

12-1-2019

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Recommended Citation

Kopyawattage, K. P., Warner, L. A., & Roberts, G. T. (2019). Barriers to Urban Food Production: Perspectives of Urban Food Producers. *Journal of International Agricultural and Extension Education*, 26(3), 147-161. DOI: <https://doi.org/10.5191/jiaee.2019.26310>

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Abstract

Locally grown food systems in urban areas is globally important for numerous reasons such as food security, nutrition, financial well-being, and solutions to the many complex issues observed in areas with increasing populations. An understanding of the barriers to urban food production is needed because, if not addressed properly, they may lead to severe threats in urban communities such as food insecurity and poverty. The purpose of this qualitative study was to identify the barriers associated with urban food production. Semi-structured interviews were conducted in Columbus, Ohio, U.S.A. to collect data. Rules and regulations from city ordinances were perceived as the greatest barrier to urban food production. Negative perception towards farming, lack of marketing options, and resource scarcity were also identified as strong barriers to urban food production. Revisiting city ordinances, creating more market options for urban food producers, and directing programs, networks, organizations, and responsible people towards urban farming are recommended to eliminate barriers to urban food production. International agricultural and extension educators may consult the barriers identified in this study and use the findings as a starting point from which to support urban food production.

Keywords

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doi: 10.5191/jiaee.2019.26310

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Locally grown food systems in urban areas is globally important for numerous reasons such as food security, nutrition, financial well-being, and solutions to the many complex issues observed in areas with increasing populations. An understanding of the barriers to urban food production is needed because, if not addressed properly, they may lead to severe threats in urban communities such as food insecurity and poverty. The purpose of this qualitative study was to identify the barriers associated with urban food production. Semi-structured interviews were conducted in Columbus, Ohio, U.S.A. to collect data. Rules and regulations from city ordinances were perceived as the greatest barrier to urban food production. Negative perception towards farming, lack of marketing options, and resource scarcity were also identified as strong barriers to urban food production. Revisiting city ordinances, creating more market options for urban food producers, and directing programs, networks, organizations, and responsible people towards urban farming are recommended to eliminate barriers to urban food production. International agricultural and extension educators may consult the barriers identified in this study and use the findings as a starting point from which to support urban food production.

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Introduction

The need for a locally grown food system in urban areas has increased as modern food systems have become more complex and challenging. Agriculture has diversified into mechanized, industrialized, and large-scale practices with the extensive use of irrigation, chemicals, and fertilizer (Beus & Dunlop, 1990). Growing food requires operations such as transportation, packaging, and processing, which create distance between producers and consumers (Blay-Palmer, 2008). To maintain a continuous supply of food to consumers, a massive transportation network is required (Barker, 2002; Blay-Palmer, 2008; Viljoen, 2005). Water pollution, soil erosion, chemical residues in food, and degradation of air quality due to massive transport networks are some of the many negative results of industrialized agricultural systems, which creates sustainability problems in urban ecosystems (Horrihan, Lawrence, & Walker, 2002). Therefore, the need for a locally-grown food system has been highlighted especially in urban areas where there is an opportunity to improve the supply of fresh and nutritious produce to consumers and processors (Blay-Palmer, 2008; Kloppenburg, Hendrickson, & Stevenson, 1996). According to the World Bank (2008), the world will need 70% to 100% more food by 2050, in order to feed 9 billion people. As the planet's global population grows, the number of people living in urban areas is also increasing.

A food system is the “combined elements of food production, processing, distribution, preparation, and consumption” (Gregory, Ingram, & Brklacich, 2005, p. 6). Food systems vary from simple to complex. An example of a simple food system is subsistence farming while mono-crop cultivation for exportation is an example of a more complex food system (Gregory et al., 2005). The Food and Agriculture

Organization of the United Nations (1996) defined food security as “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (p. 3). The world's small and medium cities have become the home for about 61% of the urban population, which often lack basic facilities and infrastructure to meet the needs of growing number of people (Montgomery, 2008).

The demand for food increases along with population growth, adding extra pressure to existing food systems. Therefore, matching the supply and demand for food, producing food in environmentally- and socially- sustainable ways, and ensuring that people are no longer hungry are threefold challenges faced by most of the urbanized countries in the world (van Braun, 2007). In the past, food challenges were overcome by bringing more land into agriculture. But with increasing population and urbanization, most of the productive agricultural land has been lost (van Braun, 2007). Therefore, if not addressed properly, urbanization may lead to severe threats in urban communities such as food insecurity and poverty. In this context, identifying challenges and barriers faced by urban food producers is an important step needed to help international agricultural and extension education professionals take actions to facilitate food production in urban areas.

Theoretical Framework

Attitude is a strong predictor of behavior across different agricultural contexts such as food consumption (Spence & Townsend, 2006), environmental conservation (Borges, Lansink, Ribeiro, & Lutke, 2014; Wu & Mweemba, 2010), and environmental activism (Kelly, 2008). The Decomposed Theory of Planned Behavior (DTPB) provides a way to better understand

the effects of specific factors, such as attitude, on behavior. DTPB was developed using the Theory of Planned Behavior (Ajzen, 1991) and the Diffusion of Innovations theory (Rogers, 1983, 1995). The “DTPB was designed to explain the complex factors that influence an individual’s behavioral intention leading to actual behavior” (Amundson, 2014, p. 48). In the DTPB, the belief factors (attitude, subjective norm, and perceived behavioral control) are decomposed into specific multi-dimensional belief constructs based on their characteristics, causes, and outcomes.

Taylor and Todd (1995) discussed three of the five attributes of an innovation used in the Theory of Diffusion of Innovation: relative advantage, compatibility, and complexity. Moreover, perceived behavioral control used in TPB is also expanded in the DTPB to demonstrate the influence of efficacy and facilitating conditions on perceived behavioral control. As stated by Shin and Fang (2004), self-efficacy of an individual is referred to the level of comfort associated with using an innovation. Availability of resources that affect an individual’s behavior is represented by facilitation conditions (Ajzen, 1985, 1991). Taylor and Todd (1995) in the DTPB, identified challenges and barriers to performing a behavior as a strong determinant of attitude towards behavior. The more an individual perceives adopting a given behavior to be difficult the more negative that individual’s attitude towards it (Rogers, 1983). Therefore, exploring perceived challenges and barriers associated with urban food production is helpful to predict future behavioral intention of urban food producers to continue farming in urban settings.

Land use restrictions have been identified as one of the prominent barriers to urban agriculture (Hodgson, Caton-Campbell, & Bailkey, 2011; Kaufman &

Bailkey, 2000; Vitiello & Wolf-Powers, 2014). “Zoning and land use regulations are undoubtedly one of the most important tools for promoting and controlling urban agriculture in a city” (Vickery, 2014, p. 21). Zoning ordinances and the rules and regulations attached to them vary from city to city and country to country. In the above-mentioned studies, the researchers explored how rules and the regulations attached to zoning made it difficult to practice agriculture in urban areas.

Scarcity of natural resources is another barrier for urban food production. Smit, Nasar, and Ratta (2001) identified proximity to densely populated areas as a barrier for urban food production due to polluted water, air, and soil. Since access to lands and availability of lands are limited in urban areas, producers had to keep their livestock and grow their plants in polluted environments. Hendrickson and Porth (2012) noted access to water is difficult for urban producers because of the cost of installing water lines and paying for water at retail rates.

Access to capital and funds is another barrier for urban food production (Hendrickson & Porth, 2012). Oberholtzer, Dimitri, and Pressman (2014) conducted a national survey to identify characteristics, challenges, and technical assistance needs of urban farmers in the United States and identified production cost as the greatest challenge to urban food production. Some cities such as Minneapolis, Baltimore, and Cleveland have taken different initiatives to address these problems by offering small grants and low-interest-rate loans. As reported by Hodgson, Campbell, and Bailkey (2011), “despite opportunities to include urban agriculture activities in new and existing public housing, schools, and other civic spaces, the Environmental Protection Agency, the Department of Housing and Urban Development, and the

Department of Health and Human Services offer little to no financial support, although this is slowly changing” (p. 34).

Another barrier to urban agriculture is concerns from the neighborhood regarding living near an urban farm. Unlike rural farms, which are located away from residential areas, urban farms are closely located to residential neighbors. Kim, Poulsen, Margulies, Dix, Palmer, and Nachman (2014) indicated that some urban producers are unaware of the negative health effects of water and soil contamination, ground and air pollution, harmful chemicals, waste materials, and loads on the sewage system. These potential risks associated with urban farming lead to negative concerns in the neighborhood.

Urban farming is relatively a new concept around the world and many producers who are involved in urban food production are new to agriculture (Oberholtzer et al., 2014). In addition, extension personnel working in urban areas may be relatively new to the concept of urban farming (Diekmann et al., 2016). Poor extension service has been identified as the major limitation for promoting agriculture in urban areas in Sri Lanka (Karunadasa, 1998). Therefore, with both food producers and service providers being new to the concept of urban farming, it is important to explore the challenges and barriers associated with urban food production, in order to take necessary actions to facilitate food production in urban areas.

Purpose & Objectives

The purpose of this study was to explore how the barriers faced by urban food producers influence their attitude towards urban farming. The specific objective that guided the study was to describe urban food producers perceived barriers associated with urban food production.

Methods

This study followed a basic qualitative design. Constructionism is the theoretical perspective used for this study. According to social constructionism, knowledge and truth are socially created through social processes and interaction (Young & Collin, 2004). This study was designed to understand the perspectives and perceptions of urban producers regarding barriers they face in producing food in urban areas. Since people are social beings, they engage with others to make meanings (Crotty, 1998). All interactions related to this study, including barriers to food production and suggestions for improvement, are influenced by social interactions.

Population & Sampling

The target population was commercial urban food producers in Columbus, Ohio, U.S.A. Columbus was purposively selected because it is a national leader in urban extension through their extension service, Ohio State University Extension (National Urban Extension Leaders, n.d.). The operational definition used for commercial urban producers in this study was, those who do animal husbandry, and/or grow plants in the city, process the harvest from plants and/or animals, and sell them in and around cities.

According to communications with a key informant, there were fifteen active urban food producers in Columbus. Purposive sampling, which is often used in qualitative research (Barbour, 2007), was used to identify those producers. Since there could have been other commercial producers in Columbus, snowball sampling was used to identify additional producers. According to Patton (2002), snowball sampling is a purposive technique that uses potential participants to identify other participants. Sample size was determined by the extent of

data saturation (Merriam, 1998). The initial commercial urban producers identified through purposive sampling were asked to nominate additional participants. Based on this process fifteen commercial urban food producers were identified and interviewed for the study. Since the sample size is small and sampling was not random, generalization cannot be done beyond the population (Ary et al., 2014).

Ten of the fifteen producers interviewed for this study were female and the other five were male. The respondents had an average of 15 years' experience in living in urban areas. The respondents' average farming experience in an urban area was 6 years. About 54% of the respondents had a 4-year college degree. About 15% of the respondents had completed college education and about 16% had a graduate or a professional degree. The other 15% of the respondents had completed high school or GED. Respondents' gross annual income from urban farming was below \$10,000 for about 70% of the respondents. Fifteen percent of the respondents stated their income was between \$10,000 to \$19,000. The income category between \$20,000-\$39,000 and \$40,000 - \$59,000 was 8% each.

Instrumentation

Individual interviews and participant observations were conducted to collect data. No similar interview guide was found on the given topic therefore, the researcher developed an interview guide using the study's conceptual framework. The content of the instrument included open ended questions about barriers and challenges faced by urban commercial food producers. The interview guide was developed through a process which included several steps such as literature review, feedback from a panel of experts, and approval from the institutional review board of the University

of Florida. Demographic data including gender, age, level of education, number of years lived in an urban area, type of produce, and type of market were also collected.

To measure the validity of a qualitative study and to establish rigor, Lincoln and Guba (1985) introduced the term trustworthiness. Trustworthiness could be measured in four ways: credibility, dependability, confirmability, and transferability. Credibility was established through member checking and triangulation. Thick description was used to establish transferability and confirmability was established through an audit trail. Ary et al. (2014) suggested using multiple data sources for triangulation. Therefore, researcher notes and audio transcriptions were used to confirm that different data collection methods supported the same finding. Member checking is a process that use participant's feedback on the collected data to ensure accuracy (Ary et al., 2014). Transcriptions of each interview were sent to the respective respondents to review for accuracy, and any needed changes were made to ensure that they captured respondents' true thoughts. Transferability was established through thick description. Thick description is "building a clear picture of the individuals and groups in the context of their culture and the setting in which they live" (Holloway, 1997, p. 154). Confirmability ensures that the findings of the researcher could be confirmed by another researcher if he/she conducted the same study (Ary, et al., 2014). Researcher notes and audio records were maintained throughout the data collection process to maintain confirmability. Moreover, audio records of each interview were listened multiple times for understanding. Transcriptions of the interviews were compared with the audio to ensure accuracy.

Data Collection & Data Analysis

Semi-structured interviews were conducted with each respondent. Semi-structured interviews allowed the researcher to collect more relevant information that was not included in the interview guide (Creswell, 2013). Each interview lasted an average of 20 – 30 minutes. First, informed consent was obtained from participants to take part in the interviews and audio recording of the interviews were done with the permission of respondents. The purpose of the study was explained to the participants and casual conversations were had to build rapport (Creswell, 2013). Questions related to the study were then asked using the interview guide.

The researcher visited each respondent's farm individually to conduct the interviews and to observe participants. During those visits, urban producers were shadowed to learn about their farm activities and operations. Participant observations allowed the researcher to explore and learn about urban food production in the natural settings of urban producers.

The conceptual model developed for the study was used as a guide to analyze data. First the collected data were transcribed by the researcher. The transcriptions were read several times to be more familiar with the data (Ary et al., 2014). Then line-by-line open coding was done as suggested by Strauss and Corbin (1990) to identify themes.

Subjectivity & Bias

The researcher is an important element of a qualitative research study (Merriam, 1998). Participants' viewpoints can be influenced by the personal preferences, interpretations, and experiences of the researcher. The researcher's belief that strengthening local food systems and urban extension programs are likely solutions to problems in urban areas could be a potential bias for this study. Moreover,

the participants for the study were identified through the extension specialist at Ohio State University. Therefore, the opinions of respondents concerning Ohio State University extension could also be a potential source of bias.

Results & Discussion

Several barriers to urban food production were identified during this study. Those barriers were categorized under the following themes: (a) barriers associated with legal factors, (b) barriers associated with cultural factors, (c) barriers associated with market factors, and (d) barriers associated with resources.

Barriers Associated with Legal Factors

Legal factors were considered as the most important barrier for urban food production in Columbus, and nearly all respondents considered this their number one barrier for urban farming. Legal factors included different rules and regulations imposed by city zoning and Home Owners Associations (HOA) which has made it difficult to practice agriculture in the city. The respondents stated Columbus city ordinances have restricted practicing commercial agriculture in lands smaller than five acres, selling agricultural produce on residential lots, and keeping chicken and other livestock on a residential lot. Most of the respondents interviewed for the study were small-scale and had less than five acres. Respondents indicated it is unaffordable for most of them to upscale their farm up to five acres because of the price of land in the city of Columbus.

Because of the fear for zoning restrictions, many respondents are reluctant to invest in their business, knowing that they could lose it at any point (R1, R2, R3, R4, R5, R8, R9, R12, R14, R15). R5 mentioned that she felt like she was doing a "drug deal" because she is always nervous about zoning

officers coming to their property. Farming is a very location-based activity. As stated by R12, “it is an activity that requires a lot of ingenuity and creativity. It’s really difficult to adhere to rules that won’t let you solve problems on your farm.” R14, who has three-acres of land, which is “huge in terms of the city,” complained about being considered illegal, because lands less than five acres is prohibited from agricultural activity by city ordinances. Much like R14, most of the urban farms that were interviewed for this study were considered too small according to city ordinances. R2 mentioned that she was nervous about her neighbors coming to her property to buy her plants because selling produce is not permitted on a residential lot.

Zoning is the biggest barrier, there is no doubt about that. I also have to deal with the zoning of the city which says I can’t sell that from my property. It is a huge hurdle and I feel like I have to be underground like it is a drug deal. I am nervous because last year my neighbors wanted to buy my plants that I started in my basement. And I was nervous about them coming to my property. Even though it is not actual selling food, it is selling something out of my property. So, I feel uneasy about that. (R2)

Other than being illegal to practice agriculture in a residential zone, the respondents also complained about the cost they had to pay and the trouble they had to undergo to get legal permission to practice agriculture which is overbearing, expensive, and time consuming (R5, R8, R4). R4 stated that he felt like “the city is trying to price us out for doing agriculture.”

We cannot keep chickens because of the neighbor complains and the cost to make it worth it with the system that Columbus city has set up, which makes it doable. But it is so expensive, so it’s not worth it. (R8)

Ineffective communication of legal requirements to urban producers was another barrier. Several respondents have had numerous bad experiences with city zoning, because of their unawareness about city codes. R5 said that she had to complete a storm water management plan for having high tunnels, because the city dictated it. Moreover, R12 stated that the city zoning officials are very unfamiliar with the urban food production concept, hence do not know the “proper” way to practice it. He went on to say, “you ask like three different people within the city’s zoning office and they give you three different answers.” This has become a huge challenge for the respondents to figure out the appropriate and legal way to do things.

Adhering to HOA guidelines is another challenge. HOA bylaws have made it difficult for some producers to practice urban agriculture. Several respondents mentioned they are afraid to put a sign up because the HOA could see it and will come to inspect them. As expressed by R3, “how can we hide what we do” has been the main concern of most urban producers.

Barriers Associated with Cultural Factors

Barriers associated with urban culture were identified as another challenge for urban food production. Cultural factors included lack of acceptance for urban producers in society, perception about urban farming, and food habits of urban consumers.

“Acceptance” is the greatest cultural barrier as perceived by the respondents. Most of the producers emphasized they did not feel accepted in their community (R1, R3, R5, R8, R10, R12, R13). A negative perception towards urban farmers has made them mentally and physically uncomfortable presenting themselves to their communities. Several respondents expressed that people have set ideas of living in an urban neighborhood, and any deviance from that norm is not appreciated. According to R3’s experiences, engaging in agriculture is not considered normal in an urban area whereas that is “life in rural areas.” R7 stated, “I want to tell people I’m a farmer and they say, ‘how many acres do you have’ and I say, ‘three tenths’ and they laugh. They don’t – they can’t figure that out. So, I think there’s a lot of reluctance to accept that it’s possible even.”

I see gardening as a radical act. Farming, food producing is a radical act in our culture. This culture doesn’t definitely accept it. When you are in a rural area, that way of thinking is life. But it is not something that you see as normal in an urban area. (R3)

R5 reflected that she did not grow food in her front yard because it is “seen as negative, because the front yards are to grow flowers only.” Keeping animals has become a hurdle for the respondents because of the negative perception. According to R3, people in urban areas do not have a problem with cats and dogs that roam every day, even though it is illegal. But, “if you get a chicken and put it in a pen in your backyard and the city will be showing up. But their dogs can bark forever and that’s not seen as unusual” (R7).

Urban consumers’ food habits is another barrier identified by the respondents.

Growing and cooking their own food is not a part of urban culture. According to R7, most people living in urban areas are used to outsourcing everything to save time and energy. As explained by R3, “People go to places to eat and they eat the same thing every time. They don’t want to eat seasonally.” This has created a challenge for urban food producers to sell fresh produce.

Most people in our culture particularly in urban culture have had everything outsourced. You know, they have somebody to clean their home, they have somebody to grow their food, they have somebody to babysit their children whatever. So, people have become used to where everything is done by corporations for them. They shop at Walmart and see that as a way of life. (R7)

Personal relationships the respondents have with their neighbors have also been a challenge for some respondents. Respondents who had positive and friendly neighbors did not have any issue with farming. Respondents whose neighbors dislike farming or have negative perceptions towards farming had several bad experiences. R3 mentioned that her legal permission to keep chickens was blocked by one of her neighbors because they did not like having chickens in the neighborhood.

Theft is another problem faced by the respondents. Several respondents (R5, R3, R11, R14) complained that their produce is being stolen by others. Even though theft is a critical issue for many community gardeners, several commercial producers have experienced this too.

Barriers Associated with Market Factors

Competition is the main barrier associated with market factors. Non-profit farms are the main competitor for urban commercial producers. Both non-profit producers and for-profit producers sell their produce through farmers' markets, restaurants, CSA (Community Supported Agriculture). According to respondents, while practicing agriculture is perceived negatively in urban culture, non-profit urban farms are viewed more positively among consumers because of their social mission. In addition to consumers, the respondents think that funds, labors, and other resources are more skewed towards non-profit because "the story about the non-profit side is shared and it seems it's like a really successful type of business" (R1).

I am not saying they should not exist. But, it's a challenge and it feels like because there's a social mission attached to it, it is seen in a better way. It is just I don't think it is completely fair because for-profit farms do a lot of social and community building too. (R14)

Moreover, because non-profit urban producers have more opportunities for funds, for-profit producers think that there is a conflict of interest, because they have to "pay for all their stuff themselves while non-profit producers are getting money from grants" (R8). R7 went on to say that many urban producers have problems with non-profit urban farms because "they drive prices down, which is unfair."

But there's some tension between for-profit farms and non-profit farms when they're both in the same market; the farmers' market. Because the

non-profit farms think that they need to supplement the money they get which is understandable. But the for-profit farms feel like it's crowding the market for they don't get supplemental grant money. I think it could be good if there's a mission to subsidize farm grants to get food. (R14)

Limited market options is another barrier for the respondents. Farmers markets are a venue for rural producers, urban producers, for-profit producers, and non-profit producers. The respondents prefer to sell at farmers' markets because they get to meet with their customers. However, they have to compete with rural producers who sell at a lower price, and with nonprofit producers who have a social mission. The competition to get into the farmers' market and be a vendor there is also a challenge for the respondents because there are a limited number of farmers' markets in the city. R6 expressed the difficulties they face in the "oversaturating farmers' market," highlighting the need for sales outlets for small scale commercial producers.

Since we don't have great outlets for sale for small tiny producers there's more like over saturating and already flooded farmers' markets here. In order to accommodate more producers more farmers' markets are produced and the same customer base that is torn apart by different markets and different producer. (R1)

Barriers Associated with Resources

In addition to legal, cultural, and market-related factors, there are barriers to urban food production associated with

resources. Insufficient land, quality of soil, and water scarcity were some of those barriers mentioned by the respondents. Inadequate land for agriculture has become a challenge to meeting the demand of consumers. But depending on the price and fertility of the land in urban areas, acquiring more land has become difficult. R11 expressed that he does not have “enough space to work full time hours, even though farming is his only job.”

For me personally, meeting the demands is more of a problem than not meeting the demands. I don't have a surplus of food. It's a struggle always to produce as much –for me personally, to produce as much as I can because there's a million places for me to get rid of it. So, one of the struggles is limited space and you're always trying to get more space. (R7)

In addition to the quantity of land, quality of land is a challenge. Most producers interviewed for this study identified poor soil quality as a barrier to continuing production. Respondents indicated they are unable to do in-ground production because of poor soil fertility. Therefore, they would have to import soil and do above-ground production. Availability of water is another problem. Several respondents complained about the difficulties they had to undergo to have a continuous water supply to keep their plants alive because of the cost to install water lines and having to pay for water at retail rates.

Most respondents criticized the fact that there are not enough resources for full-profit urban agriculture. As explained under market factors, the respondents complained that most funding opportunities and grants

are skewed towards nonprofit urban farms because of their social missions. Some respondents believed that extension and other organizations also prefer to disseminate information more towards nonprofit because of the same reason.

But since there aren't resources towards the full profit side, not just money even time or information, and there's this group of people who are trained to be urban farmers. And here in Columbus, there's not support once you are a full profit urban farmer. (R1)

Conclusions, Implications & Recommendations

According to the DTPB, complexity has a direct relationship with attitude (Taylor & Todd, 1995) and increased perceptions of complexity leads to more negative attitudes towards a behavior (Rogers, 1983). Therefore, barriers to urban food production need to be addressed wisely if urban agriculture is to play a role in achieving urban food security and sustainable development in cities globally.

Ensuring food security in urban areas is one of the key components of sustainability in cities (Pothukuchi & Kaufman, 2000). According to the findings of this study, urban food producers considered for this study do not really address the food security issues in Columbus, because of the small number of farms, amount of produce they sell, limited land areas they have, and the comparatively high price of their produce. However, these producers play an important role in the city's food system because they meet the food requirements of consumers who prefer fresh, locally produced food delivered to their door or purchased at the farmers' market.

Agriculture is a location-based activity that is influenced by state and local regulations. From city to city across the globe, agricultural and extension education professionals will need to understand zoning ordinances to determine if agriculture is permitted and where agriculture can be practiced. According to this legal code of Columbus practicing agriculture is not permitted on residential lots that are less than five acres. Most of the producers interviewed for this study have less than five acres of land, and many respondents considered their business illegal in terms of city ordinances. Creating friendly zoning processes are vital to foster urban agriculture (Mukherji & Morales, 2010), and therefore, attention needs to be given to revising city ordinances which would help people to adopt urban farming.

Universities, extension professionals and other responsible authorities can educate local officials and recommend the need for action for a policy change to promote farming in the city. Moreover, producers should also take into consideration the area in which they are trying to farm. Therefore, producers who do not want to be bound by those rules might consider looking for better farming opportunities elsewhere when there is an option.

Even though the respondents are hesitant to make their farms visible by adding signage due to fear of zone ordinances and HOA, it was interesting to notice that most of them are actively marketing their farms on Facebook and other social media. Several producers interviewed for this study also had websites created for their farms as well.

Ineffective communication and unawareness about city codes are also barriers to urban food production. Metropolitan cities can fall under the governance of numerous county, regional, and other private agencies (Gaolach, Kern,

& Sanders, 2017). Therefore, producers must contact several agencies and departments to get information relevant to land use for agriculture as rules vary between agencies and jurisdictions. Agricultural and extension education professionals can work with cities to come up with an entity that has all the information and resources relevant to urban land use planning that would help both the city and the producers in terms of information. Moreover, agricultural and extension education professionals can work with cities to design programs to educate urban food producers about the legal aspects of urban farming which would be helpful for both parties in terms of time and cost.

Around the world, urban areas are highly diverse socially, culturally, economically, and environmentally compared to rural areas. To address complex issues in urban areas, extension professionals need a sound understanding about the complex urban environment (Gaolach et al., 2017). Unlike rural areas, agriculture is not considered a part of urban life. Urban residents may negatively perceive agriculture in other locations. People may dislike agriculture because they are unfamiliar with it or concerned about potential negative outcomes that affect them such as water contamination, health effects, and impact on land values (Kim et al., 2014). Negative perception towards urban farming could be overcome by making urban residents aware of the importance of agriculture in the city through social marketing campaigns, social media, and other marketing strategies.

Extension systems can partner with others to design awareness campaigns to make residents aware of the importance and value of urban agriculture. Extension clientele who have negative relationships with their neighbors may have more challenges compared to those who have

friendly relationships with their neighbors. Therefore, it is recommended that urban producers try to build good relationships with their neighbors by talking with them and making them aware of the environmentally friendly practices they follow. Extension, social organizations such as religious institutions, and key personnel in urban areas can provide support to foster these key relationships. The respondents could also share their excess produce with neighbors too. Community mediation programs developed specific to urban agricultural issues could also facilitate communication and problem solving among neighbors and food producers.

Overcoming barriers related to negative perception towards urban food producers can be done through workshops and events. Information needs to be shared among urban residents about the value of supporting local producers. Agricultural and extension education professionals should consider ways to create more market options for urban food producers. The extension system can help the city to identify barriers to entering into new markets.

To help producers overcome limitations for resources such as land, agricultural and extension education professionals can work with city officials to develop a strategies to help urban producers purchase and lease land. Small grants and low-interest loans could be offered to urban producers to motivate them more towards agriculture production. Developing partnerships with other institutions with similar missions of serving the urban community is mutually helpful for extension and other parties and a way to develop social capital in urban areas (Lubell & Fulton, 2008). Therefore, programs, networks, organizations, and responsible people directed towards urban farming would help to eliminate barriers to urban food production.

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