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Sustainable Gardening for Economic Inclusion, Poverty Reduction, and Culture Preservation

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Abstract: Sustainable gardening activities can be the basis to reduce poverty while preserving culture. By generating economic inclusion, gardening can provide the entry point into society for vulnerable communities. Community stakeholders in Mexico City and Northeast Ohio were studied to analyze whether sustainable gardening can generate economic inclusion while preserving culture. Through in-depth interviews, the relationship between these three components is analyzed. In particular, topics such as gardening experience, family traditions, institutional support, economic barriers, use of technology, cropping methods, and social integration were explored. From conception to implementation and analysis, the goal of agency building reinforced social sustainability. In addition to interpretive qualitative interviews, experiential research was conducted through a “working-with” model where the communities in reference contributed intellectual resources to the project-based research design. Primary results fall into three primary categories including gardening methods, cultural preservation, and economic factors. In each analyzed case, implications of cultural preservation emerge as a foundational motivation to maintain the particular agricultural practice. Despite significant economic barriers, including high poverty rates, the cases in reference nonetheless maintain traditions, thus highlighting the importance of culture. Negative economic implications suggest an absence of institutional support, which contribute to issues of poverty and low quality of life. Social implications indicate a level of marginalization that contributes to the aforementioned economic and institutional barriers.

Keywords: economic inclusion; poverty; agricultural practices; food productivity; food market; regional; urban; rural analyses; sustainability



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1. Introduction

Consistent with trends of urban development, the corporatization of food production has impacted agricultural activities globally. In industrialized countries, the dominant source of food distribution operates within the framework of massified production. A company moves from mass to corporate production when it maximizes benefits and takes advantage of scale returns. In late-stage corporatization, a resurgence of small-scale agricultural activities emerges in response to massification. This phenomenon responds to multiple factors, including cultural relevance, food insecurity, and socioeconomic exclusion. An example of small-scale agricultural activity is urban gardens.

Various understandings of urban gardens are present in the literature. For instance, one description asserts that urban agriculture embraces crop activities in verges and other public spaces [1], schools and private enterprises, rooftops, community gardens, and commercial farms and, of course, gardening on personal properties [2,3]. Likewise, gardening can cover food grown in backyards [4], front yards, on balconies, rooftops, and even indoors [5]. Further, urban agriculture is an industry located within, or on the fringe of, a town, city, or metropolis, which cultivates and distributes a diversity of food products, using largely human and material resources, products, and services found within that urban area and,

in turn, supplying food resources to that urban area [6]. Another understanding of urban gardening includes the use of a smaller parcel of land, with a broader diversity of crops being planted, and what is produced in the garden is consumed by the same place. Other characteristics of urban gardening include land ownership and tenure, the involvement of local planning authorities, organization, social interaction and cultural origins [5,7,8].

Within the context of food corporatization, the purpose of urban gardens thus serves as a response to the issues that emerge from massified food production. Urban gardens can enhance society by facilitating social connections, health, and food supply. Highlighting the importance of social connections, the success of urban gardening often relies on the gardener support organizations, which offer resources and provide free or low-cost materials as well as gardening education and technical support [9]. Gardener support programs have proven to be essential for the success of urban gardening, despite the type, size, and emphasis of the activities because they provide more affordable and accessible resources, knowledge, and training [10,11]. A well-organized network of gardeners that share gardening support, experiences, and knowledge is a key factor to improve food production [9]. If the organization is developed into a gardener support program, it will create local, place-based networks of gardens and/or gardeners. Likewise, it will allow members to expand the resources and technical support needed to reduce barriers to gardening. Through the networks created, an increasing number of gardens can interact, therefore allowing knowledge, social interaction, and technology features to be shared, enhancing gardening impacts [10–12].

The literature emphasizes six principle objectives in establishing an urban garden: savings and productivity; environmental restoration; environmental education; sociability; cultural values; and food security [13]. Typically, food production at a small-scale is for self-consumption and once basic needs are satisfied, any inputs can be saved for the next period to be used in production, or to support vulnerable segments of the population; thus leading to an increase in productivity [14,15]. Urban gardening also mitigates climatic conditions and pollution, generates greater biodiversity [16], and can promote environmental values [17]. The latter may lead to environmental education within society “especially by involving the young and allowing them to develop a direct relationship with nature” [18]. Gardens can complement the satisfaction of the growing food demand in particular when pesticide-free or natural products are needed, increasing quality and providing food security to communities [19]. When all of these objectives are achieved, including cultural values, gardens create social inclusion, also known as sociability [20].

In developing countries where the process of corporatization is ongoing, the purpose of urban gardens shifts from a response mechanism to a necessity of food access, emphasizing the final objective of food security. Secondary to food access is the sense of tradition present in agricultural societies that are in the process of industrializing. Related to the agricultural traditions are cultural elements, including food products that hold cultural significance, indigenous practices of food production, and social aspects of the food cultivation, distribution, and consumption process that are rooted in cultural value. While massified food production may provide relief for food insecurities in the short term, the secondary objectives of small-scale agricultural activities suffer great losses in the long term.

Challenges impacting urban gardens are widely accepted. Nine distinct challenges are identified: financial, organizational structure, water, external damage, soil, communication, interpersonal issues, participation issues, and spatial [21]. The spatial challenges are often driven by urban growth. This impact is highlighted as urbanization takes place and land use transitions from arable spaces to residential and industrial uses to accommodate urban growth. Urban centers are impacted at local levels by international issues such as climate change and push and pull factors of human migration; locally, the process and growth of urbanization alter the environmental, social, and cultural wellbeing of small-scale urban food production [22].

When considering the demographic makeup of cityscapes, implications of negative consequences of urbanization emerge as communities that experience social marginaliza-

tion are faced with geographic displacement. This is oftentimes in the context of a history of human movement and disenfranchisement that place the physical spaces of racial/ethnic minorities and indigenous communities, among others, on the fringes of urban centers. In terms of land loss, it is estimated that 1.8–2.4% of arable land will be lost globally as a consequence of urbanization in the following decade [22]. Compounded by issues of social and economic integration and lack of institutional support, the aforementioned communities will bear much of the negative outcomes due to land loss, among other factors. This study explores these challenges, among others, as well as benefits of urban gardens in two case studies.

The case of urban gardens in immigrant communities of Ohio, USA, and the case of indigenous urban gardens of Mexico City, Mexico, help in deepening the understanding of benefits and challenges of urban gardening in both industrialized and developing regions. This dual case study contextualizes local examples within the broader scope of food production versus small-scale agriculture and exposes differences in purpose but similarities in challenges faced. In the case of Mexico City, the chinampa system is claimed to be one of the most productive agricultural techniques ever developed [23]. While the historical purpose of chinampas served as the primary food production mechanism feeding the pre-Hispanic Xochimilco region, despite significant land loss, certain characteristics of the chinampa system have been sustained. High levels of biodiversity, renewable soils, natural protection from pesticides, and local production are some of the features of chinampas [24]. Due to the biodiversity present in the chinampa system, they can be continuously cultivated throughout the year. In addition to biodiversity, renewable soils and a microenvironment that protects crops from frost are characteristics of historical chinampas that have been maintained. It is noteworthy that chinampas are the only surviving indigenous farming mechanism in the postcolonial Americas [23]. Historical challenges that affected the chinampa system are likewise reflected in contemporary barriers. Following the destruction of the Aztec political system, control of the primary water source, Lake Xochimilco, shifted to colonial powers, and thus began the changing land use that remains a primary barrier to the sustainability of the system today [23].

The second half of the 20th century marked the beginning of mass population growth in Mexico City. The consequence of population growth, paired with urbanization more generally, is a decrease in available land and fresh water. The impact to chinampas specifically during this time was a decrease in over 60% of production [23,25]. Today, urbanization has led to the development of historical arable land; further, population growth in Mexico City has led to the destruction of available land for chinampas [23,25]. Since the late 80s, urbanization has led to a drop in land for chinampas from nearly 7.5% to 2.5%. Local governance has supported the use of greenhouses for produce production [23,25], further limiting institutional support for chinamperos and impacting the overall success of the system. Local government policy continues to negatively impact the experiences of chinamperos with regard to access to water. The growth in Mexico City over time has consequently decreased the size of Lake Xochimilco and today a fraction of the historical fresh water access exists. Further, the local government began using the fresh water supply of Xochimilco to provide potable water to Mexico City beginning in the 1950s [26]. As a result, treated sewage water was supplied to chinamperos, which ultimately harmed production due to environmental impacts from the polluted water [23].

The outlook for chinampas is bleak. Without political interventions, the land currently used for chinampas will be used for housing development [23]. Given the history of negative political impact to this community and considering nonlocal factors linked to the corporatization of food production, sustaining chinampas will largely depend on shifting priorities that value environmental sustainability concerns, the preservation of indigenous ways of knowing, and protections for historical and cultural relevance. For Mexico City, policies that seek to restore, rather than degrade, chinampas could positively affect water filtration, regulation of water levels, microclimate regulation, biodiversity, and carbon

capture [23], these implications do not consider the positive implications to cultural and economic factors.

The case of immigrant urban gardens in Northeast Ohio differs significantly to the chinampa system in reference. While a system of urban gardens and likewise a social system of gardeners is present in Ohio, cropping methods, types of crops, and access to resources all vary based on various factors of the garden and community itself. Unlike Xochimilco, the primary case of Mexico's chinampa system, where the water source and cultural context create a systematized environment with many similarities, the Ohio garden system includes an array of diverse nuances. However, immigrant urban gardens highlight similar challenges to the chinampa system, while also exposing significant differences. A lack of institutional resources and local governance support is implicated in multiple case studies. Although the chinampa system is negatively impacted by a lack of institutional protections with regard to natural resources and land allocation, a lack of regulatory support and land use shifts appear to be a major factor facing immigrant urban gardens. In Lisbon, for example, urban agricultural activities remain unregulated and thus fall outside of local governance for both support and regulation [6]. With regard to interactions between urban gardeners and local municipalities, experiences tend to be negative. In Cape Verde, non-regulations were the status quo for immigrant-run urban garden spaces until municipalities began demolishing infrastructure (fencing and other barriers) for development purposes [6].

Regulatory measures in London are in contrast with Cape Verde, presenting both challenges and opportunities for the predominantly foreign-born farmers practicing urban gardening. Due to the highly regulated nature of urban planning in London, a long wait list creates barriers for immigrant farmers seeking to cultivate land for the purpose of an urban garden/farm. The organization of farmers remains a consequence of the regulatory or non-regulatory nature of the cases of Cape Verde and London. In London, where high regulations create barriers for farmers/gardeners, a high level of organization has also fostered a sense of community and advocacy among the farmers themselves. On the other hand, in the cases where regulations are lacking, the absence of institutional support has not created the same urgencies for organization among farmers/gardeners and thus does not lead to a sense of shared goals or community among gardeners.

Regardless of official organization, immigrant-run urban gardening in multiple case studies fostered a sense of community and collective worth as a result of the presence of these practices. Even in locations where gardens were largely decentralized and lacked formal organization and institutionalization, social cohesion remained a key conclusion in the existing case studies [6]. Consistent with the literature, immigrant urban gardens in Ohio face barriers due to lacking institutional support, shifting land use priorities, as well as the nine challenges previously identified (financial, organizational structure, water, external damage, soil, communication, interpersonal issues, participation issues, and spatial).

Among the barriers that have been highlighted, this research set the purpose of analyzing gardening as a source to create economic inclusion while preserving culture to reduce poverty. By generating economic inclusion, gardening can provide an entry point into society for vulnerable communities. Economic activity is closely linked to the traditions and customs of the community stakeholders in reference. In this sense, when a gardening activity is sustainable in the medium and long term, it can provide economic inclusion and preserve culture as well. A standard expectation of societal integration often involves relinquishing cultural elements that are rooted in indigenous knowledge to assimilate into the hegemonic norms of the region. By way of food production, preservation of those indigenous onto-epistemological paradigms can be accomplished, while also providing access to economic markets.

In order to analyze whether sustainable gardening can generate economic inclusion while preserving culture, a set of in-depth interviews with community stakeholders was conducted to analyze the relationship between these three components. In particular, topics such as gardening experience, family traditions, institutional support, economic barriers, use

of technology, cropping methods, and social integration were explored. From conception to implementation and analysis, the goal of agency-building reinforced social sustainability. In addition to interpretive qualitative interviews (both in depth and informal), experiential research was conducted through a “working-with” model where the communities in reference contributed intellectual resources to the project-based research design.

This paper is structured as follows: In Section 2 we define the methodology and analyze the data, Section 3 provides the results, which are discussed in Section 4, and conclusions are characterized in Section 5.

2. Data and Methods

This interpretive qualitative study sought to explore the use of urban gardens as a source of economic inclusion, poverty reduction, and cultural preservation. Qualitative strategies of interviews and observations were utilized to collect data in the aforementioned thematic areas. Data analysis was driven by strategies of grounded theory [27,28], while also framing the findings in a case-study model exploring this phenomenon in the context of Mexico City, Mexico, and Northeast Ohio, USA. The research scheme is included in Figure 1.

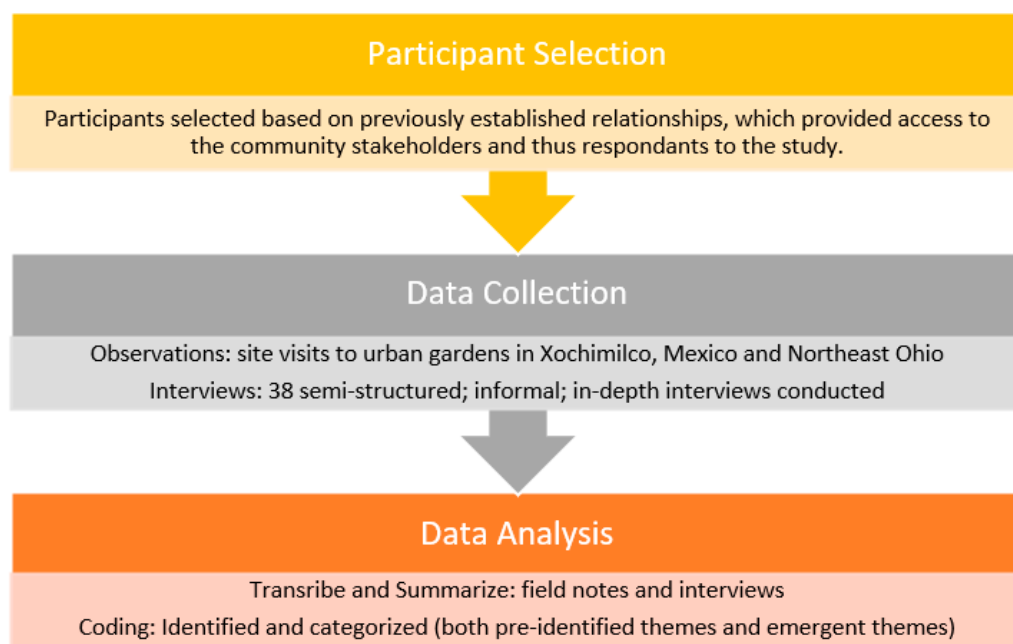


Figure 1. Research scheme.

Elements of case study design were used because it provides the opportunity to deeply analyze and investigate the specific case and context of chinampas in Mexico City and immigrant communities in Northeast Ohio. A case study allows for an in-depth analysis, without operating within the setting itself, thus presenting an opportunity for a holistic and detailed investigation of the cases with a firm understanding of the historical context influencing the spaces to be studied [29]. Further, a case study also offers the opportunity to explore multiple perspectives through multiple methods, thus deepening the overall understanding of the investigation.

The challenge of generalizability in case studies is widely accepted [30–32]. However, case studies, while not generalizable, can be used in a metaphoric sense [33]. Using case studies to identify similarities and differences is one application beyond the singular study—offering the opportunity to draw comparisons, identify successful best practices, etc. Findings and best practices from this study are envisioned to serve as examples for consideration in other similar areas. Transferability is just one example of applicability that case studies offer [33].

Interview data were collected in both in-depth and informal spaces from 38 respondents total. In-depth interviews were conducted at the site of chinampas in southern Mexico City. Respondents were selected by previously established relationships, providing access to the chinamperos and Northeast Ohio communities. Interview questions were scripted and followed a semi-structured design, thus allowing for follow-up questions and organic conversation. Twelve categories of questions facilitated the semi-structured interviews, see Figure 2.



Figure 2. Categories of questions for semi-structured interviews.

Consistent with strategies of grounded theory, the semi-structured interviews also facilitated a space where respondents could share information they felt was relevant to their experiences with the exploratory thematic categories [27,28]. The purpose of a semi-structured design is to allow for the organic flow of conversation to guide the discussion. Interviewing creates a reciprocal relationship between the researcher and subject and enables a space of understanding, observation, and learning, and holds the potential to capture the nuances of individual experiences [34]. The semi-structured design makes it possible to follow up, modify, and have flexibility around the content of each interview [35]. The semi-structured interview also helped to cultivate a space where interviewees can provide their perspectives, with the goal of uncovering a greater understanding of the interviewees' point of view [36]. Figure 3 summarizes the interview design by topic.

Observations were likewise used to gain an understanding of the experiences of gardeners themselves. In the spaces of urban gardens, visceral experiences noting the social context, physical space, economic conditions, and material resources, complement interviews to provide a more holistic depiction of the experiences and challenges facing urban gardeners. Written data alone cannot reflect an objective description of social reality [36]. Therefore, the strategies employed in this study are designed to gain a more comprehensive understanding of the respondent's experiences and perspectives. Site visits to community stakeholders included various chinampa locations in the Xochimilco region of Mexico City and Northeast Ohio urban garden network, see Figures 4 and 5.



Figure 3. Interview design.



Figure 4. Map of Xochimilco Region, Mexico City, Mexico.

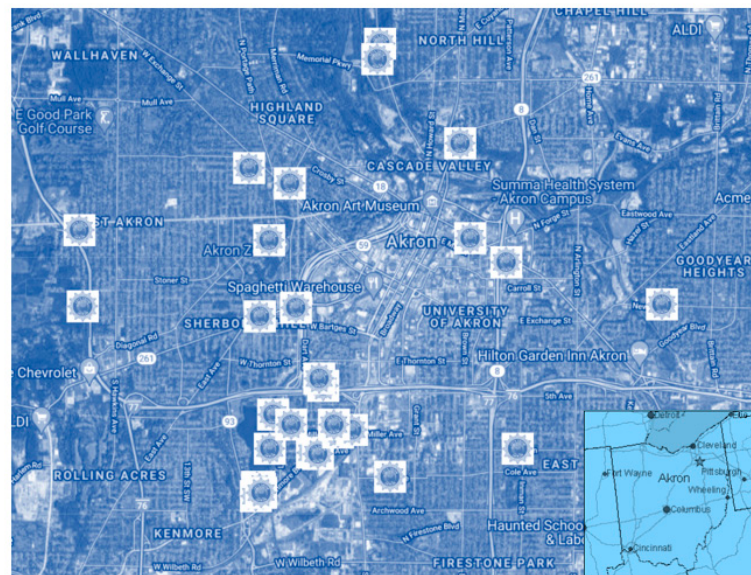


Figure 5. Northeast Ohio Urban Garden Network Map.

Analytical processing of the field interviews and observation field notes are rooted in a dual design of traditional qualitative interpretation with the previously identified themes and also allows for the emergence of new ideas and themes. Rubin and Rubin's [37] interview analysis design was closely followed, see Figure 6.

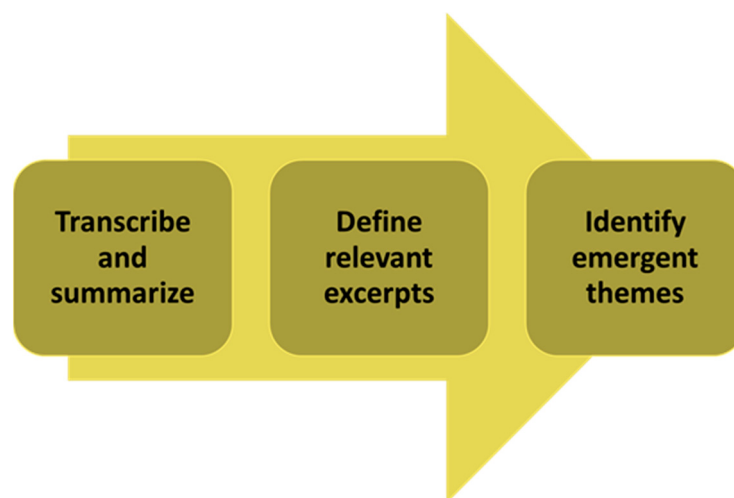


Figure 6. Responsive Interviewing Analysis.

Emergent themes were identified by coding consistencies, sorting interviews based on coding, identifying and noting consistent themes, comparing and summarizing consistencies between interview data, integrating descriptions to create a complete picture, contextualizing interview data within the analytical concepts, and noting how results may apply beyond the case study.

3. Results

Data were collected during the site visits in both communities throughout 38 semi-structured, informal, and in-depth interviews. Table 1 shows the number of responses obtained that identify a positive relationship between the categories. For example, in relation to the first category, we have responses that consider the type of cropping methods as a determinant for generating economic inclusion, or that preserve culture, or if they

help to reduce poverty; the same interpretation can be performed for all categories. The responses are divided by the country in which the interviewees garden.

Table 1. Answers in relation to the correlation between categories.

MEX USA	Economic Inclusion	Culture Preservation	Poverty Reduction
Cropping Methods	0	27	21
	0	11	4
Use of Technology	27	0	1
	11	2	2
Food Savings	0	27	27
	0	11	11
Food Sellings	0	4	4
	0	11	5
Institutional Support	4	0	0
	5	1	11
Quality of life	nd	27	23
	nd	11	4
Social Integration	0	0	27
	0	0	11

Source: Own elaboration; nd means no data; gray area represents answers under the hypothetical scenario in which, if the category were to occur, then the result would be poverty reduction.

3.1. Mexico City Case

The chinampa system is a traditional cultivation method that was used by a Mexican indigenous group to expand land territory amid the lakes and lagoons of the Valley of Mexico, where flowers and vegetables grew in the pre-Hispanic era. The word chinampa, comes from the Nahuatl chinampan, which means “in the fence of reeds”. It is an artificial farming system built in areas where water is the main natural resource present in the environment. Today, chinampas are built with the purpose of growing plants and vegetables for self-consumption and the local market. In the thirteenth century, the Aztec civilization faced food shortages, which prompted the emperor (tlatoani) Acatonalli to propose a food production technique to address the crisis. The solution involved reclaiming land from the lake with fillers of silt and sticks. Thus, the first chinampas were born in the lacustrine region of the Valley of Mexico to produce corn and various crops [38]. Information for the twelve themes emerged from the in-depth interviews conducted with chinamperos:

Culture preservation: In contemporary Mexico City, the chinampa system remains on a small portion of the historical land. Although the land use has shifted dramatically with the urbanization of Mexico City, leading to a significant reduction in available space for chinampas, the techniques and crop production remain linked to the historical traditions. Not only are chinampas an example of a small-scale agricultural system, but they are also linked to a system of indigenous knowledge and adapted technologies. The preservation of practices has been transmitted orally, passing pre-Hispanic farming techniques through generations that closely mirror the original activities. As a result, the production capacity and supply of products have been maintained over time, with four of the five main crops used by the Aztecs still found in production: corn, beans, squash, and amaranth. Themes of gardening experience and cropping methods have been preserved over time, indicating the importance of cultural preservation related to the chinampa system.

Gardening experience: Gardening in Xochimilco for families of the chinamperos is a way of life. Children are raised with knowledge of the chinampa central to their upbringing and begin helping in the production of crops as children. Priorities of child rearing in more recent generations have shifted focus toward formal education and training beyond the chinampa, with the purpose of giving children of chinamperos the choice of deviating from the traditional lineage of food production. Despite this shift, there is a trend of chinamperos who have received formal education and training in alternative fields still choosing to remain in the tradition of chinampa food production. The choice of crops is

driven by several factors including cost of seeds, seasonal availability, and preference of the chinampero and is not exclusive due to the market needs.

Cropping Methods: Food is cropped by using traditional tools and methods. At each stage of the production process, traditions have been preserved. The physical space of chinampas is not only on the historical land, with access to Lake Xochimilco, but the irrigation techniques and fertilization also follow the historical process. Despite shifts in land use, traditional techniques have been maintained in essence. Historically, chinampas were built by creating a barrier to block water from the lake, draining the space, and using the mud and silt to create a stable land mass for food cultivation. Today, amid the urbanization of Mexico City, historical chinampas have been converted to various uses (housing, commercial, etc.). As a result, today's chinampas are situated adjacent to developed land. It is projected that the current land used for chinampas will be transitioned to development projects entirely in the coming decade [22]. Despite shifting land allocation, the tradition of using mud and silt from the lake bed has been retained. Today, chinamperos use trajineras to pull mud directly from the lake to distribute it to the land of the chinampa, serving as an enrichment to the soil and also contributing to the retention of the historical method.

Use of technology: Technology use reflects the purpose and prioritization of cultural preservation related to chinampas. As land use has shifted, climate change has impacted production methods, and new technologies have been developed, chinamperos have retained traditional cropping methods. A resistance to modern technology characterizes the priorities of contemporary chinamperos. Only when necessary will modern technology be integrated. For example, water pumps have been used to assist in irrigation and ensure successful cultivation. Plastic tarps are likewise used to protect crops from increasingly harsh weather events. However, the general process uses only traditional techniques, especially related to the use of natural resources, indicating the importance of preserving the culture.

Food sales: The primary purpose in chinampa food production has changed over time. Historically, the chinampa system was the primary food source for the Tenochtitlan, necessitating resources and support for the chinamperos. Over time, however, in what today is Mexico City, urbanization, globalization, and changes in local policies especially related to massified food production have marginalized the practices of the chinampa system. Today, chinampas operate at an extremely local level, with the final consumption shifting between three economic activities: self-consumption, community trade, and market sales. The prioritization of these activities is circumstantial. For example, if severe weather conditions impact the crops, it may be more likely that the produce is kept within the chinampero's immediate family. Alternatively, if a crop is highly successful, a greater volume may be eligible to sell at the local marketplace. Trade between chinamperos is common and an indication of the collective community mindset within the chinampa system. The economic cycle therefore includes production for self-consumption, community trade, and negotiations with market dealers who buy the produce at a lower price and, in turn, charge a small fee for taking the produce to market for sale. The profit from the market remains with the dealer and the dealer determines the sale price and destination market; therefore, there is usually a disconnect between markets and chinamperos, as Figure 7 illustrates.

Furthermore, chinamperos typically prefer to self-consume the food produced rather than sell it to the markets. In fact, the priority is first for basic needs of food for the immediate family, followed by the community of chinamperos. When needed, chinamperos will buy, trade, and request seeds from within the community to satisfy their basic needs. Market sales are therefore not prioritized, which makes food savings relevant.



Figure 7. Economic cycle for crops.

Food savings: When food production is not allocated into final consumption at a market, it can be used to satisfy the basic needs of the chinamperos at a community level. In consequence, self-consumption and community trade activities represent the way chinamperos save food in order to sustain their families. This is especially helpful when there is not enough income to buy other products or when prices are increasing; therefore, instead of spending money on food, chinamperos use the latest harvest to produce their food. They also use the seeds of the previous harvest as a way to reduce production costs, diversify cropping, and maintain traditional methods by avoiding the use of genetically modified seeds.

Economic inclusion: There are several barriers chinamperos face during the cropping and selling process. The use of traditional tools and methods when cropping creates an inefficient way to produce since cropping and harvesting times are longer than in other contemporary farms. When the product is ready to be sold, prices at the markets are not homogeneous so dealers buy at the lowest price they know they can meet at any market. Thus, this impacts any possible benefit chinamperos can make due to their production. More often than expected, the food production is sold below production cost so the next crop cycle is held by previous savings or by a different species, dependent on the cost at the start of the cycle. The acquisition of another chinamapa or additional labor also represents a significant economic barrier. The added production, and therefore the marginal revenue, does not compensate for the marginal cost that rises from the salary of an extra labor unit, from the increase in cropping and harvesting times, and from distribution costs. Further, time is needed to teach the new worker the traditional knowledge and skills necessary for the cropping. Climate change has been a particular barrier since several species have been affected in a more dramatic sense, specifically in the way they usually grow. An extreme heat wave, long rain season, strong hailstorm, heavy gusts of wind, or even pests, represent a high risk of losing the entire harvest. Finally, local, regional, and national competitors are placing huge amounts of food production with very competitive prices at any moment. Under these market conditions, chinamperos cannot usually compete.

Poverty reduction: Multiple factors contribute to issues of poverty among chinamperos. Cropping through the use of traditional methods while there is a lack of technology

incorporated into food production, facing inefficient production processes, rising costs, and neither controlling final prices nor distribution channels, creates a gap between the normal poverty line set by the World Bank and the real poverty conditions chinamperos face. In 2022, the poverty line was set at 2.15 MXN per person per day [39]. Chinamperos fall significantly below this threshold, earning only 1.03 MXN per person per day. This revenue is only present when harvest conditions are likely to give a surplus that can be sold in markets; if that is not the case, then the harvest provides the necessary food for self-consumption, addressing the immediate need for food. However, the lack of surplus leads to a lower poverty line level. Poverty conditions are exacerbated because of the lack of any kind of support: institutional, political, governmental, or civilian.

Institutional support: It is very unlikely to find support for chinamperos at the institutional level, regardless if it is a nonprofit, public, or civilian organization. Public institutions tend to prioritize urbanization efforts that support massified food production. The low impact on food distribution and inefficiency of production creates a scenario where public entities lack the motivation to provide support for chinamperos. While public support could come in the form of protection mechanisms, this is also lacking, exposing the overall gap in public aid. In other cases of micro-farming communities, organization among farmers creates an advocacy net that provides opportunities to seek support. However, among chinamperos in Mexico City, this organization among community members revolves around trading crops. Formal advocacy efforts do not currently exist, nor do nonprofit entities facilitate protection mechanisms in partnership with public institutions. In particular, political support is the least interested in this economic activity since chinamperos do not represent an important portion of the voter population. On the other hand, civic organizations do not consider supporting chinampas a vital need of society.

Government support: There is no official census to determine the exact number of farmers that consider themselves as chinamperos, which is an expression of little interest for either local, regional, or national authorities. Public policies do not reach chinampas' economic activities. Social programs could support chinamperos farmers from the population-specific perspective but not from the perspective of economic activity related to farming. In the case of government spending and resource allocation, there are no current initiatives related to farming in chinampas. For this reason, it is unlikely to see taxation for the activities and therefore less motivation to provide governmental support. In consequence, this economic activity is not relevant to any public authority.

Social integration: Chinamperos face social marginalization and social exclusion. The decision to resist assimilation, especially related to food production, contributes to the lack of institutional and governmental support. These factors combined create an environment where isolation is created. From a spatial perspective, the physical land of chinampas continues to be redistributed for development projects, which pushes chinamperos to the fringes of the city in both a social and physical sense. A combination of social exclusion and lack of support and protection instigates a lack of trust between chinamperos and broader society. Educational attainment gaps are a result of the lifestyle and prioritization of chinampa cultivation. With few exceptions, this deficit in educational attainment compared with the regional average serves as a contributing factor to social exclusion and creates a barrier from a socioeconomic perspective. Inconsistencies in food production and lack of visibility at markets and other public spaces lead to an overall lackluster awareness about chinampas. This lack of awareness prevents civilian support from emerging. Socioeconomic integration is negatively impacted due to variable incomes, which are often below the poverty line, education attainment gaps, idiosyncrasies of the community with regard to lifestyle choice, lack of access to basic financial instruments, lack of organization as it relates to the community and also within markets, and unequal negotiations with dealers, merchants, and businesses. These factors cause a low, if not null, social integration; which can be exacerbated because new generations do not consider urban gardening as a profitable way of life.

Quality of life: As a consequence of all the aforementioned factors, it can be concluded that the standard of living from a socioeconomic lens for chinamperos is not high. Having no control of the product price, no access to markets, no regular revenue nor access to financial instruments, and therefore being economically excluded from the entire system, causes the quality of life for these farmers to be very low. Furthermore, in the worst-case scenario, natural and environmental factors, such as harsh weather and climate change, can affect the harvest so badly that self-consumption of food in bad conditions is likely to occur.

3.2. Northeast Ohio Case

In the case of immigrant urban farms in Northeast Ohio, multiple consistencies can be drawn, but significant differences likewise emerge. While the massification of food production is in process in Mexico, corporatization of food in the United States dominates public policies, agricultural activities, and economic implications. A noteworthy distinction between the two cases identified in this study is the purpose of gardening activities. In Mexico, chinampas represent subsistence farming, where the primary purpose is self and community consumption. Contrasting this is urban gardens in the United States. Specifically, immigrant urban gardens in Ohio serve as a resistance to the corporatization of food production and highlight educational elements in this regard as part of their activities. Shanti Community Farms is an urban gardening nonprofit organization that seeks to empower the growing immigrant community through educational and environmental programs. Their physical space includes a one-acre urban farm, a greenhouse-style tunnel, and several smaller garden plots throughout Akron, Ohio. Situated in North Hill, Akron's "international neighborhood", Shanti Farms works in partnership with city officials, other gardening nonprofit organizations, support agencies for the immigrant and refugee communities, universities, schools, places of worship, and individual families. The immigrant community in reference is comprised of families seeking refugee status, those who have acquired refugee status, undocumented families, asylum seekers, and individuals with various other visa statuses. The twelve categories previously mentioned help to draw the distinctions and similarities, while also identifying best practices and room for opportunity.

Culture preservation: Most farmers, in particular, the ones with refugee status, incorporate traditions into the food production process. It is not only the method they use, but also the type of food they crop that could rely on traditions. Several farmers use native crops coming from their home countries along with several other local crops. Cropping methods that are close to traditional methods normally employ tools and inputs in a traditional way as well. Furthermore, several species are traditionally transformed to be processed into a final product that is sold in markets. The primary goal of Shanti Community Farms is cultural preservation. Not only are the organizational leaders providing educational programs related to culturally inclusive food production, they are also incorporating generational elements so that elders of the immigrant community can share their working knowledge of agriculture with the upcoming generation. The locations from which immigrants in North Hill originate are primary economies. However, after migration or resettlement to an urban location such as Akron, many of these agricultural traditions become impractical and sometimes impossible to maintain. Shanti Farms, therefore, addresses this issue by providing spaces for generational learning related to agricultural and other cultural fixtures. Because the immigrant community is geographically diverse, cross-cultural learning also results from an organization of this kind. At one location, an "International Peace Garden" is separated into thirds that represent each distinct immigrant community—Central Africa, Nepal/Bhutan, and the Middle East.

Gardening experience: Like chinamperos, immigrant farmers in Northeast Ohio have previous experience due to either urban gardening or rural farming in their home countries, which has been learned from their ancestors. This experience is integrated with the knowledge of how to use a particular crop, what kind of tools are needed, and which specific cropping method is necessary to grow a certain crop. For many families, challenges are faced because the resettlement to Northeast Ohio has resulted in very different

environments to manage from environmental and agricultural perspectives. Climate differences, exacerbated by climate change, are a barrier for immigrant farmers who come predominantly from warmer climates. Additionally, differences in soil and the type of crops that successfully grow in Ohio's climate are likewise adjustments that most farmers need to make after relocation. Generational learning is vital to maintaining and passing gardening knowledge from immigrants who were born and raised in their country of birth, versus children who relocated at a young age or were born in the United States. Issues of assimilation and loss of traditional knowledge are present in the younger generations, creating a need for environmental learning.

Cropping methods: Most farmers use traditional planting methods, according to their customs, with the necessary use of technology to carry it out efficiently, but only when strictly necessary. Seeds of species that are in season are often used to take advantage of the production process, particularly in terms of cost. The selection of the products can also be done with the objective of complementing a basket of products, or taking advantage of a mixture of the same product to produce a variety of final products for the market. The choice of land, the irrigation system, the use of compost or pesticides, as well as the harvesting method are directly related to the tradition of the economic activity in question. Nearly all farmers in the cases identified cultivate by hand.

Use of technology: Technology is used in the production process as long as it does not substantially modify the process and, therefore, the quality of the product. In some cases, the use of tools, machinery, and equipment, etc., is necessary to improve the production process, which usually translates into a drop in production costs. In general, there is an openness towards the use of technology; however, the main barrier is inadequate financial resources to access it.

Food sales: In Ohio farms, produce sales have many facets. A network of 30 gardens in Akron coordinate several purposes for food sales. The first purpose is to address food security needs. Many of the gardens in the aforementioned collective are located in underserved, under-resourced neighborhoods, many of which are considered "food deserts" due to their very limited access to fresh produce. Secondarily, urban gardens serve as a source of resistance to massified food production. The collective of gardens in Akron are organic, locally consumed, provide educational opportunities for families who wish to start their own home garden, and sell the produce at accessible prices in local farmers markets (both informal at the neighborhood level and formally at the city level). Finally, immigrant farms are serving as a source of culturally relevant food, thus accessing a market whose options are quite limited in terms of indigenous produce. Some of the production is purchased by nonprofit organizations with the aim of redistributing it in low-income communities, especially where access to markets is very limited due to transportation or distance issues. These organizations have developed distribution processes throughout the main marginalized neighborhoods. The second most common way of selling food is through community markets, which are established once a week, with Sunday being the most common day. In these markets, all the production is offered at accessible prices, which also compensates production costs; there are usually profits, but minimal. Some farmers have developed membership schemes under which they sell their produce to families who pay a monthly fee in exchange for receiving a basket with different products on a regular basis, usually once a week. The production is also used as an intermediate input to produce other types of goods, for example, jams, sauces, oils, soaps, creams, etc. Some farmers sell these products from their home garages or other makeshift spaces in their yards. Generally, the purpose of food sales is not to profit but to address other needs.

Food savings: Food production on these farms is often used for direct sale or for distribution within the communities; however, there are small farming communities that may use some of the food for self-consumption or to trade with other farmers. For example, those who sell their produce under a commodity basket scheme often agree with other farmers to complete a basket containing produce from various farms. Self-consumption is present but in very low proportions. In addition to immigrant gardens, ethnically relevant

restaurants also have a strong presence in North Hill, which compared with Akron has a 12.5% higher Asian demographic and a 4% higher Hispanic demographic. As a result, self-consumption often comes after surplus produce sales to local ethnic restaurants. Because immigrant gardens are producing indigenous crops, saving and reusing seeds is one way to sustain the practice because sourcing the seeds can be challenging.

Economic inclusion: Food production is very efficient on these farms. Production costs are only subject to changes in inflation, but do not change very drastically by other factors. Production times are also standardized, especially due to the use of technology when it is required. The quality of the food produced is usually very high, but the volume is low compared with small, rural-type farms. All of the above means that the production cost is not very high and, therefore, setting an accessible final price for final consumers is not complicated. Having control on the final price makes it easier to sell the production in community markets or within organizations that distribute food. Most farmers have profits that are usually reinvested in the next period's production. Farmers also have access to some programs primarily sponsored by universities, foundations, or other nonprofits. In fact, many gardens' primary source of financial resources comes from sponsored funds in the form of grants. With resources from these organizations, farmers acquire seeds, tools, or any other necessary input for the production and distribution of the produced food. Despite all of the above, the level of economic inclusion is not what is desired for these communities. Due in part to the competition created by corporatization of food production, urban gardens do not serve as the primary food source for the city or even the neighborhood. Rather, they serve as a supplemental source of culturally relevant food, and in some cases, fresh food in neighborhoods that do not otherwise have access to produce. Access to financing through commercial banks is rare and most of the investment in these farms comes from donations they receive. In particular, this economic activity represents a real job opportunity, and is therefore income related, for refugees.

Poverty reduction: The main reason for this economic activity in Ohio is not based on profit but on food production to help people with low resources. Most farmers carry out this economic activity in addition to other income sources, such as another job or a business. Consequently, the obtained income from product sales complements the total income. The main benefit in terms of poverty reduction does not come from income generation, but from food distribution to households, in particular, the ones that do not have enough resources to buy food in an established market at more expensive prices. It is in this sense that poverty reduction occurs.

Institutional support: A strong presence of nonprofit organizations serves as the main institutional support for immigrant urban gardens. In the case of Shanti Community Farms, the organization itself plays a role in multiple facets of life, not just food production. In addition to the plots of land dedicated to food, Shanti Community Farms also serves as a source of cultural learning and provides opportunities such as cultural dance, community events, educational support, and youth programs. The organization is primarily funded by grants and led as a secondary endeavor to full-time employment for executive management. A deep network of collaboration is present between urban gardens, the organizations that support them, and the families who work the land. The collective mindset creates a safety net of social and economic needs and also provides a sense of shared purpose related to the activities of the garden network. Beyond the immediate gardening community, support also comes from local partnerships. For example, local schools and universities partner with the gardens for the purposes of farm-to-school food production programs, environmental education efforts, and physical needs such as composting. Local partnerships of this kind provide additional support beyond monetary resources, which contributes to the purpose of the gardens themselves as a fixture of the local community. The more partnerships are established, whether with schools, foundations, or within the gardening community, the more likely it becomes that the gardens will receive government support, which generally speaking is lacking.

Government support: Similar to the case of Mexico City, government support is the least present and least likely. This is in part due to food distribution priorities related to city planning and policy. It is far more likely for city policy in any U.S. urban center to follow trends of corporatization, planning entities like supercenters, which will increase overall economic activity city-wide, rather than investing in small-scale production that does not serve a primary purpose of turning a profit. While government social service policies are available to families, especially low-income families, support more generally for urban gardens themselves would come in the form of city foundation grants. If a farm is registered as a charitable organization, they are subject to tax exemptions.

Social integration: In contrast with the chinamperos of Mexico City, social integration of immigrant farmers takes place to a much greater degree. This is in part due to the spatial placement of the urban gardens in reference, many of which are located in Akron's "international neighborhood" of North Hill. Because the surrounding neighborhood has a significantly diverse population, social integration does not tend to face the same issues as other neighborhoods that are predominantly white and therefore face racial/ethnic exclusion. In addition to natural integration because of the population demographics, there is also a more integrated network of nonprofit organizations, faith-based organizations, and civil society entities that partner with and therefore provide access to immigrant gardens beyond the gardening community. Finally, partnerships with local schools, universities, and other public entities help to mitigate buy-in from the city. Overall, the collectivity of the urban farming community helps to mitigate issues of safety, youth violence, poverty, and education. In the case of Shanti Community Farms, the programming addresses all of the above issues, not just agricultural or environmental learning but also a broad reaching social support that creates a sense of purpose within the community.

Quality of life: When considering the above factors, quality of life among immigrant farmers, especially by comparison to chinamperos, is reasonable. Although from an economic measure much of the community is considered "low income", the overall quality of life considers a more comprehensive set of considerations. When taking into account the access to culturally relevant food and activities, the deep network of collective social protections, and support programs including educational, financial, and cultural, a sense of dignity and self-worth emerges within this community. Further, despite issues of economic marginalization, the goal of immigrant urban gardens is not profit-driven and therefore should be considered among other factors when analyzing quality of life. A more comprehensive scope of quality of life determines that immigrant farmers maintain a dignified and satisfactory lifestyle.

4. Discussion

It is evident that urban gardening represents a way in which the cultural roots and traditions of a people can be maintained. In most of the analyzed cases, the selection of the type of crop, the planting method, the tools used, and the way of cultivating are directly related to the culture and traditions of the farmer, regardless of whether the farmer is a migrant or not. Further, in addition to the method by which gardening is conducted, the motivation and purpose in seeking this lifestyle is intimately linked to the idea of cultural preservation and maintenance of traditional ways of producing food. This economic activity becomes more relevant, in terms of culture preservation, when the knowledge about the cultivation method has been transmitted from generation to generation. In all locations, it was identified that urban gardening has a growing importance as knowledge is transmitted through a greater number of family generations.

This implies that, over time, this activity loses relevance in economic terms and increases its value in cultural terms. Furthermore, it is highly likely that a family will decide to continue gardening, thus preserving the traditions, even though the income it generates is very low. Other non-nuclear members of the family can join in the gardening work if there is a risk that a member of new generations decides not to continue with this activity. Finally, urban gardening helps to mitigate the effects of climate change, regulates the

urbanization of rural areas, and builds environmental education across generations, which is also part of the traditions, especially within chinamperos and accordingly with [16–18,23], thus creating environmental awareness.

Practices of urban gardening represent a strong expression of values, traditions, and cultural beliefs of the family and cultural community. Within small farming communities, this cultural expression generates a degree of identity and provides social cohesion exclusively for the people who carry out this economic activity. Although there is a level of marginalization from the broader society (the case of Mexico City to a greater degree than the case of Ohio), cohesion and collectivity within the farming community compensates for the consequences of societal marginalization; this effect is also known as sociability [19,20]. This finding is consistent with the results presented in [10–12]. Likewise, it represents an opportunity to have an income, in some cases in addition to the main source, as well as an employment alternative, albeit marginal at best. Because the prioritization is preservation of culture, rather than generating income, this employment alternative effectively maintains ancient traditions. Although this type of community is not usually fully integrated with the rest of society, internally in the farming community a sense of belonging is generated through the culture involved. Likewise, the collective mentality within the community itself contributes to the sense of purpose and also belonging experienced by the farmers. This belonging materializes when the products are sold in local markets or traded among farmers, when they are redistributed among very poor households, or when they are used for self-consumption.

In both locations, it was identified that the use of technology can negatively affect cultural preservation, especially if it substantially modifies the process of growing food. Technology can be used for aspects of little relevance during production, such as irrigation, storage, or transportation of the product. However, the use of technology to improve cultivation, harvesting, food quality, growing time, etc., represents a serious threat to the preservation of traditions. Specifically, the use of genetically modified seeds is also considered as an element that modifies the tradition. Although agricultural technologies could dramatically increase production, the priority in the cases of this study is not production value, but rather the cultural elements and preservation of tradition. Slightly different outcomes were discovered in the two cases. For chinamperos, resistance to modern agricultural technologies is a matter of great importance with regard to food production on chinampas. For this reason, a central component to their food production is the resistance to technologies. In contrast, the use of technologies in Ohio is more nuanced and informed by a number of factors including access of financial resources to invest in agricultural technologies, as well as cultural elements such as prioritizing naturally grown food free of pesticides and genetic modifications. Despite slight differences in motivation, lack of technology was a consistent factor in all cases.

Urban gardening as an economic activity has several restrictions. Given the volume of production, which is usually on a very small scale compared with the massive production of food carried out by corporations, production costs tend to be highly variable, thus making the activity unprofitable. The high prices of inputs accompanied by the low use of technology can cause high production costs for cultivation, harvesting, and even the distribution of the food produced. On the other hand, facing competitive prices in institutionalized markets is very common. Mass production, which takes advantage of economies of scale, is usually at very low cost, thus depressing final prices. In the case of urban gardening, economies of scale are usually not present, so the increase in costs is always expressed in a final price that may not be competitive. This puts the economic viability of the activity at risk because the product is sold at a price below the recovery cost, or it is not sold and is used for self-consumption and trade within the farming community. In either of these two scenarios, the corresponding income from the harvest would be lower than expected. In most cases, the farmers do not control the determination of the final prices and the market conditions they face.

As economic activity is not usually profitable, it is not visible and therefore not a priority for the main economic and social agents: companies, banks, government, etc. This implies that farmers cannot have economic support, tax incentives, or even access to financing instruments, simply because their income level is not adequate. More specifically, income within this economic activity is neither constant nor growing; the profit margin is extraordinarily low, if it exists at all. The production generated by this economic activity is only known within the farming communities, the families that participate in them, and the households that benefit from the distribution of products. Due to their volume of production, the narrow size of the market they have, the limited influence on the market, the low number of producers and their null specific weight in terms of the vote, this type of community does not have significant support from the institutions in any level: local, regional, or national. Given these factors, the degree of economic inclusion in these agents is very low, and in some cases null.

Based on the evidence of the two cases, the primary motivation for urban gardening is driven by desires for cultural preservation rather than economic factors. Despite providing a nominal source of income (in some cases secondary to the main source of employment), the communities analyzed can both be categorized as low income. Issues of poverty are prevalent in both cases, creating a scenario where the purpose in food production is not only driven by cultural elements, but also the need to address food insecurity. Especially when self-consumed, and highly relevant when situated in a food desert, small-scale urban farms can serve a dual purpose and at times as a secondary motivating factor of subsistence. The low-scale food production due to the twelve dimensions previously highlighted has a very low impact, imperceptible, but present in the wealth of certain sectors within the community. Having self-consumed food indirectly alters family income. Trading crops among the community of farmers helps to improve the satisfaction of basic needs. Distributing food at very affordable prices to low-income households indirectly modifies income and quality of life. These three factors are consistent with the findings in [14,15]. However, these three expressions of this economic activity do not reduce poverty essentially because of the scale of its magnitude. These twelve dimensions are in addition to the six principle objectives identified by [13] and part of the nine challenges defined by [21].

Issues of poverty are the result of structural issues, with an underlying factor being a lack of institutional and governmental support. In addition to a lack of support, there is also an absence of protection to maintain the traditional practices in these communities. When these factors are considered holistically, it can be determined that gaps in institutional support contribute to social and economic marginalization, thus adding to issues of poverty. Despite the lack of institutional and governmental support, organization among farmers and partnership with nonprofit entities can contribute to the sustainability and overall success of the enterprise. These results are consistent with [9–11] in the sense that in Ohio gardens the presence of this kind of support helps to create social cohesion. In contrast, the case of chinamperos exposes issues that arise due to a lack of organization and community-level advocacy, further validating the assertions of [9–11]. City policies in each location clearly prioritize the corporatization of food production, which places significant barriers to the success of gardening practices. Massified food production more generally, complemented by urban development priorities, creates a bleak future for urban gardens. However, the collectivity, sense of identity and cohesion within the community, and growing nonprofit organizational support of urban gardening efforts can help sustain the future of these practices.

Some Reflections

One of the primary barriers facing small-scale agricultural activities exists at the institutional level, where government entities continue prioritizing corporatized and therefore massified food production. Because of this prioritization, urban and city planning reflects the spatial orientation of land use, impacting negatively the options and geographic sustainability of urban gardens. The presence of urban gardens has clear benefits within the

scope of corporate food production. Access to fresh food, cultivation of culturally relevant crops, and pesticide-free and genetically modified organism (GMO)-free produce are all outcomes of urban gardens that will hold increasing importance as corporate food production grows; which agrees with similar studies [40–43]. In contrast, negative consequences of massified food production are clear. Health and wellness implications, climate destruction, and politicization of the food production process are just a few of the factors to consider when identifying the broader purpose in small-scale urban farming. For these reasons, institutional and governmental support is necessary to sustain the future of urban gardens. With moderate nonprofit organizational support, it is clear that immigrant urban gardens witness short-term successes.

Institutionalized and consistent support from government and other public entities could be transformative to the future of immigrant urban gardens. The lack of organizational support and advocacy among chinamperos in Mexico City expose the risks of operating without a protection mechanism. The gap in any kind of support (governmental, institutional, and organizational) implies a future where chinampa farming will have very few options to sustain the practice. These two cases illustrate the need for various levels of not only support but also protections. Naturally, with support and protections in place, highly localized positive economic outcomes within urban farming communities will result, in accordance with [40,41,43]

Sustainability in these cases clearly depends on the presence of economic inclusion and, therefore, the reduction in poverty, as well as the preservation of culture. Economic inclusion necessarily implies the generation of much more efficient and profitable production and distribution conditions. Without the objective being the mass production of food, optimizing planting and harvesting times, increasing the volume of the product, incorporating a specialized and trained labor force, using technology that allows reducing production costs, and maintaining control over final food prices are relevant aspects that these economic agents must consider in order to improve their income level due to this economic activity; if they did, their economic inclusion would increase, similar to the result in [40,41,43]. If a farmer is capable of making the production process more efficient, as well as understanding the functioning of the market and knowing and innovating the ways of placing their products so that the rest of society finds them attractive, then the socioeconomic conditions of these agents would undoubtedly improve. Naturally, when economic inclusion is accomplished, conditions of poverty will inevitably decrease.

Economic sustainability, which is characterized by an invariable improvement in production processes, a growing and constant level of income, and the uninterrupted satisfaction of needs, is a fundamental element for reducing poverty levels. Clearly, economic sustainability is also the path to economic inclusion and poverty reduction.

For urban gardening to be environmentally sustainable, in addition to generating economic inclusion, it must respect and promote the precepts of caring for the environment. At the same time, it must preserve the customs and traditions that have been part of this activity for centuries. It is no coincidence that traditional agricultural practices are more environmentally conscious. Generally speaking, indigenous ways of knowing link the epistemic foundations of the community to the ontological experience within the natural environment. Especially present with regard to cultivating food, an act that serves as a bridge between the natural and human experience, traditional agricultural methods reflect this connectedness between humans and the land. The type of crop, the planting and harvesting method, the irrigation system, the use of pesticides and fertilizers, the incorporation of technology, and the distribution methods must be consistent with caring for the environment. This is a characteristic feature that is always present in the two cases of urban gardening that were analyzed. Furthermore, environmental awareness is a fundamental part of the ancestral motivation for carrying out urban gardening; the knowledge transmitted from generation to generation has always included the preservation of the environment. It is no coincidence that the culture built centuries before, within these communities, is composed of a profound awareness of natural resources.

Sustainability comes in multiple forms when analyzing the two cases of this study. Economic, cultural, geographic, and environmental sustainability all emerge as relevant themes and likewise areas for future research. Recommendations related to sustainability, broadly understood, can be imagined in two senses. First, there is a need to identify solutions, especially related to economic inclusion/poverty reduction within the current hegemonic space of food production, that is, recommendations for small scale agricultural activities that will address sustainability needs within the realities of food corporatization/massification should be established. In a more theoretical sense, solutions can be imagined that include a revolutionary shift in the current food production paradigm, similar to findings in [40,41,43].

Under the current model, where corporations involved in food production, processing, and distribution continue to consolidate, leading to what is known as “Foodopoly”, small-scale urban gardens must consider access points to local economies as a source of sustainability. Inevitably, an increase in both technology and production will be necessary to compete in any real sense with massified food production.

5. Conclusions

In order to understand if the preservation of culture, economic inclusion, and poverty reduction are determining factors for the sustainability of urban gardening, twelve different components that are characteristic of the mentioned economic activity were analyzed. Through in-depth interviews and using principles of grounded theory, the main characteristics of the two case studies included in this research were identified, the chinampas in Mexico City and the immigrant urban farms in the state of Ohio, United States.

Findings show that when food production is rooted in family traditions, economic activity occurs within a framework of cultural meaning and therefore deepens the social and economic value. Despite barriers to economic markets, stakeholders nonetheless remain committed to traditional gardening practices because of the social value generated and the desire to preserve their culture. The main sources of economic barriers are mass production and the corporatization of food, long harvest times, high production costs, low prices, low revenues, and shortage of a specialized labor force, which lead to issues of unsustainability. In addition, resistance to agricultural technologies is an outcome of both economic barriers and a commitment to cultural preservation due to the high cost and the break in traditions it represents; resistance to agricultural technologies likewise causes cropping methods to be inefficient.

The lack of institutional support exacerbates the social and economic vulnerabilities of the stakeholders, even when gardening practices create social cohesion within the gardening community among farmers, but stakeholder communities remain marginalized from the broader society. In consequence, social integration has less impact.

Specifically, the following recommendations can be made based on the best practices that were identified during this investigation. Farmers can try to anticipate the crops that, based on the seasons, will be in greater demand within the communities, thereby trying to obtain advantages in production costs and, therefore, in the level of income. Likewise, farmers can use more efficient cultivation and harvest processes with the appropriate use of technology to optimize production times and volume. Furthermore, farmers can make agreements with other farmers for the production of complementary foods among themselves, in such a way that they can take advantage of some economies of scale and generate baskets of seasonal products to sell to society.

Diversification in food manufacturing can be accompanied by a diversification of the business model, particularly regarding the way of selling; memberships, product baskets, and food packages that complete a list of ingredients for a particular recipe are some good practices that can be replicated in order to increase sales. Community spaces can be utilized for the regular sale of products, which are widely recognized by the rest of society as markets that offer quality products at low cost. Farmers can establish alliances with businesses close to the food industry to expand the range of sales and publicize their products. To

realize these recommendations, a necessary increase in the organization among farmers must take place. Collective planning and action will yield positive results and, as a result, increase the overall circumstances of farmers. The aforementioned recommendations are possible with realistic shifts in strategy and can take place without significantly impacting the current practices, nor requiring major changes in the food production system itself.

Albeit less pragmatic, a reimagining of how we grow and access food can serve as a theoretical guidepost. Because themes of cultural preservation emerged as the primary purpose in the two cases of small-scale agricultural activity analyzed, points of connection between food and culture are evident. While short-term solutions may be possible within the current food regime, long-term implications, especially with regard to environmental sustainability, require a more radical paradigmatic shift. In highly localized spaces, the case of chinamperos of Mexico City and immigrant urban farmers of Ohio serve as examples of how small-scale food production can address many of the negative consequences of massified food production. Currently serving a purpose with limited reach addressing a need for culturally accessible food and food insecurities, the model of urban gardens, with the proper institutional support and protection, can be implemented in any locality.

When imagining a reality where food production was primarily sourced in highly localized spaces, urban gardens have already provided a successful model. However, a deconstruction of interconnected factors of economic growth over environmental degradation must precede shifts in policy toward growing and protecting small-scale agricultural operations. In the absence of food corporations, or with dramatic limits to their scale and reach, urban gardens could serve a purpose with much deeper relevance for local communities, ultimately serving as the primary food source. In addition to cultural implications, environmental sustainability will also serve a central purpose in this radical reimagining of food access. The climate destruction caused by corporatized food can actually be reversed by way of small-scale agricultural solutions such as urban gardens. To accomplish this reality, societal pressure is necessary to foster the political will to act in accordance.

The main limitations of this research are as follows. Due to the limited scope of two case studies, the resulting data are not generalizable to other cases of urban gardening or small-scale agricultural activity. In this sense, it is necessary to extend the sample to other urban gardening spaces. Sustainability can be achieved through economic inclusion, poverty reduction, and cultural preservation, but they are not the only elements that can generate sustainability in this economic activity. Education, health, labor market, and even religion can be aspects that affect the sustainable performance of a garden.

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