is crucial to help foster quantitative data for UA that is currently lacking. Evidence (Siengner et al., 2018) shows that the cultural acceptability of foods plays a role in increasing food access.

Ensuring that UA provides a culturally resonant food system is a way to ensure that there is less social exclusion in the UA movement. In a country like the United States, people have very different diets. UA must include the food desires of all cultures to increase inclusivity in the movement. It is not as simple as just growing food.

UA must be complemented by other policies and supported by the government. Addressing the structural causes of food insecurity will help ensure better food access. Globalization of the food system was mentioned in this literature review but addressing all of the systemic inequities that enforce low food security is out of the reach of this paper. UA, alongside the implementation of farm to school programs, nutrition education, civic engagement, internet and phone connectivity for all, agreement on statistical measurements of food access, will be a step forward in increasing food security. To ensure that UA projects don't have a negative impact on the community through gentrification, alliances amongst the housing and transportation sector alongside food policy will be necessary. Urban agriculture might not cure hunger and poverty in urban areas, but it is a substantial step in the right direction.

There have been many issues and challenges with UA that have been addressed in this paper. Yet, many challenges can be solved in one way or another. Table 3 shows a

variety of solutions to the challenges of UA discussed in this paper. There may be many problems currently with UA, but that does not mean these cannot be addressed head on.

Challenges of UA	Solutions to the Challenges of UA
<ul style="list-style-type: none"> • Benefits of UA are not evenly distributed amongst the people, social exclusion 	<ul style="list-style-type: none"> • Policy can address institutionalized inequities Make UA more accessible for all people to participate by utilizing a diverse range of voices
<ul style="list-style-type: none"> • Economic, informational, and geographic inaccessibility to be a part of UA movement 	<ul style="list-style-type: none"> • Prioritize education, no membership fees to be a part of UA projects (or subsidized fees) Municipalities can ensure internet and phone connectivity for constituents
<ul style="list-style-type: none"> • Lack of access to municipal programs, lack of assistance with farming practices 	<ul style="list-style-type: none"> • Ensure that information on UA, including UA policies, is easy to find Educational programs on UA skills can be held, especially at schools
<ul style="list-style-type: none"> • UA land can be expensive - to buy or to have public land be rezoned for UA purposes 	<ul style="list-style-type: none"> • UA projects should be allowed to use underutilized land; UA projects will better the area in most cases.
<ul style="list-style-type: none"> • Low access to public growing spaces 	<ul style="list-style-type: none"> • Municipalities should ensure a certain number/measured area of growing spaces per subdivision to utilize
<ul style="list-style-type: none"> • Farmers' markets and CSAs are costly to participate in 	<ul style="list-style-type: none"> • Promote cost-offset CSAs or volunteer time in exchange for a portion of the harvest
<ul style="list-style-type: none"> • Farmers' markets are only open for small windows of time 	<ul style="list-style-type: none"> • Better operating hours- not just weekends, after work hours during the weekdays would make farmers' markets more accessible
<ul style="list-style-type: none"> • Many cities lack sufficient policies that address UA 	<ul style="list-style-type: none"> • State or federal law could enact laws that require municipalities to have adequate policy in regards to UA

<ul style="list-style-type: none"> • UA can contribute to gentrification 	<ul style="list-style-type: none"> • Integrate UA projects into low-income housing developments
<ul style="list-style-type: none"> • Overall lack accessibility to UA, especially in marginalized communities 	<ul style="list-style-type: none"> • Municipalities should promote UA projects, especially in historically underserved communities
	<p>Table 3: The Solutions to the Challenges of UA</p>

Conclusion

UA should be utilized in every area where it is possible. There are many benefits associated with UA that outweigh any potential shortcomings. UA will not be the fix-all solution that completely alleviates food insecurity and stops the systemic inequities that keep people from participating in UA. UA can be a tool for those who decide to utilize it. If we look at the cities that reap the most benefits from UA and apply that to the cities lacking in UA infrastructure, it can help them find a way to obtain those same benefits.

The government should have the responsibility of making UA as accessible as possible. Without the government's role, the burden of low food access is placed onto the people. Telling people who face low food access and food insecurity to just "grow your own food" enforces a self-help attitude that can push people away from wanting to participate in UA projects. Every human being should have access to safe, healthy, and affordable food. The government is responsible for ensuring that its constituents have their basic needs met. UA can be a part of the vast array of different solutions that are used to address food insecurity. Different stakeholders can address the shortcomings of UA by working together to find the best way to use UA to address food insecurity, including governmental and non-governmental entities.

The results of this paper show how crucial it is to have quantitative data on UA's effect on food access; without statistical significance, it is harder to understand UA's role.

With more information available, UA would increase the positive effects it has on the environment. Better data on UA would have a more significant influence on policymakers' decisions. Though UA may not solve the issue of world hunger on its own, it is an invaluable tool that we can use to fight for increased food security, food access, and food justice.

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Appendix A. Literature Search Procedure

To assess UA's impacts on food access, I conducted this literature review through extensive research of peer-reviewed journal articles and government documents. I accessed the peer-reviewed journal articles through the California State University, Sacramento (CSUS) Library. This paper utilized many databases offered by the CSUS library; the top databases consisted of EBSCO, Science Direct, JAFSCD, and SAGE. Critical phrases used in the search included urban agriculture, food deserts, equitable food access, social justice, urban policy, local food system, global food system, and food justice.

Appendix B. Landscaped Page

Item	N (Store Pairs)	Average Price at Small Food Store	Lowest, Highest Small Food Store Price	Average Price at Nearest Supermarket	Lowest, Highest Supermarket Price	Price Differential Relative to Supermarket Price (%)	P-Value
<i>Produce</i>							
Apples (lbs)	56	\$1.94	\$1.09, 4.20	\$1.76	\$0.89, 2.99	10%	<0.001
Bananas (lbs)	64	\$1.18	\$0.49, 1.93	\$0.77	\$0.29, 1.39	53%	<0.001
Oranges (lbs)	42	\$2.03	\$0.79, 3.55	\$1.75	\$0.50, 2.99	16%	<0.001
<i>Milk</i>							
Skim (gallon)	77	\$4.05	\$3.49, 5.79	\$3.54	\$2.42, 4.99	14%	<0.001
1% (gallon)	76	\$4.09	\$2.19, 3.39	\$3.60	\$1.72, 2.99	14%	<0.001
2% (gallon)	93	\$4.18	\$2.19, 3.99	\$3.70	\$1.79, 3.39	13%	<0.001
Whole (gallon)	90	\$4.28	\$2.19, 3.99	\$3.86	\$1.79, 2.99	11%	<0.001
<i>Protein staples</i>							
Peanut butter (17 oz)	112	\$3.89	\$1.00, 5.99	\$3.00	\$1.21, 5.33	30%	<0.001
Eggs (dozen)	87	\$2.43	\$1.00, 4.29	\$2.27	\$1.39, 3.49	7%	<0.001
Tuna (5 oz)	105	\$1.68	\$0.80, 2.49	\$1.58	\$0.65, 3.99	6%	<0.001
Dry beans (16 oz)	57	\$1.86	\$0.99, 2.99	\$1.64	\$0.60, 2.59	13%	<0.001
<i>Grain staples</i>							
Chickens TM (18 oz)	70	\$7.41	\$2.16, 11.10	\$4.82	\$3.54, 7.94	54%	<0.001
Rice Krispies TM (18 oz)	51	\$7.53	\$3.00, 11.38	\$5.14	\$3.29, 8.54	46%	<0.001
White rice (16 oz)	75	\$2.02	\$0.50, 3.99	\$1.35	\$0.50, 2.99	50%	<0.001
White bread (20 oz)	82	\$2.20	\$0.99, 5.00	\$2.74	\$0.85, 4.99	-20%	<0.001

Prices were standardized to the size indicated if only another unit or package size was available.

Table B1: Availability of Items at Supermarkets, Small Food/Corner Stores, Gas-Marts, Dollar Stores, and Pharmacies, Minneapolis and St. Paul, MN, 2014.

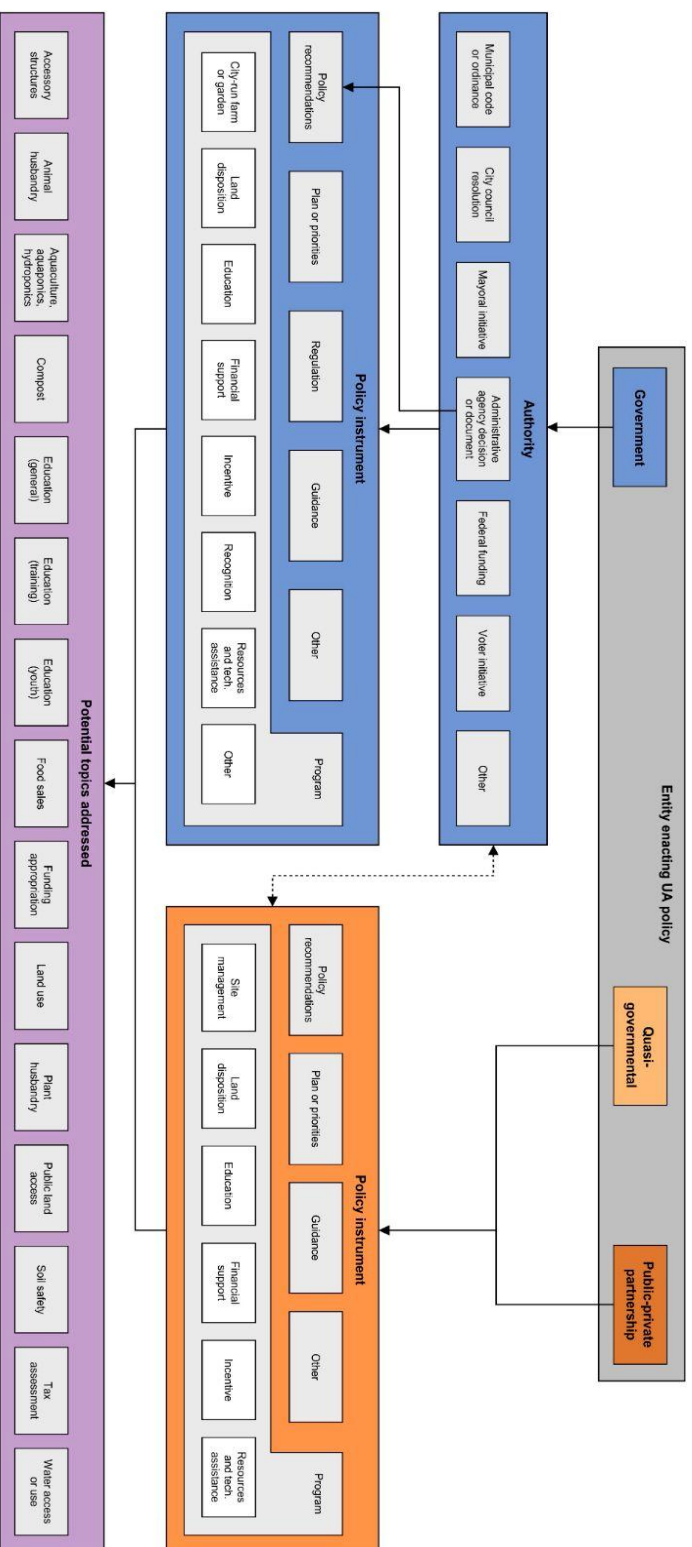


Figure B1: Framework of means by which municipal governments enact UA policies on various topics, through different entities, authorities, and policy instruments (Halvey et al., 2021).

