How Local Cultural Factors Impact Urban Garden Sustainment and Food Insecurity: An Anthropological Case Study of Los Angeles County

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The global population is expected to increase significantly over the next few decades, especially in urban areas. A challenge faced by many urban communities is a lack of availability and access to healthy and nutritious food, a challenge commonly called food insecurity. Establishing urban gardens with the influence of local communities and cultures is a potential solution to address food insecurity in low-income areas. This study investigates the connection between cultural factors and urban garden creation for food security and sustainability in Los Angeles, California's low and middle-income communities. A survey was conducted with ten urban gardens to reveal how culture and social factors might influence cultivation choices, community involvement, and the challenges these initiatives face. The study's results reveal that cultural factors shape food choices in urban gardens, reflecting cultural preferences through the crops grown and highlighting the diverse ethnicities and cultural identities these gardens serve. This research also identifies a high presence of middle-income families consisting of single and multi-family households and individuals utilizing urban gardens. Furthermore, the study investigates solutions currently being used by Los Angeles urban gardens to solve challenges commonly shared across organizations. The study will provide insights to researchers and urban garden leadership on how culture shapes urban gardens and improves community well-being, with opportunities for future research. As food insecurity increases with population growth, climate change impacts, and a reduction in arable land access, localized food systems will become critical for physical and economic access to fresh and healthy food, especially in urban centers.

Keywords: Urban Gardens, Community Gardens, Anthropology, Food Culture, Cultural Fit

Introduction

By 2050, the global population is projected to increase to 9.7 billion, with much of the population expected to reside in urban centers [1,2]. However, studies have shown that urbanization correlates with food insecurity and malnutrition [1,3,4], with marginalized communities and low-income neighborhoods experiencing the most impact due to historical and present drivers such as systemic racism and supermarket redlining [5–7]. Areas with limited access to affordable and healthy food are commonly called food deserts, while areas with easier access to less nutritious food are referred to as food swamps [8–11]. Food activists and justice leaders such as Karen Washington point out that the terms food deserts and swamps do not acknowledge the root causes that have led to food insecurity and injustices for Black, Indigenous, and people of color. Washington further states that the word "desert" does not recognize that these communities are vibrant and innovative with life and potential. Washington is credited with coining the term "food apartheid" to underscore the decades of systemic injustice based on class, geography, and race that have led to a segregated system of nutritious and healthy food access [12–14]. With the rise in population over the next few decades, it is critical to address the food insecurity challenges created by systems such as food apartheid, as it is expected that marginalized communities and low- and middle-income areas will experience the increased pressure put on urban resources [15]. For example, a 2023 study conducted by the USC Institute for Food System Equity found that food insecurity in Los Angeles County has steadily increased from 17% or approximately 553,000 households reported being food insecure in December 2021 to 30% or approximately 1 million households as of July 2023 - the highest rate of food insecurity since 2010. [16,17]. Notably, rates of food insecurity are more than two times higher among Hispanic/Latino (38%) and Black/African Americans (38%) than Caucasian (16%) residents. Of Los Angeles County residents who experience food insecurity, 62% are Hispanic/Latino, and 77% are low-income [16].

One way marginalized communities in urban areas have been and continue to address the impacts of food apartheid is through the development of urban gardens that are influenced by the communities in which they serve [18].

A primary goal of urban agriculture is to produce and increase

access to fresh food that local communities can rapidly consume. The University of California confirmed that growing food in community gardens gives people more access to fresher and higher-nutrient vegetables and fruits[19]. With access to garden plots, community gardeners can produce food that enriches the diets of their families and other community members, leading to the distribution of cheap and affordable foods[20,21]. Access to lower-calorie and high-fiber foods is associated with a healthier diet[19]. Some urban gardens also provide informational programming to educate community members on eating healthy foods[20].

Through the production of localized food and providing access to education, urban gardens help build response capacity to pressures on urban communities and food supply[22–24]. However, there is still a gap in understanding how local cultural factors impact the creation and sustainment of urban gardens and if the consideration or lack thereof impacts food security.

A Brief Look at Urban Garden History

Urban gardens can take different forms such as raised beds, rooftop farms, small production greenhouses, or vertical gardening. Many of these designs have their foundation in preindustrial agriculture. Anthropologists have studied historical sites with diverse gardening practices, such as Constantinople, Petra, and Mayan cities to understand how resilient agricultural urbanism contributed to the food support systems prevalent in today's societies[25–27]. The technology that is utilized today, such as indoor growing space or controlled environment agriculture, also has its source knowledge from historical garden development, such as the development of controlled environment agriculture in the Joseon era greenhouses of Korea[28], the Han Dynasty greenhouses of China[29], and later, the greenhouses of Rome[30]. Today, urban gardens have shifted away from extensive, labor-intensive practices by using fewer synthetic fertilizers and pesticides and innovating how and where plants are grown with little to no arable land.

With the diversity of people in the United States, much of the gardening practices present today have been influenced by the traditional ecological knowledge of indigenous communities and knowledge brought to the Americas through immigration and forced enslavement[1,31,32]. Urban and community gardens are commonly found as a central part of many communities, especially ethnic enclaves, in which people of the same or similar ethnicities live in proximity within a neighborhood or geographic location (i.e., Chinatown, Little Italy). When living in a new place, gardens can create a "home-like" environment that allows people to recreate aspects of their cultures and places of origin or connect with their family history[33–35]. Thus, urban gardens provide food production and establish community gathering places to socialize, find safety, and share knowledge, traditions, and cultures. Gardens are commonly seen as sites of social-ecological memory preservation[18,22,23] and have been used to improve community resilience, and in recent history, have been at the center of food justice and equity activism[36–39].

The Importance of Food Culture and Cultural Fit in Establishing Urban Gardens

The Food and Agriculture Organization of the United Nations (2022)[40] defines food security as "a situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life." Food security is divided into four dimensions: food availability, access, utilization, and stability, with sustainability and agency proposed as two new dimensions[40]. If a dimension of food security is not met, the individual or community is defined as food insecure. Since 2007, food insecurity has risen in the United States[41,42], with 92% of hunger-related deaths in low-income areas associated with chronic or recurring health issues and malnutrition[43,44]. If food security cannot be maintained, the food system is not sustainable. According to the Sustainable Agriculture Research and Education Organization (SARE), to achieve sustainable agriculture, social sustainability must be met – in which quality of life, justice, relationships, and equity are achieved in the food system[45]. Food culture, cultural fit, food values, and the presence or absence of autonomy to make food choices have been used to describe important elements of social sustainability in food systems[33,36,46–48]. However, there remain open questions and a need for understanding how culture impacts and drives food security[49].

Food culture is "the manner in which humans use food, including everything from how it is chosen, acquired, and distributed to who prepares, serves, and eats it"[50]. The concept can expand further to include the values communities place on food and how it is grown, such as trust, control, freshness, organic production, and agency in food choice[47]. Cultural fit also considers if the methods, materials, values, and outcomes of, i.e., a project or government response are appropriate and effective within the culture in which the project is taking place. For urban gardens, considering cultural fit would influence what is planted or what materials are used to build and manage the site and where they are sourced. If local cultural and social factors are not considered and people of that culture are not part of the project design, more harm than good may be caused[48]. Miller (2011)[51] explores an example of a project where powdered milk was introduced to a community in the South Pacific Islands to improve their nutrition and health. The historical absence of milk products in the food culture was not considered, and many local people were found to be lactose intolerant. The project was ultimately not sustainable[51]. Effective action to maintain social sustainability and food security in a community requires community involvement. Individuals, organizations, and com-

munity leaders wanting to implement or improve urban gardens must understand their communities' priorities, challenges, and cultural and social factors to produce food for diverse people and circumstances. By working to solve community challenges and develop community partnerships, urban gardens might also find solutions to their own challenges.

Challenges Urban Gardens Face and How They Combat Them

Kwartnik-Pruc and Droj (2023)[21] found that one of the challenges many urban gardens face in urban planning is land scarcity. Due to commercializing urban lands as well as the lack of multifunctionality permitted in urban green spaces (i.e., allocating land for a park but not allowing community gardening), many gardens are being displaced, leading to even scarcer land availability[52]. The decline in these urban gardens is also attributed to rising land prices and limited funding from local authorities[21]. In a case study from Greece, Anthopoulou et al. (2017)[53] found that even as urban gardens helped food insecurity challenges and grew in use during economic crisis, local authorities still considered such spaces short-term solutions and not part of long-term sustainability and social policy. Additionally, green gentrification has become an increasing issue in neighborhoods in which the development of green infrastructure such as gardens and parks leads to increasing housing prices and drives out locals who can no longer afford land prices[54,55].

To combat such challenges, urban gardens have been innovative in diversifying funding sources and partnerships. Garden support programs and organizations that can provide volunteers in exchange for volunteer hours, free produce, education, and recreational opportunities for both physical and mental health are becoming a key resource to urban gardens. Detroit, Michigan's garden support program, Keep Growing Detroit, is one example of an organization created to provide material, education, and technical support to local garden organizations and individuals[56]. Master Gardener programs have also been found to provide support with equipment loaning and expertise[57]. Partnering with local schools, colleges, and afterschool programs also provide opportunities to have young people volunteer at the garden, provide educational programming, supplement school dining programs, provide opportunities for recreation and a connection to nature to improve physical and mental health, as well as close environmental equity gaps[58–60]. Gardens have also been placed on hospital grounds which provides land, water, and potential funding for the garden and encourages dieticians, nutritionists, and others in the hospital to support community health and nutrition[61]. If land is scarce, gardens have also been established as rooftop farms/gardens, which also has the added benefit of cooling the urban environment[18]. Furthermore, to increase the amount of community members involved with urban garden organizations, urban farms have supported the local economy by being vendors at farmers markets. Interacting with the community through farmers markets as well as outreach initiatives can also lead to increased knowledge and potential membership or volunteer engagement at the urban gardens. Samus et al. (2023)[62] found that more discussion between community members can lead to more biodiversity-friendly gardening and an increase in garden engagement. It is important to address the challenges faced by urban gardens to ensure not only the sustainability and success of urban gardens in combating food insecurity, but also to recognize when and where innovate partnerships and opportunities can be created.

In this study, an ethnographic survey was sent to urban garden organizations in Los Angeles County to investigate how cultural and social factors and challenges influence garden organization and to understand how urban gardens are and could be contributing to local food security and sustainability. The impacts of culture and social factors on gardens can be found in the literature; however, there are few case studies in which garden leadership are asked about their personal and organizational experiences. This study looks to highlight how Los Angeles County urban gardens are interacting with their communities and what is impacting organizational sustainability and community food security as well as highlight innovative ways for garden leadership to implement strategies to increase sustainability and community impact.

Methodology

Study Site

Urban gardens for the study were only considered in Los Angeles County, California, United States (34.3872° N, 118.1123° W). The survey occurred from October 12 to October 27, 2023. As of July 1, 2022, an estimated 9,721,138 people live in Los Angeles County according to the United States Census Bureau (2022)[63]. According to the Pew Research Center income calculator, in 2021, 33% of households were lower economic class, 49% were middle class, and 17% were upper-class households in Los Angeles County and Orange County[64,65].

Ethnographic Survey

The ethnographic survey was approved by an Institutional Review Board following the guidelines provided by Regeneron STS before starting the study. Fifty urban gardens were contacted directly through email. The fifty urban gardens were found through the Los Angeles Community Garden Council website. They were selected based on the criteria that the gardens grew crops and had a publicly available email address. The survey was provided as a Google Form within the email. The email asked that the respondents of the survey be urban garden leadership members to ensure the answers provided were

representative of and provided insight into garden management, activities, and community impact. To further ensure the respondent gardens were representative of the socioeconomic distribution of Los Angeles County, the median household income for the cities or town in which the 50 gardens were located were compared to the locational median income of the gardens who responded to the survey. The median household income brackets were based on the Los Angeles Almanac's projection for 2024 within households of three people, determined through the Pew Research Center's results and adjusted for the inflation between 2018 and April 2024[65]. The median household income for each city and town in Los Angeles County was then pulled from the County of Los Angeles Open Data Median Income and AMI (census tract) government website (2023)[66].

The survey consists of five sections for a total of twenty-nine questions: Section 1: Survey Recipient Information (eight questions), Section 2: Organization Information (eight questions), Section 3: Community Food Access (five questions), Section 4: Community Members/People who participate and use the organization's services (five questions), and Section 5: *Community Food Culture & Community Involvement* (three questions). In Section 1, Survey Recipient Information, the survey includes demographic questions of the urban garden leader and details about their job responsibilities to better understand the perspective and roles of the individuals surveyed. In Section 2, Organization Information, information about the organization is requested to gain insights into the location of the urban garden, the goals of the garden, as well as how the organization interacts with the community and receives funding. T*he Community Food Access* section (Section 3) seeks information on what sources of food are available to community members by the garden and outside of the garden and the potential, local cultural and social factors influencing food security. To understand how the urban garden fits into the landscape of community food security, food access outside of the urban garden is critical to survey. *The Community Member* section (Section 4) seeks information on the households and community members using the garden services. Questions are asked about economic circumstances, community demographics, and multilingual services to gain insight into who is utilizing the garden as well as if the garden leadership takes community member demographics and potential barriers to entry (i.e., language barrier) into account when making organizational decisions. Such information can reveal challenges and/or opportunities for gardens to increase access, inclusion, and funding. *The Community Food Culture & Community Involvement* section (Section 5) seeks information on how the urban gardens might be considering local food cultures, how community members are involved in garden creation and operation, and how the organization involves the community in different ways. These questions help determine how involved the community is in garden decision making and its potential impact on food security.

Analysis

As the survey is non-numerical, each survey was qualitatively analyzed for trends in topics, commonalities in challenges and situational variables, and differences in how the organizations handle challenges or run the gardens to shed light on the various ways social and cultural factors influence and shape the creation and sustainment of urban gardens in Los Angeles County.

Results

Background Information of the Recipients

Of the fifty urban gardens contacted, representatives from ten separate organizations completed the survey. The respondents consisted of five men and five women. Three of the respondents identified as Hispanic or Mexican, one as Asian, and six as White/Caucasian. The respondents had the job titles of garden coordinator, manager, owner, or vice president. The responsibilities of the respondents included taking care of the gardens, overseeing garden policies, managing outreach and education, and collaborating with organization members in charge of caring for different aspects of the gardens. 80% of the respondents had five or more years of experience working with local community gardens, with one respondent stating 30 years of involvement.

Organization Information

The ten urban gardens span a wide range of Los Angeles, comprising of Woodland Hills, North Hollywood, Altadena, Hermosa Beach, Panorama City, Watts, Santa Monica, and the heart of Los Angeles. The median household income of the cities in which the urban gardens are located were determined for the ten respondents as well as the 50 gardens originally emailed to compare income bracket distribution (Figure 1). Figure 1 shows that the ten urban gardens have a similar income bracket trend to the 50 gardens, with the majority of the gardens located in middle-income brackets and no gardens located within upper-income bracket. The percent income distribution of the gardens in Figure 1A (the 50 garden locations) are 22% lower-income bracket, 20% lower-Middle-income bracket, and 58% middle-income bracket. The percent income distribution of the gardens in Figure 1B (the ten garden respondent locations) are 10% lower-income bracket, 20% lower-middle-income bracket, and 70% middle-income bracket.

All of the respondent gardens provide land for community members to garden; however, 70% of the respondents indicated that a key driver of their organization is to provide access to land and associated resources (i.e., water) for members to grow their own food as the neighborhoods in which they are located have limited to no land access for individuals and households to garden at home. "[A goal of our organization is to have] long term leases where [community members] can operate where no

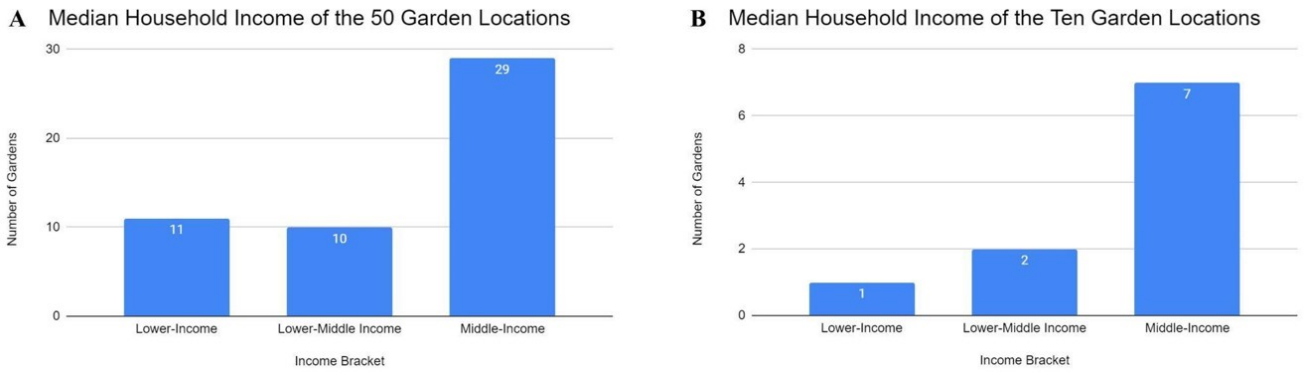

Fig. 1 Median household income for cities and towns in which the sampled urban gardens are located in Los Angeles County. (A) The median household income brackets of the cities and towns in which the initially sampled 50 urban gardens are located. (B) The median household income brackets of the cities and towns in which the 10 garden respondents are located.

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one is displaced, and no one is being priced out" (Respondent 10). However, 100% of the organizations indicated that their organizations cannot be the only source of food for households, requiring the process of external food sources such as grocery stores. Two of the respondents did indicate that they make it a priority to donate free food to families and organizations in need. 30% of respondents mentioned providing a space to promote mental health and safety as additional drivers, with one respondent detailing the presence of handicapped plots on location to increase access to community members. "The neighborhood was in need of a positive and safe environment, and this was a welcomed addition to [the neighborhood]" (Respondent 3). Education was also mentioned by 50% of the respondents as a core part of the organizations' programming, including topics such as gardening and compost education as well as on-site volunteer opportunities. In the words of a few respondents, "[We] promote sustainable growing practices, address food and gardening education, and community building" (Respondent 3). "[We seek to] honor the diversity, unique qualities, and cultural ideas of [our] gardeners and the community" (Respondent 7).

Our goal is to "promote sustainable growing practices, address food insecurity, food and gardening education, and community building" (Respondent 3).

In terms of the scale of organizational efforts, 80% of respondents indicated that they serve their local community or neighborhood, whereas one respondent indicated that their organization serves a greater area across the city, and another did not indicate their organization's scale. When asked about challenges impacting the sustainment of the organization, 30% indicated that they are not facing any challenges to sustain their organizations. 20% of the gardens noted that they may not face economic challenges but have waitlists consisting of hundreds of people awaiting garden plots and need to expand their efforts. The other 50% indicated challenges such as lack of funding (30%) and increasing costs of water (10%) and lack of volunteers (10%) (Table 1). The gardens state different responses to address the challenges. 50% of the respondents state the importance of charging a membership fee to rent a garden plot as well as seeking out partnerships with non-profit organizations. Two respondents specifically mentioned partnerships with city organizations. One respondent highlighted that they are fortunate to be located on a school's property, so they do not have to pay for their own water and worry about associated high expenses. 70% of the gardens rely on volunteer work to maintain the physical presence and well-being of the properties. There is also an understanding within the gardens that members put in the work to maintain their own garden plots.

Community Food Access

Most of the respondents stated similar levels of food access, though there is variation. Two of the ten gardens did not respond to the food access questions. Of the eight responses, 87% indicated the presence of large-scale grocery stores within their community, with one respondent indicating that community members would need car or public transportation to access the stores. When asked about the presence of bodegas or small

Challenges	Respondent #	Proposed Solutions
Lack of funding	1, 4, 7	Find grants and ways to fundraise, partner with city organizations, plot rentals
Cost of water	5	Being on a property such as a school with water provided, have partnerships with non-profits and city organizations
Lack of land to meet demand	9, 10	Rental memberships of plots
Lack of volunteers	2	Set of community chores, have every gardener be in charge of their own garden, people sign an agreement to maintain their own plot

Table 1 Challenges, Respondent # and Proposed Solutions

corner stores, three gardens did not respond, leaving seven responses. 86% of those responses indicated that bodegas or small corner stores were available and 14% indicated there were none in the community. The gardens were also asked if there were other community gardens and/or foraging opportunities outside of the services provided by their own organizations. Two gardens did not respond. Of the eight responses, 63% indicated that there were no foraging or alternative gardening opportunities available, while 37% stated that opportunities were limited. For example, respondent 9 states, "If one knows where to look, there are public fruit trees, and often private fruit trees that extend into the public right of way." Respondent 10 states that they often find themselves referring some of the families utilizing their services in their community out to other gardens if they do not offer the resources at their own facility. In terms of food availability to garden members and the broader community, one garden states that the food is solely produced by members for members. The other 90% of respondents indicated that if there is an abundance of food available, the garden encourages and even helps organize food donations or sharing into the wider community. Respondent 10 notes that many garden members participate in sharecropping to split costs and increase food access amongst themselves and their neighborhoods. Additionally, one garden works with a non-profit organization in which a percentage of the food produced by members is donated to the organization.

In terms of what cultural and social factors are influencing the sustainability of urban gardens and community food security, eight of the ten gardens provided clear responses. Respondent 1 postulates that the increase in people seeking out urban gardens in Los Angeles County is due to wanting to know where their food is coming from and how it is grown. Respondents 2, 3, 4, 5 and 9 postulate that restricted access to land, lack of growing space, and low income greatly influences the availability of food, impacting community food security. Respondent 10 states that their garden has a diversity of individuals coming from different cultures and backgrounds and that the key to their sustainability is connecting with their members and creating a safe, neutral space for people to plant what they want and work together towards common goals. Respondent 8 indicates that they do not see any social or cultural factors impacting their garden or community.

Community Members/People Who Participate and Use the Organization's Services

The types of households the urban gardens serve vary. From the ten respondents, 20% specified that they serve multi-family and single-family households, nonprofit organizations, and unhoused individuals and families. Another 20% only serve single-family households and individual members of the garden. The other 60% support all the aforementioned household types except for unhoused individuals (Figure 2).

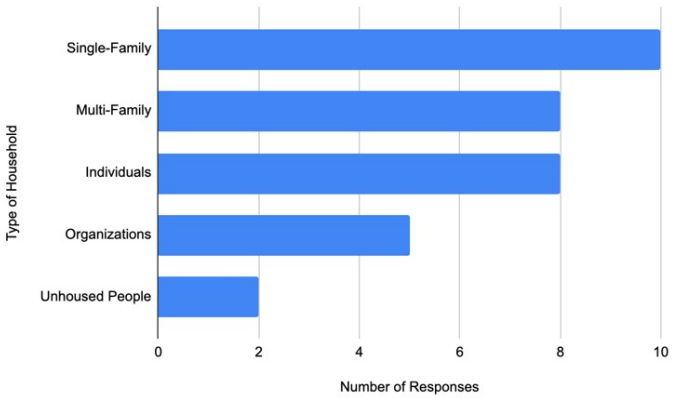

Fig. 2 Survey responses to the question, "Is your organization serving single-family households, multifamily households, nonprofit organizations, single-parent households, homeless individuals, homeless families, etc.? Please provide details if possible." Respondents could write however much they wanted.

Economic indicators were also asked. Figure 3 details how the respondents describe the economic situation of the community members using their organizations' services. 80% of the gardens indicate that their community members consist of people who are in the middle-income bracket, with low-income

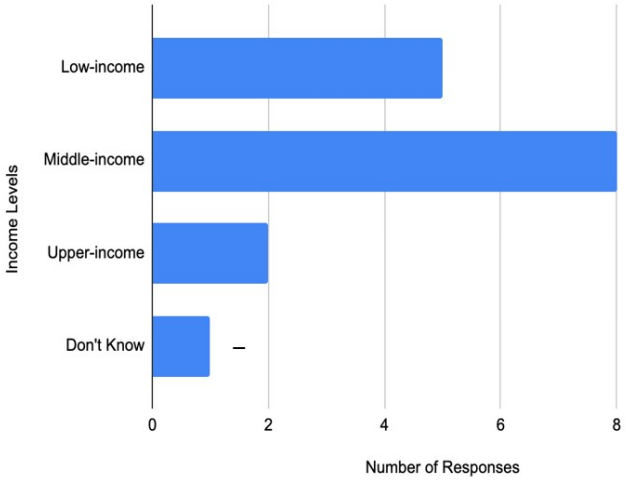

Fig. 3 Survey responses to the question, "What is the economic situation of the community members or people who use the organization's services?" Respondents could choose one or multiple responses to describe the economic situation of the community members whom the urban gardens serve.

the second most picked at 50%. It is important to note that most of the respondents who put low-income also put middle-income, indicating that the gardens serve a diversity of households that range between low- and middle-income.

In terms of racial and ethnic demographics, 100% of respondents state that they serve multiracial and ethnically diverse communities. Respondent 8 details that their community is "largely Latino, but within the garden membership, we are…diverse between Black, Asian, Caucasian, Latino, etc." When asked if any of these organizations require or need multilingual services or if the organization provides any multilingual services, one garden did not respond. Of the nine gardens, 56% of the gardens responded that they can translate from Spanish to English or vice versa but not any other language. One of these gardens also provides translation services for Korean speakers. Another garden notes that they need to provide more opportunities for non-English speakers. The last 44% do not provide any translation services.

Community Food Culture & Community Involvement

In the majority of responses for whether food culture influences garden production, the respondents indicate that the members of the gardens control much if not all of the food/crop selection as they are the ones performing the majority of the gardening; thus, the food culture is largely determined by the individual gardeners instead of the garden leadership. Respondent 1 states that "food preferences, lifestyle, and seasonal grow crops influence the decision of what to grow", while Respondent 4 whose garden services have households growing their own food, states that when individuals grow food, "in most cases, their choices reflect their ethnicity." However, four respondents indicated that their leadership does also mindfully participate and encourage in food culture presence on site. Respondent 5 shares, "We have various crops that have cultural significance for different community groups. An example is the mulberry orchard we have which is popular with our Armenian neighbors." Respondent 9 and 10 indicates that they encourage local indigenous plants as well as medicinal plants for health benefits. "[We] grow foods that are unique to cultures and rotate them when we receive new suggestions" (Respondent 10).

> "We encourage local, indigenous plants, including growing foods that are unique to cultures" (Respondent 9).

Respondent 3 states that the individual farmers can grow anything on their plots, but when they as a garden have their food drive events, the food they offer is "specific to what the local community has expressed interest in and need for." 80% of these gardens also detailed how community members were involved in the selection, care, and harvest of the food/crops made available to the community. When Respondent 10 was asked this question of whether their community members are involved in the process of crop production, their response was, "[One hundred percent], from seed to plant and the people are always directly in a decision-making process about what crops are grown." In contrast, the other 20% of responses state that the items that they grow are not reflective of the culture, and are instead, selected and grown based on season. Table 2 summarizes the social and cultural factor mentioned by the respondent gardens.

Discussion

Cultural Factors Shaping Urban Gardens

The findings of the study reveal that urban gardens in Los Angeles County are providing food access, community engagement, and educational support for multicultural communities on a localized, neighborhood-scale, with members who identify, for example, as Hispanic, Asian, African American, Caucasian, and Armenian. The study shows a key connection between how community values shape garden values. In terms of garden values, several respondents mentioned how their gardens are

Social Factors *Societal structures and interactions*	Cultural Factors *Ideology, values, customs, and traditions*
• Access to land (i.e., rental/ownership costs, lack of multifunctional green spaces) • Lack of growing space within accessible land (i.e., not enough growing space, contaminated soil) • Low income (i.e., median household income) • Costs (i.e., food, water, materials) • Funding (i.e., government funds/grants, donations) • Organizational partnerships (i.e., city, non-profits, schools) • Volunteer/work opportunities	• Acceptable space (i.e., creating a safe space for all people) • Common goals (i.e., sharecropping, sharing of knowledge) • Education (i.e., seeking knowledge of where food comes from and how it is grown, gardening techniques) • Language (i.e., translation services) • Freedom of seed and crop selection (i.e., individuals involved in decision-making processes) • Food preferences/food culture (i.e., crop selection, communication with garden leadership for collective food initiatives) • Collective food spaces (i.e., orchards) • Health (i.e., physical, nutrition, mental) • Communication (i.e., community involved in initiatives and decision-making) • Indigenous knowledge and plant varieties (i.e., education, sense of place) • Cultural Fit (i.e., garden leadership creating collective food spaces that fit the local food cultures)

Table 2. Social and cultural factors influencing urban gardens in Los Angeles County.

safe and healthy spaces for community members that might not have such spaces outside of the garden. Additionally, many of the gardens prioritize communication with their members and communities to ensure they are providing education, food items, and programming that is valued by the community. Table 2 summarizes these shared values and goals, which are reflective of the unique as well as the shared cultures of the communities in which the gardens serve. Studies have shown that businesses and organizations that find success prioritize organizational values that are reflective of social identity, the organization's fit within a space, and shared and unique culture[67–69]. As urban gardens face challenges associated with gaining members, finding volunteers, or developing effective outreach programming, they should consider the cultural factors (Table 2) that are prioritized by the community and could be integrated into the garden's organization. With increased membership and community involvement, the gardens might also find that the social factors and challenges impacting their gardens are lessened or have an easier path to being solved, revealing how social and cultural factors can impact each other.

The results of the study also show how cultural presence influences crop selection. The majority of respondents either incorporate cultural food choices into their crop rotations to reflect the cultures within the communities they serve or have community members who do so in their own individual plots at the gardens. For example, Respondent 5 states that their urban garden has a mulberry orchard that is popular with the Armenian population - an example of how a garden is considering cultural fit. This supports the claim that urban gardens are a place where people from different cultural backgrounds can show their own alternative food system vision. In a study by Santa Clara University, they found many gardeners devote portions of their gardens with cultural traditions such as producing bitter melon, bok choy, chayote, Chinese broccoli, goji berries, taro, and many other types of produce[47]. Respondents 1, 4, 5, and others emphasize the influence of cultural food preferences, lifestyle, and seasonal crops on their decision-making each growing season. Respondent 10 also points out the importance of incorporating local indigenous crops. Based on the responses, there are urban gardens present in Los Angeles County that are actively implementing programming and management as well as allowing community decision-making that is reflective of food culture and food preference among their community members. This can also be seen in a research study conducted in Lansing, Michigan. Refugee and immigrant urban garden participants from Kenya, Malawi, Burma, Bhutan, Congo, and Haiti, reported that the participants related "the importance of growing and sharing culturally relevant produce and recipes within their own cultural communities, especially foods that are expensive or hard to find in local stores and/or foods that are central to traditional ceremonies or gatherings"[35]. Thus, the community garden provides a place for immigrants and refugees to grow food that is important to them and to create social bonds. The study further found that having agency over decision making in the garden was important to participants. They appreciated the ability to choose what to grow, share their needs for items such as particular kinds of seeds or tools, and the opportunity to do what they want with their harvest[35].

Some other cultural practices or beliefs that can influence garden sustainment are culture-specific classifications of what crops are grown for human nutrition versus what are grown as non-food items. For example, a study in Micronesia found that when a government program tried to reduce Vitamin A shortages by promoting the consumption of green leafy vegetables, the project ultimately failed. In this community, the leafy vegetables were seen as animal fodder rather than food for humans. Respondent 3 reflects the importance of community input with their food drives in which community members decide the food stuff they want and need from the urban garden. Communication between garden leadership and their local community is key to making decisions on community initiatives as well as creating a safe space for people from a diversity of cultures and backgrounds. As stated in the introduction, communication and involvement of local community members can ensure initiatives fit the culture in which they occur. Additional cultural factors that might influence urban gardens that have not been considered in this study include decisions about food waste, religious

beliefs, food distribution practices such as who in a cultural household is served food, food taboos regarding what should or should not be eaten, and dietary knowledge[49]. More studies on how cultural factors influence crop selection as well as urban garden programming need to be performed as this study has shown that cultural factors are influencing urban garden membership, crop selection, and how and what initiatives urban gardens implement.

It is important to note that two respondents, in contrast, indicate that crops were chosen based on seasonal requirements rather than cultural preferences, with one of the respondents further stating that social and cultural factors do not impact the sustainment of their urban garden or community food security. It is unclear from the survey results if the absence of cultural considerations for crop selection and planting impacts the sustainment of the urban garden or the food security of the community. Further research comparing gardens that incorporate cultural foods and practices and those that do not would provide additional insight into how cultural fit and food culture impact community members' willingness to participate in an urban garden and thus a garden's overall impact on food security. A study performed by Schrup (2019)[54] found that consideration of social and cultural factors would ultimately benefit urban gardens as such factors are not only important to create an inclusive, accessible environment, but can also make structural, social, and cultural barriers to certain groups of people much more apparent.

Contribution to Food Sustainability and Security

Most of the urban gardens confirmed that their main goals are to provide space for their respective communities to grow their own food, to promote and teach community members about sustainable growing practices in a safe space, and simultaneously do what they can to decrease the impacts of food insecurity. The majority of the urban gardens are found in communities in which local foraging and alternative gardening options are not available, limiting their options to potentially inaccessible - physically or financially - grocery stores or the limited selection of produce at bodegas. Diekmann et al. (2020)[47] found that many urban gardens yield more crops and vegetables per unit area than commercial or biointensive agriculture, showing that urban gardens have the potential to be impactful in communities. However, challenges and resource limitations can influence these yields. As noted by the garden respondents, all of their community members currently have to supplement their urban garden produce with food from grocery stores. Even so, some of the gardens do work with local organizations to ensure additional services are present in the community, such as non-profit organizations, as well as implementing community initiatives through member donations and food drives.

The households that the gardens work with vary in size and type, such as single-family to multi-family households. However, some groups are still underserved across the communities, such as unhoused individuals (Figure 2) - who are the most food insecure[70–72]. Echo Park Rise Up in Los Angeles County fought against the stigmas of unhoused individuals not being welcome in parks and gardens by creating their own encampment with a community garden open to unhoused and housed individuals[73]. The economic situation of community members also ranges between low-income and middle-income, with middle-income indicated by the gardens as the majority of community member users. This is reflective of the median household income distribution in Figure 1, in which the majority of sampled urban gardens are found in cities where the majority of households are within the middle-income bracket; followed by the lower-middle to lower-income brackets. The large presence of middle-income households could also indicate shifting values to buy locally and get involved in local food production but might also be reflective of shifts or disparities elsewhere in the community, such as increased costs of living in Los Angeles County. Most respondents indicated that large-scale grocery stores are available within their communities, but it is unclear how physically and economically accessible those food sources are for different community members. Transportation, travel duration, and access to safe sidewalks to walk are potential limitations for easy access, especially for low-income households and unhoused households[74]. More research must be done to better assess why community members from different economic situations seek out urban gardens to create more comprehensive food access solutions. Additionally, the majority of respondents confirmed that if their gardens produce more food than is needed by their members, the surplus is given to other members of the community who do not actively participate in the garden.

Challenges Faced by Urban Gardens

The respondents indicated several challenges faced by urban gardens, including a lack of funding, water costs, obtaining and keeping long-term leases, and an insufficient amount of garden plots and land (see Tables 1 and 2). Financial constraints tend to be one of the most impactful challenges as they can lead to several of the other challenges listed: impeding the expansion of the garden, preventing access to water, being outpriced on rental costs, and making it difficult to pay people for services outside of volunteering. Many urban gardens rely on recruiting, training, and retaining volunteers to reduce labor costs, but face the challenge of recruiting enough volunteers or retaining them for multiple planting seasons. Gardens could also reduce costs by finding alternative, low-cost materials, and crop management methods, such as drip irrigation as a water conservation method. However, such strategies might pose challenges due to upfront material costs and labor.

Economic burden impacts the overall sustainability of urban

gardens and thus the presence of gardens in communities that they would benefit. Funding is a global challenge and an open question for such initiatives[75–77]. The majority of the urban garden respondents detail how they rely on plot rental fees and partnerships to receive funding. Nettle (2014) observes that gardens can take a top-down or a bottom-up approach to funding at different stages of development. Top-down funding occurs when land and/or funding is sourced from a government, and bottom-up funding comes from non-governmental groups such as charities and private sector organizations[78]. Respondent 4's organization uses what could be labeled a bottom-up funding source as their partnership and location on a school property make it so they do not have to pay the school to utilize the water source. Such partnerships with educational institutes and other local organizations could offer potential cost-reduction opportunities that are more accessible than other funding sources. Advocating for increased multifunctional green spaces in urban planning and collaborations with local authorities could also create unique opportunities and affect policy[21].

Additionally, several respondents brought up the unique challenge of providing multilingual services to reach more community members. Urban communities are often culturally diverse, with some community members speaking little to none of the national or majority language within the state or country in which they reside. Addressing language barriers and providing information in languages beyond English is crucial for inclusivity and effective community engagement[54]. As previously noted, social factors and challenges as well as cultural factors can influence each other. It is key for garden leadership to understand how prioritizing cultural factors could influence and impact the social challenges they are facing.

Limitations

The ethnographic survey was sent to fifty urban gardens in Los Angeles County with responses from ten, making it difficult to determine if the answers provided are representative of the urban gardens throughout Los Angeles County. However, the study did find that the ten urban gardens were reflective of the median household income distribution of the original 50 gardens selected, with the urban gardens found mainly in middle-household-income cities followed by lower-household-income cities. The median household income distribution helps provide context to how social factors might be impacting the urban gardens as well as the potential challenges being faced. Additional studies should be done to include more urban gardens across Los Angeles County to provide further insight into urban garden impacts and influences.

Conclusion

Urban gardens have been and continue to be an important source of local food and community engagement for cities in the United States and worldwide. With the increased pressures being put on local and global food systems due to population growth, climate change, and loss of arable land, urban gardens have emerged as a useful tool in the fight against food insecurity. The results of this study draw attention to the impact of social challenges and cultural diversity on the types of foods produced in urban gardens as well as what services and values are prioritized by the organization, providing evidence supporting the hypothesis that cultural and social factors influence the decision-making process in these spaces. Focusing specifically on Los Angeles County, this study provides a further understanding of urban gardening in a region known for its cultural diversity and unique challenges. Individuals and organizations seeking to engage in urban garden initiatives must consider and prioritize community preferences in cultivation choices to guide more participatory and community-driven approaches. Additionally, the challenges of funding constraints and water accessibility for urban gardens must be addressed as the respondents made it clear that such challenges are key drivers for long-term food sustainability in communities. Urban gardens and communities must advocate local governments to ensure continued or better access to funding resources and physical resources, such as land and water. Such measures can be placed on ballots for the community to vote on.

Based on this study's findings, there are several recommendations that urban gardens can consider to combat challenges and improve their gardens overall. Urban garden leadership can encourage high school and college students looking for volunteer opportunities to volunteer at urban gardens and can be targeted to the students majoring in related areas of study such as environmental science, community development, food science, or even ethnic studies surrounding food culture. Gardens can also offer students who have a language major the opportunity to volunteer in translation services. Community engagement can also go beyond volunteer opportunities. Urban gardens can host educational events at schools, colleges, churches and other religious institutions, and community centers to make the community aware of the garden and encourage members of the community to participate to combat food insecurity and get involved in grassroot efforts. Increased communication between urban garden leadership and the community can lead to leadership learning what crops and food the people in the community would like to be grown. Furthermore, to embrace the cultures of the community surrounding the garden, the gardens can partner with local leadership outside of the gardens to host events that are inclusive and celebrate the cultures and people of the community. For example, in a largely Hispanic community, the garden leadership could partner with local organizations to host

a Cinco-de-Mayo celebration; or for the community garden that has a large Armenian community, host an event for Armenian Remembrance Day, which honors the victims of the Armenian genocide. Such events, when in direct partnership with the community, can bring the communities they serve closer and show that the urban garden is a safe space where all are welcome to participate.

Overall, this study seeks to set the groundwork for future research investigating how engagement between community members and urban gardens, such as having conversations about and implementing culturally relevant crop selection, fosters and leads to food security and other social services (i.e., mental health, stress reduction, fostering community connections). Further research also needs to be done globally to understand how urban gardens around the world are being implemented and whether or not they are achieving food security and sustainability. Through this knowledge, individuals and organizations will be able to design urban gardens that are inclusive, accessible, and will help impoverished or struggling communities achieve food security.

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