PERSPECTIVES OF FOOD PRODUCERS REGARDING FOOD PRODUCTION IN URBAN AREAS: IMPLICATIONS FOR URBAN EXTENSION PROGRAMS IN COLUMBUS, OHIO

By

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To Thaththa, Amma, Ayya, & Malli
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LIST OF ABBREVIATIONS

CES       Cooperative Extension Service
CSA       Community Supported Agriculture
DTPB      Decomposed Theory of Planned Behavior
FAO       Food and Agriculture Organization of the United Nations
HOA       Home owners Association
IRB       Institutional Review Board
MORPC     Mid-Ohio Regional Planning Commission
OSU       Ohio State University
TPB       Theory of Planned Behavior
TRA       Theory of Reasoned Action
US        United States
USDA      United States Department of Agriculture
WSU       Washington State University
PERSPECTIVES OF FOOD PRODUCERS REGARDING FOOD PRODUCTION IN URBAN AREAS: IMPLICATIONS FOR URBAN EXTENSION PROGRAMS IN COLUMBUS, OHIO

By

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Chair: Grady Roberts
Co-chair: Laura Warner
Major: Agricultural Education and Communication

The majority of the world population is represented by urban dwellers (Clark, 1998; Donald & Blay-Palmer, 2006). With the increasing population, the demand for food increases, adding extra pressure to the existing food systems. Therefore, if not addressed properly, urbanization may lead to issues such as food insecurity and poverty in urban communities.

The purpose of this study was to explore perspectives of urban food producers regarding their experiences in producing food in urban areas. The specific objectives were to identify information needs and information-seeking behavior of food producers, perceived barriers to urban food production, and intention of food producers to farm in urban areas. Three different studies were designed to meet the purpose of this study.

A mixed-method research design explored the information needs and information-seeking behavior of urban food producers. Urban food producers in Columbus, Ohio use different information sources to gain information. They prefer online sources over other sources and trust people from their close social network to receive information. The presence of Extension is not strong in this area, even though producers preferred to receive information from Extension.
A qualitative design guided the study on identifying barriers to urban food production. Semi-structured interviews were conducted 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.

A qualitative design was used to explore the intention of food producers to farm in urban settings. According to the findings, attitude is a strong predictor of behavioral intention. Complexity is a great determinant of attitude. Not having legal and institutional support hinders food producers’ motivation towards urban food production.
CHAPTER 1
INTRODUCTION AND BACKGROUND

Chapter Overview

The purpose of this study was to identify urban food producers’ perspectives of farming in urban areas, in order to inform the development of urban Extension programs. Urban and rural areas have innate differences. Therefore, having an understanding of intention to continue farming, the needs of urban producers, and the challenges and barriers faced by urban producers is very important for the Cooperative Extension Service (CES) to develop successful urban Extension programs.

This chapter starts with an introduction to urbanization, highlighting the consequences of population growth. Those consequences include complex issues such as climate change, food insecurity, poverty, malnutrition, and unemployment. Introduction of this chapter is followed by a discussion on food production in urban areas as a solution for sustainability and urban food insecurity. An introduction to Extension program planning and urban food production is provided in the final sections.

Urbanization

Urbanization is occurring at an unprecedented rate and the majority of the world population is now represented by urban dwellers (Clark, 1998; Donald & Blay-Palmer, 2006; Pickett, Cadenasso, Grove, Nilon, Pouyat, Zipperer, & Costanza, 2001). The projected increase of the world population from 2008 to 2050 is 6.7 billion to 9.2 billion (United Nations, 2008). This is an increase of 65% of the population from today. According to the United Nations (2008), this population growth will mainly occur in urban areas and the rural population is expected to decline by 150 million by 2050. About 61% of the urban population lives in small and medium-sized cities, which often lack basic facilities and infrastructure to meet the needs of
the increasing number of people (Montgomery, 2008). This situation is not limited to the developing world; the United States is also becoming an urban country. With the increasing population, there is a rapid growth in the number of people living in urban areas. According to the U.S. Census, the number of people living in urbanized areas of 50,000 people or more has grown from 68.3% to 71.2% of the total population from 2000 to 2010 and is projected to grow more (Urban Area Criteria for the 2010 Census, 2011, U.S. Census Bureau, 2010).

With this increasing population, cities face challenges in providing resources and fulfilling basic the needs of urban dwellers. Food, drinking water, sanitation, waste management, healthcare, education, and employment are some of the basic needs of people that are facing increasing demands as people migrate into cities (van Veenhuizen & Danso, 2007). Since most of the cities have limited resources and the infrastructure to meet these requirements inequality, poverty, malnutrition, food insecurity, and environment degradation have become critical issues in urban areas with the continued urbanization (Ramankutty, Foley, & Olejniczak, 2002; van Veenhuizen & Danso, 2007).

Urbanization is inevitable with the increasing population, industrialization, and the development of other socio-economic factors. However, many countries in the world have been unable to face the challenges of urbanization because the rate of urbanization is outpacing the growth of resources and the infrastructure of cities. According to the literature, food production in urban areas has become a mean of food supply for urban residents (CRD Roundtable on Environment, 2006; Mendes, 2006; Mullinix, Fallick, & Henderson, 2009). Food security occurs “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” (Food and Agriculture Organization of the United Nations, 1996, p. 3). Most urban food production
initiatives implemented in the world have occurred as a solution to the issues related to survival and subsistence. According to the World Bank (2008), the world is in need of 70% to 100% more food by 2050 in order to feed 9.2 billion people.

With the increasing population, the demand for food increases which adds extra pressure to the existing food systems (van Braun, 2007). 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. However, with the increasing population and urbanization most of the productive agricultural lands have been lost due to the development of houses and other buildings (van Braun, 2007). Therefore, if not addressed properly, urbanization may lead to severe threats in urban communities such as food insecurity and poverty.

**Food Systems**

“The combined elements of food production, processing, distribution, preparation, and consumption” is called a food system (Gregory, Ingram, & Brklacich, 2005, p. 3). Food systems vary from simple to complex. An example of simple food systems is subsistence farming, while mono-crop cultivation for exportation can be considered an example of a complex food system (Gregory et al., 2005).

With time, agriculture has diversified into mechanized, industrialized, and large-scale practices with extensive use of irrigation, chemicals, and fertilizer (Beus & Dunlop, 1990). Today, food systems have become more complex and challenging. Growing food requires steps in a supply chain 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 network of transportation 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 agriculture systems, which create problems for the sustainability of the urban eco systems (Horrigan, Lawrence, & Walker, 2002). Therefore, the need for a locally-grown new food system has been highlighted especially in urban areas, which can supply fresh and nutritious produce to consumers and processors (Blay-Palmer, 2008; Kloppenburg, Hendrickson, & Stevenson, 1996).

**Urban Food Production**

Agriculture occurring in urban areas can be called urban food production and comprises one component of local food systems. The Urban Agriculture Committee of the Community Food Security Coalition (2002) defined urban food production as “the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities” (p. 4). Even though it is manifested as vegetable and fruit production in many cases, it varies widely (Viljoen, 2005). Since urban areas provide better opportunities for agricultural activities such as marketing produce, demand for food, and accessibility to resources, food production in urban areas has been identified as an important component of urban sustainability (Alberti, Marzluff, Shulenberger, & Bradley, 2003; van Veenhuizen & Danso, 2007).

In 1996, metropolitan counties contributed to 30% of the agricultural produce in the country (Smit, Ratta, & Nasr, 1996). As reported by Heimlich and Anderson (2001), “in 1997, urban agriculture made up a third of all farms and contributed 39 percent of farm assets. Eighteen percent of farmland operated was located in metro areas in 1997” (p. 38).

The demand and recognition for urban food production are increasing globally as a sustainable development strategy in cities (van Veenhuizen, 2006). Because of the health, economic, environmental, and other benefits attached to it, urban food systems have been
recognized as an important element of urban sustainability by urban residents, governments, and other stakeholders in the city (CRD Roundtable on the Environment, 2006; Mendes, 2006; Mullinix et al., 2009; Pothukuchi & Kaufman, 1999). With the recognition of the importance of urban food systems in the country, an increase in the number of farmers’ markets, community gardens, and urban farms has also been reported (Low, Adalja, Beaulieu, Key, Martinez, Melton, & Jablonski, 2015; National Gardening Association, 2014; Rogus & Dimitri, 2015). When food is produced within the city the cost of transportation, processing, and packaging also decreases (Mendes, 2006; Mougeot, 2006). Building community and social capital, self-sufficiency, and creating local resilience are other advantages of urban food production (Brown & Jameton, 2000; van Veenhuizen, 2006).

Some prominent characteristics of urban food production are space limitation, proximity to markets, the minimum degree of farmer organizations, high specialization, limited space, and high competition for land (van Veenhuizen, 2006). Not only nationally, but also internationally efforts have been taken to improve food production in urban areas (van Veenhuizen, 2006). Greening urban cities, utilizing organic waste, reducing pollution, minimizing heat, and improving air quality are some of the advantages of urban food production. It also helps to contribute building community and social capital, which in turn creates self-sufficiency and social resilience (Brown & Jameton, 2000). For these reasons, the attention for urban vegetation and urban gardening has increased as they contribute to improving the quality of urban life by offering opportunities for income generation, mental relaxation, social integration, and physical exercise (Lee & Maheshwaran, 2011).

As explained by the Urban Agricultural Committee of the Community Food Security Coalition (2002), “urban farmers are practical, high-energy individuals willing to take advantage
of the significantly higher margin the urban farmer can sell to retail, over against the rural farmer” (p. 3). Urban producers can be broadly categorized into three main areas according to their location and practices: backyard gardeners, community gardeners, and commercial growers (Urban Agricultural Committee of the Community Food Security Coalition, 2002). Just like the urban population itself, urban producers are also very diverse. Women farmers, immigrants, and minority populations play a significant role in urban agriculture in the U.S. (Urban Agricultural Committee of the Community Food Security Coalition, 2002). The next sub-sections of this chapter briefly discuss the scope of urban backyard gardeners, community gardeners, and commercial urban producers.

**Urban backyard gardeners**

Even though the term backyard gardeners refers to those who grow fruits, vegetables, edible herbs, and flowers in plots, this term is also used to describe people, who garden on their decks, rooftops, and balconies. About one-quarter of urban dwellers in the United States have backyard gardens (Urban Agricultural Committee of the Community Food Security Coalition, 2002). Most of these backyard gardeners do it as a hobby to grow their own food as a supplement. Surplus food is either preserved or given to neighbors and friends. Even though the goal of urban backyard gardening is not subsistence, it helps most of the urban dwellers to stretch their food budgets (Urban Agricultural Committee of the Community Food Security Coalition, 2002).

**Urban community gardeners**

Community gardeners grow their own food on the lots that have been provided for each household’s use. These lots are owned by institutions, community groups, a municipality, a land trust, or some other entity (Urban Agricultural Committee of the Community Food Security Coalition, 2002). Normally the food grown in community gardens are kept for consumption by
family and friends. Sometimes, community gardeners get together and share the garden plots to grow food as a source of income (Urban Agricultural Committee of the Community Food Security Coalition, 2002). Although community gardening started as a solution to the economic depression of medium and poor income families in urban areas, now the purpose of community gardening has extended beyond food production (Hynes & Howe, 2004). For instance, community gardening is well accepted for its social, health, economic, and educational benefits (Ferris, Norman, & Sempik, 2001; Patel, 1991; Wakefield, Yeudall, Taron, Reynolds, & Skinner, 2007). Even though, the main goal of community gardening is to produce food, community gardeners also contribute to improving their neighborhoods, doing social activities in their communities, and engaging youth in agriculture (Urban Agricultural Committee of the Community Food Security Coalition, 2002). Today, community gardens are found in all 50 states of the country from metropolitan cities to rural areas (Lawson & Drake, 2013). The percentage of community gardeners as a proportion of urban producers in the United States is very low (Urban Agricultural Committee of the Community Food Security Coalition, 2002).

**Urban commercial growers**

Commercial producers can be defined according to the two main tasks they perform: production and commerce (Louton, 2016). Production includes producing food for sale. The growing plants, keeping animals, harvesting them, and preparing them for sale is included in the production process. Commerce includes “arranging sales, contact with customers, and getting the product to buyers” (Louton, 2016, p. 19). With the increasing urbanization, the trend for commercial farms has increased. Since many urban dwellers prefer to buy fresh, locally grown, nutritious produce that is grown close to their homes, there is a good urban market for urban produce (Urban Agricultural Committee of the Community Food Security Coalition, 2002). Since commercial urban growers have a great capacity to address food insecurity in urban areas,
they are the focus of this study. More details about commercial urban producers including their characteristics and the barriers they face are discussed in the next sections of this chapter.

**Challenges and Barriers to Urban Food Production**

Urban agriculture has numerous benefits for urban dwellers and for the urban environment. The challenges and barriers to urban agriculture vary from city to city. But the barriers discussed in this section are relatively common across the literature. This section of Chapter 1 summarizes some of the barriers to urban food production. More challenges and barriers faced by urban food producers are discussed in Chapter 4 of this document.

The barriers to urban food production include legal barriers, environmental barriers, social barriers, economic barriers, etc. Because of the barriers attached to it, urban food production is considered a risky venture (Kaufnam & Bailkey, 2000). Even though farming and agricultural operations have been very common to most rural and sub-urban parts of the country for decades, it is relatively a new business in urban areas. Therefore, city governments and policy councils of several cities in the country have made suggestions to expand urban agriculture (Goldstein, Bellis, Morse, Myers, & Ura, 2011).

Knowledge gaps and institutional barriers have been highlighted as priority needs of urban producers because of the regulations in urban areas that prevent farming in cities (Pearson, Pearson, & Pearson, 2010). Even though raising crops and animals are permitted in rural and peri-urban districts, agriculture is either restricted or permitted under different conditions in urban areas. Access to capital and credit, lack of infrastructure, land tenure, access to water, and environmental contamination are some of the other issues faced by urban producers (Hendrickson & Porth, 2012; Kaufman & Bailkey, 2000, Raes Harnes, Presley, Hettiarachchi, & Thine, 2013).
Surls et al. (2011) identified some barriers associated with the CES for urban food production. In some urban areas, Extension agents being physically located away from urban areas is a major barrier to disseminating information. Most of the existing Extension materials, curricula, and delivery modes in urban areas have been adapted from rural experiences; not developed for unique urban audiences. Therefore, relating these Extension materials in meaningful ways to urban perspectives has been a problem for urban Extension clientele because some of them do not adapt well to urban context (Krofta & Panshin, 1989; Webster & Ingram, 2007). Therefore, receiving adequate support from relevant parties has also become a problem for urban producers (Surls et al., 2014).

**Urbanization in Ohio**

Ohio is among the seven most populous states in the nation, with nearly 11.5 million residents (U.S. Census Bureau, 2010). By population, three metropolitan areas in Ohio namely Cincinnati, Cleveland, and Columbus are among the largest metros in the nation (Ohio History Central, 2016). According to literature, the main reasons for increasing population in these cities are immigration from Europe and migration from other cities (Ohio History Central, 2016). About 80% of the total population of the state lives in urban metropolitan areas.

Columbus, where this study was conducted, is the capital of Ohio. Columbus records the largest population in Ohio. Approximately, 17% of the total population of the state live in the Columbus metropolitan area. Not only the population but also the territory of Columbus has expanded its boundaries since 1950. The total population of Columbus is more than 800,000 people and the land area is more than two hundred square miles, which makes it the 15th largest city in the United States (U.S. Census Bureau, 2010; Ohio History Central, 2016).

The Columbus metropolitan area consists of ten counties and Columbus is the administrative center of Franklin County. In 1950, 87.5% of the Columbus population had been
White non-Hispanic and 12.4% Black or African American with no records of an Asian or a Latino population (U.S Census Bureau, 2005). By 2010, the demographic breakdown had changed to 61.5% White, 28% Black or African-American, 5.6% Hispanic or Latino, and 4.1% Asian (U.S Census Bureau, 2010). The median age of the city residents was 31 years and the median income of a family was $47,391. The economy of Columbus is also very diverse as the city is headquarters for five large cooperation (Weese, 2013). In 2006, Columbus reported the best economy in Ohio and the seventh strongest economy of the country (Weese, 2013). Because Columbus is the capital of the city, the presence of the government is huge in Columbus including government jobs, state, federal, and country jobs adding more to the diverse economy of the city.

**Urban Agriculture in Columbus**

As explained in the previous paragraph, Ohio is a very diverse state in all aspects. There is a huge gap between the actual production from land and the consumption of the people who live there (MORPC & the Columbus Foundation, 2010). USDA’s estimated expense for food for the ten counties of Columbus is about $7.5 billion per year (MORPC & the Columbus Foundation, 2010). Ohio residents spend an average of $43 billion per year on food. Out of the total production of the state, about 70% is corn and other grains that cannot be directly consumed by people (MORPC & the Columbus Foundation, 2010).

If more food could be produced locally through urban food production systems, the cost of importing and transporting food could be reduced, which would be a huge saving for the economy and the country overall. It is estimated that if Columbus can increase local food production and local food purchase within the ten counties of the city, the city can save $750 million per year (MORPC & the Columbus Foundation, 2010). Cattle production in Columbus
declined by 5.8% while there was 38% and 14.6% increase of pork and sheep production respectively from 2002 to 2007 (USDA Census of Agriculture, 2007).

Food insecurity is a complex issue closely connected with population growth. One in seven households in the U. S. was considered food insecure in 2014, and in Ohio, the ratio was one in six households (USDA, 2010). According to the estimation of USDA (2010), 23.69% of Columbus residents have poor access to grocery stores. High blood pressure, type 2 diabetes and other health issues were reported from 30% of Pre-K and 28% of kindergarten students in Columbus in the 2014-2015 school year (MORPC & the Columbus Foundation, 2010).

Urban agriculture is used as a means of promoting sustainable development of the city and increasing access to local food in Columbus, Ohio. Urban farming occurs at different levels in Columbus, such as backyard gardening, community gardening, and commercial agriculture. There were only five commercial farms in the city about three years ago. With the increasing urbanization and efforts from Ohio State University (OSU) Extension, there are now an estimated fifteen commercial farms in the city which are engaged in food production (M. Hogan, personal communication, January 7, 2017).

Columbus provides a lot of marketing options for its producers such as food banks, restaurants, and farmers markets. Land prices in Columbus are comparatively higher than that of other cities in the state, which poses challenges for urban producers to expand their businesses (M. Hogan, personal communication, January 7, 2017).

**OSU Extension’s Urban Initiative**

The OSU Extension has initiated different programs and learning opportunities through its country extension offices to promote urban agriculture in the city (OSU Extension, n.d). The Master Urban Farmer program is one such educational program which offers a series of workshops to interested individuals about producing and marketing in the city. It provides the
opportunity to passionate individuals to work with county Extension personnel to learn, network, and share information with other interested parties about urban agriculture (OSU Extension, n.d.). In 2016, about 41 individuals have graduated from this 10-week educational program which adds up to the 196 Master Urban Farmers who have successfully completed this program since its inception (OSU Extension, 2016).

Ask an Expert is another OSU Extension initiative which is an online system that offers the opportunity to ask questions online and receive expert answers. Individuals can submit their questions through that online system to be answered by OSU Extension faculty (OSU Extension, n.d). Other than the above-mentioned programs OSU Extension also organizes workshops, training programs, conferences, and farm tours to interested individuals to provide educational services to its urban communities (OSU Extension, n.d).

Local Food Action Plan, Columbus, Ohio

Having identified the need for a strong local food system, the Columbus and Franklin County Food Action Plan was launched in 2016 in order to “inform public policy, inspire program development, foster community collaborations, guide local funding strategies, and establish the foundation for successful philanthropic and public grant applications” (Local Food Action Plan Project Team, 2016, p. 6). This is a community effort that includes a framework of actions for many partners in the food production system to overcome food related issues. This plan is informed by more than 1000 people and stakeholders of the city and is aimed to overcome critical food related issues such as poverty, inequality, and unemployment. The four main goals identified in the Local Food Action Plan are to;

- enhance coordination and communication among existing food resources and agencies,
- improve access to and education about healthy, affordable local food,
- increase the role of food in economic development, and
- prevent food-related waste” (p. 13)
For the successful implementation of the program, the need of collaborative efforts among different stakeholders, agencies, and people is highlighted because “coordination and communication issues exist and residents do not know what resources are available” (Local Food Action Plan Project Team, 2016, p. 19). The OSU Extension can play an important role in meeting each of these goals identified in the local food action plan. Some of the recommendations of the Local Food Action Plan such as supporting more people to grow food for themselves, creating educational resources about accessing healthy food, and identifying strategies that can bring healthy food to residents (Local Food Action Plan Project Team, 2016) are directly related to OSU Extension’s mission of “creating opportunities for people to explore how science-based knowledge can improve social, economic, and environmental conditions” (OSU Extension, n.d)

Urban Extension Programs

When the CES was established by the Smith-Lever Act of 1914, about 50% of the country’s population were rural and out of them 30% of the workforce had engaged in agriculture and farming-related livelihoods (Kerrigan, 2005). With urbanization, rural-urban shift, changes in the global economy, advancements in science and technology, and several other changes in social and environmental factors, society has become different and more complex (Extension Committee on Organization and Policy, 1995). Youth development, financial challenges, health issues, food security, environment quality degradation, water conservation, poverty, unemployment, illiteracy, and landscaping have been some of the complex problems identified in urban and suburban areas (Reaves, 1999). According to the Extension Committee on Organization and Policy (2002), with the increased diversity and complexity in urban areas, these issues have been critical. These unique challenges and complex issues in urban areas
prevents the adaptation of existing Extension programs, highlighting the need for urban specific programs.

Extension has a long history of working with local communities. Since the focus of a land grant university is to serve statewide, it is important to have more and better focus, and presence in big cities while maintaining a focus on rural areas. Therefore, addressing urban issues has to be a significant focus for the CES to have a viable future (Usinger-Lesquereux, 1995). Since Extension’s responsibility has been to serve all people of the country (Panshin, 1992), “there is no choice but to cultivate an urban presence” (Kerrigan, 2005, p. 26).

Although Extension is not the only solution for all the complex issues in urban areas, it can play a major role in “building socially, economically, and ecologically sustainable, healthy, and food secure cities” (Daftary-Steel, Herrera, & Potter, 2015, p. 27). Attention has been given to facilitating agriculture within city boundaries to increase food access to urban residents (Low et al., 2015). According to Daftary-Steel et al. (2015) addressing issues in local food systems is a successful strategy for Extension to address complex issues in urban areas. Different state and local Extension programs have taken initiatives to engage urban residents in urban agriculture projects (Fox et al., 2015). Because Extension has a historical relationship with local communities, several researchers have suggested that Extension use its research expertise and programs to act as service providers for local food systems (Clark et al., 2016; Colasanti, Wright, & Reau, 2009).

Planning of Extension Programs

Extension program planning is defined as “the process by which members of an organization or community envision its future and develop the process and operations necessary to achieve that future” (Suvedi & Kaplowitz, 2016, p. 34). The Extension program planning process is a cyclical process which includes continuous situation review, consultation of
stakeholders, and mobilization of resources (Suvedi & Kaplowitz, 2016). No universal approach or format has been established for planning Extension programs. Boyle (1981) described three types of Extension programs namely developmental programs, institutional programs, and informational programs.

Careful planning is identified as one of the main requirements for effective Extension programs. “Lack of adequate planning and continual evaluation is a major reason for the frequent failure of development projects and Extension activities” (Koehnen, Portela, & Cristovao, 1993, p. 207). Who is planning the program, for whom the program is planned, goals of the program, means of the program, the time frame of the program, socio-political environment, physical scope of the program, and funding are some of the important variables to be considered when planning Extension programs (Dusseldrop & Ziderveld, 1991).

Elements of a good Extension program plan as reported by Suvedi and Kaplowitz (2016) include:

- clear and measurable objectives,
- focus on the needs of target audience,
- several activities that are relevant to achieve the program objectives,
- an outline of resources and other inputs required for the program,
- a clear plan about how, when, where and to whom the program is being implemented, and
- an evaluation plan.

Urban Extension Program Planning

Both rural and urban areas have common social issues. But because of the diversity, complex environments, multiple jurisdictions, and other infrastructure issues, adapting existing Extension programs are not successful in urban areas (Gaolach, Kern, & Sanders, 2017). The effectiveness of an Extension program depends on the positive change it creates among target audiences (Kalambokidis, 2014). According to Gaolach, Kern, and Sanders (2017), Extension
programs, techniques, and delivery methods need to consider the diversity and commonalities between rural and urban areas in order to plan effective Extension programs. Positioning, programming, partnerships, and personnel were identified as the most common areas that pose challenges and barriers to urban Extension (National Urban Extension Leaders, 2015). Most of the existing Extension materials, curricula, and delivery modes in urban areas have been adapted from rural experiences, and not developed for unique urban audiences. Therefore, relating these Extension materials in meaningful ways to urban perspectives have been a problem for urban Extension clientele because some of the materials do not adapt well to urban context (Krofta & Panshin, 1989; Webster & Ingram, 2007).

The demand for university-based engagement in urban areas in policy and decision making has always been significant because, with the absence of public sector involvement urban clients have to rely on private organizations at higher costs and increased unreliability (National Framework for Urban Extension, 2015). Because of the unique nature of urban settings discussed in previous sections of this chapter, some additional competencies and attributes have been identified as needed by Extension agents who work in urban areas (Fehlis, 1992; Webster & Ingram, 2007). Capacity building and time management are two such suggested competencies for Extension agents who work in urban areas (National Framework for Urban Extension, 2015). This has created a need for Extension agents in urban areas to be competent in managing grants, contracts, the use of social media and other multiple skills (National Urban Extension Leaders, 2015, p. 9). A focus on identifying these gaps and needs in urban Extension programming should be a concern for future urban Extension.

**Statement of the Problem**

The U.S. has become increasingly urban. The increasing demand for food has become an unavoidable issue with this increasing number of people living in urban areas. In terms of food
security, urban dwellers are more susceptible to food related issues compared to rural people, because the food is not produced sufficiently in urban areas due to limited land and the availability of infrastructure (FAO, 2009). If actions are not taken to adapt these challenges of population growth and urbanization in cities, it is expected that urban dwellers will become vulnerable to the complex issues such as food security. Therefore, urban food production has been identified as a source of income and a strategy for subsistence for urban dwellers. The need for a new, locally-grown food system has been highlighted especially in urban areas which can supply fresh and nutritious produce to consumers and processors (Blay-Palmer, 2008). The demand and recognition for urban food production are increasing in this context (van Veenhuizen, 2006). Therefore, it is important to identify and explore the perspectives of producers who are already engaged in farming in urban areas, to understand how to motivate more people towards urban farming and to make recommendations to urban Extension programs.

**Purpose and Objectives**

The overall purpose of this study was to identify producers’ perspectives of farming in urban areas in Columbus, Ohio. Three specific studies were conducted to meet the overall purpose of this study. The purpose of the first study was to describe how the information needs and information-seeking behavior of urban food producers influence their perceived behavioral control towards urban farming. The specific objectives that guided the study were to,

- identify the most needed information of urban food producers,
- identify factors urban food producers consider when selecting an information source,
- identify the frequency of using the given information source,
- identify the level of trustworthiness associated with each of the information sources as perceived by urban food producers,
- describe the frequency of interaction urban food producers have with the Cooperative Extension Service (CES),
• determine the level of satisfaction urban food producers associate with the services offered by the CES, and

• describe the overall perception of food producers about CES.

The purpose of the second 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.

The third study aimed at describing the intention of urban food producers to continue producing food in urban settings. The specific objectives that guided the study were to,

• describe factors that influence attitude towards urban food production,

• describe the factors that influence perceived behavioral control towards urban food production, and

• describe factors that influence subjective norms towards urban food production.

**Significance of the Study**

The National Research Agenda of the American Association for Agricultural Education identified seven research priority areas for the years 2016-2020 (Roberts, Harder, & Brashears, 2016). Out of those seven, the design of this study is directly related to two priorities: efficient and effective agricultural educational programs and addressing complex problems. The study has both direct and indirect benefits to the stakeholders in the agriculture sector by identifying solutions to emerging problems with population growth and urbanization. Urban agriculture has the potential of addressing important issues related to agriculture in terms of food security, urban poverty, and social capital. Since urban farming may become very prominent in the future with the unprecedented rate of population growth, it is important to determine why producers adopt urban farming to make the transition process successful for others who are interested in urban farming. Next, through identification of their information and other program related needs, the
CES can take appropriate actions to meet these needs. Extension agents working in urban areas can use this information to help producers to overcome challenges and barriers associated with urban farming. Lastly, policy-makers can use this information to determine what regulatory actions are needed to support and promote farming in urban areas.

**Definitions of Terms**

**Barriers** – anything that holds apart, obstructs, or hinders (Murphy & Schiller, 1992). In this study barriers were operationalized as factors perceived by urban food producers that limit their ability or hinder, decelerate, or delay the process of producing food in urban areas.

**Cooperative Extension System** – “A public funded, non-formal, educational system that links the education and research resources of the U.S. Department of Agriculture, land-grant universities, and county administrative units. The basic mission of this system is to help people improve their lives through an educational process that uses scientific knowledge focused on issues and needs” (Seivers, Graham, Gamon, & Conklin, 1997, p. 244).

**Intention** - “The motivational factors that influence a behavior, they are indications of how hard people are willing to try, of how much of an effort they are planning to extend, in order to perform the behavior” (Ajzen, 1991, p. 181).

**Land-grant University** - “An institution that has been designated by its state legislature or Congress to receive the benefits of the Morrill Acts of 1862 and 1890. The original mission of these institutions, as set forth in the first Morrill Act, was to teach agriculture, military tactics, and the mechanic arts as well as classical studies so that members of the working classes could obtain a liberal, practical education” (NASULGC, 2007, para 1).

**Urban** – relating to or characteristics of a city. All territory, population, and housing units within an area consisting of a population density of 1,000 people per square mile. (United States Census Bureau, 2010)
Urban Food Producer - people who grow plants and/or keep animals, harvest and process them, and sell them to customers in and around cities (Louton, 2016).

Urban Extension – “CES in urban communities that educates people by engaging individuals, families, and communities in learning partnerships that result in informed decisions and the application of knowledge to solve critical issues for a sustainable future” (USDA, 1996, p. 5).

Urbanization – the process of making an area urban (United States Census Bureau, 2010).

Assumptions

• Urban producers’ desire to participate in this study was indicated by their honest and clear answers for the given sections of the instrument.

• Perspectives of urban food producers would help to improve the urban Extension programs.

Chapter Summary

The purpose of this study was to identify the perspectives of food producers regarding their experiences with farming in urban areas. In this introductory chapter, an overview of the urbanization was provided followed by a discussion on issues related to urbanization, urban Extension program planning, and the role of Extension agents. The importance of identifying needs of urban producers was highlighted in order to tailor successful urban Extension programs.
Chapter Overview

Chapter 1 provided the background and basis for the study. Barriers to urbanization were presented, followed by descriptions of program planning and professional development in Extension settings. The purpose of the study was presented along with specific research objectives.

This chapter outlines the theoretical and conceptual framework for the study. Theories related to behavioral intention are presented, along with the related literature on behavior change, adoption, program delivery strategies, and information-seeking behavior of food producers in urban areas.

Grand Level Theory: Social Constructionism

Social constructionism is a theory that is applied to understand the socially constructed nature of life. A sound theoretical framework is needed for studies to justify choices regarding the design of the study and to support the findings (Maxwell, 2013; Miles & Huberman, 1994). Vygotsky (1978) stated that interactions create the reality of a person. According to social constructionism, knowledge is sustained through social processes and that knowledge passes from person to person with social action (Young & Collin, 2004). Moreover, since knowledge is specific to culture, social practices, interactions, and processes should be the focus of study inquiry (Young & Collin, 2004). People are social beings. Therefore, they engage with others to make meanings rather than making the meaning individually (Crotty, 1998). All processes related to this study, including food production in urban areas, using information sources, and marketing food products, are all influenced by social interactions. This forms the theoretical basis of this study.
Theory of Planned Behavior

The Theory of Planned Behavior (TPB) is an extension of the theory of reasoned action (TRA) developed by Ajzen and Fishbein (1980). TPB has been widely and very frequently used in studies related to behavioral intentions, to make predictions about wide-range of behaviors (Conner & Sparks, 1996). The theory focuses on motivational and relevant cognitive factors of individuals to predict the performance of the behavior. According to the assumptions of the TPB, intention to perform a specific behavior is the determinant of that behavior. That intention is influenced by attitude, subjective norm, and perceived behavioral control (Ajzen, 1991) as depicted in Figure 2-1.

Figure 2-1. The theory of planned behavior (Ajzen, 1991)

One of the main assumptions of the TPB is that people consider both external and internal implications when making decisions (Ajzen, 1985). As explained by Ajzen (1985), the intention of an individual to the questioned behavior is the central determinant of TPB. Therefore, it is assumed that intention plays the most important role in satisfying the motivational component, which in turn determines the behavior of an individual. Attitude
towards the behavior, subjective norm, and perceived behavioral control are the three considerations consulted by an individual when the intention to perform a behavior is increased or decreased. Therefore, each of these determinants have their own belief structures: behavioral beliefs, normative beliefs, and control beliefs, respectively (Ajzen, 1985, 1991).

**Behavior**

Human behavior can be predicted by understanding an individual’s attitude, subjective norms, and perceived behavioral control (Ajzen, 1991). Apart from the three factors mentioned above, it is also important to consider the actual behavioral control, when predicting an individual’s behavior (Ajzen, 1991). The interaction between an individual’s motivation and ability can have an impact on the behavioral achievement (Ajzen, 1991). Therefore, the success of performing a behavior is dependent on available resources, available opportunities, and the intention of that individual (Ajzen, 1991).

**Intention**

Intention is the center of the theory of planned behavior (Fishbein & Ajzen, 1975). According to Ajzen (1991) “intentions are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior” (p. 181). Intention that leads to a given behavior is influenced by attitude, subjective norms, and perceived behavioral control. Therefore, an individual’s intention to perform a behavior can be predicted by understanding attitude, subjective norms, and perceived behavioral control (Ajzen, 1991). If the intention to perform a behavior is strong, an individual is more likely to perform that behavior (Ajzen, 1991).
Attitude towards Behavior

Attitude is one of the three determinants of behavioral intention. According to the theory of planned behavior, beliefs of an individual about the outcomes of his/her performance of the behavior, which is called “behavioral belief” is the determinant of that individual’s attitude towards the behavior. In other terms, if a person believes that the results of a performance are positive, then that person will have positive attitudes towards his/her behavior (Fishbein & Ajzen, 1975). Similarly, if an individual believes that negative results will occur as the anticipated results of the behavior, then he or she will have negative attitudes towards it (Ajzen, 1991). For example, if an urban food producer perceives that in-person training programs organized by the CES are helpful to increase his/her production, then that producer is more likely to attend those trainings.

Subjective Norm towards a Behavior

Perceived expectations of people who play important roles in the life-decisions of an individual are captured under the subjective norms. The approval or disapproval of those important people around the individual regarding the specific behavior of the individual, determine the subjective norm towards the behavior. If the individual thinks that the people around him/her approve of a specific behavior, then the individual will have positive subjective norms towards the intended behavior and have greater intent than if subjective norms were weak (Fishbein & Ajzen, 1975). The reverse will happen if the individual believes that the people around him/her will disapprove of his/her behavior by having negative subjective norms towards the behavior (Ajzen, 1991). According to Ajzen (2002), opinion leaders have a high potential of influencing other individuals towards adopting a behavior.

There is a direct relationship between normative beliefs and subjective norms (Ajzen, 1991). As mentioned in the previous paragraph, people who are very trustworthy to an individual
can influence the subjective norms (Ajzen, 2002). Examples of those trusted individuals are family members and opinion leaders (Ajzen, 2002). If the person is closer to the individual, he/she can have a great influence on that individual’s subjective norm. Therefore, an individual is more likely to engage in a behavior, which is encouraged by the people, who the individual interacts with more frequently. For example, if the president of an urban food producers’ organization mentioned that attending in-person training programs conducted by the CES are important to increase farm revenue, it is more likely that other urban food producers would attend the program. Therefore, the president of the farmer organization can influence the normative beliefs of other urban food producers.

**Perceived Behavioral Control towards a Behavior**

Individual perception towards the barriers and facilitators (control belief) for performing a behavior provide the foundation for perceived behavioral control (Ajzen, 1991). Perceived behavioral control directly and indirectly influences behavior. When an individual holds his intention constant towards a behavior, then the individual’s confidence towards performing that behavior is strongly influenced. This is the direct influence (Ajzen, 1991). If an individual believes that there would be some elements that prevent performing the behavior, then that individual is less likely to perform that behavior. The perceived difficulties could be personal, situational, or physical (Ajzen, 2002). For an example, if an urban producer perceives that driving to in-person trainings offered by the CES is difficult, then that urban producer is less likely to attend this training in the future. Ajzen (2002) also discussed the influence of situations for behaviors that are outside the control of an individual. For instance, if an urban food producer is having a problem with his truck which he usually drives to the farmers’ market then that limits his engagements towards selling produce at the farmers’ market. Therefore, if someone wants to
change the behavior of an individual, the influence of these external factors need to be considered.

Decomposed Theory of Planned Behavior

Taylor and Todd (1995) asserted the intention construct of the TPB is not unidimensional. They stated that intention is multidimensional and has more power of predictability than TPB to understand individual behaviors. Therefore, the Decomposed Theory of Planned Behavior (DTPB) was developed to better understand the effects of specific factors on behavior. DTPB is developed using both TPB (Ajzen, 1991) and the theory of diffusion of innovations (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) referred to three of the five attributes of an innovation used in the theory of diffusion of innovation. Those three attributes are relative advantage, compatibility, and complexity. Moreover, perceived behavioral control used in the 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 refers 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).

Conceptual Model

The DTPB which is the main theory used in this study is the basis for the conceptual framework of this research. The conceptual framework illustrates the behavioral intention of
food producers towards engaging in urban food production. A visual representation of the conceptual model used is presented in Figure 2-2.

Behavioral intention to continue food production in urban settings is influenced by attitude, subjective norms, and perceived behavioral control. According to the theory of planned behavior, perceived behavioral control is affected by resource accessibility and personal characteristics. In this conceptual model, resources include information and other specialized resources such as financial, transport, etc. This sets the background for the first objective of this study. The first objective of the study is to explore information needs and information-seeking behavior of respondents, which sought to describe the information needs and information-seeking behavior of urban food producers. Types of information sources preferred by urban producers, frequency of interaction with the CES, and satisfaction with the CES is explained under Chapter 3 of this document.

In this conceptual model, attitudinal belief is decomposed into relative advantage, compatibility, and complexity, to better explain the relationship between attitudes and intention. Taylor and Todd (1995) suggested a decomposition of attitudinal belief to get a better picture about the relationship between attitudinal belief and intention. Using Rogers’ (1983) diffusion of innovation theory, Taylor and Todd (1995) stated that attitudinal beliefs have three characteristics of an innovation namely relative advantage, complexity, and compatibility. Complexity is the degree of difficulty to operate, understand or learn (Rogers, 1983). Complexity has a negative relationship with attitude. In this conceptual model, perceived complexity in urban farming is considered to negatively predict urban producers’ intention. This sets the background for the second objective of the study. The second objective of this research was to describe the barriers faced by urban food producers. All the barriers associated with each construct of the
According to the conceptual model, attitudinal beliefs, perceived behavioral control, and subjective norms determine the behavioral intention to continue farming in urban areas. Attitudinal beliefs are decomposed into relative advantage, complexity, and compatibility. Relative advantage can be measured in terms of economic factors, social factors, convenience, and satisfaction (Rogers, 2003). Relative advantage is a decisive factor when making a decision towards a behavior (Pannell et al., 2006). Relative advantage should be positively relevant to the rate of adoption (Rogers, 1983). In this conceptual model, relative advantage refers to the degree to which urban farming provides benefits such as economic, image, satisfaction, and convenience compared to other livelihoods (Rogers, 1983). Complexity is the degree of difficulty to operate, understand, or learn (Rogers, 1983). Complexity has a negative relationship with attitude. In this conceptual model, perceived complexity in urban farming is considered to negatively predict urban producers’ intention. Compatibility refers to the degree of fit with existing values, previous experiences, and needs of urban producers. According to Tornatzkey and Klein (1982), when an innovation is compatible with the value system of an individual, it is more likely to be adopted. Therefore, it is expected the more one is engaged in urban farming, the more urban producers perceive it to be compatible with their lifestyle. Subjective norms are determined by referent influence and perceived behavioral control is influenced by resource availability and personal characteristics (Taylor & Todd, 1995). This formed the conceptual background for the third objective of this study. The third objective of the study was to describe the intention of urban food producers to continue producing food in urban areas. Chapter 5 of this document presents the findings relevant to that objective.
Figure 2-2. Conceptual model for the study

01 - Information needs and information-seeking behavior of urban food producers
02 - Challenges for food production in urban areas
03 - Intention to continue farming in urban areas


Related Literature

**Related Literature on Theory of Planned Behavior**

TPB has been used in a wide range of disciplines to understand factors that drive human behavior (Mattingly, 2012). The influence of positive attitude towards behavior has been reported in several research studies. When an individual has a positive attitude towards a behavior, he/she is more likely to engage in it (Kelly, 2008). Attitude has been identified as the strongest predictor of a behavior across different agricultural disciplines such as food consumption behavior (Spence & Townsend, 2006), environmental conservation behavior (Borges, Lansink, Ribeiro, & Lutke, 2014; Wu & Mweemba, 2010), and environmental activism (Kelly, 2008). Robinson and Smith (2002) in their study of food consumption behavior, stated that individuals who have strong confidence towards a product’s expected benefits have a different behavior compared to consumers who do not have strong beliefs towards product quality. Jager (2000) highlighted the importance of referents in such situations to influence the behavior of individuals. When an individual’s attitude towards a behavior is not very strong, he/she tend to consider other people’s opinion towards the behavior.

Perceived difficulty or ease towards a behavior is described by the perceived behavioral control. Moreover, the behavior is directly affected by perceived behavioral control through influencing factors that are outside of an individual’s control (Ajzen, 1985). This has been explored in several food consumption and health related behaviors. For example, Armitage and Conner (1999), in their study on preference for low-fat diets among undergraduate students, identified perceived behavioral control as a strong predictor of behavioral intention. Similar results were found in the study conducted by Lynne et al. (1995) about Florida Strawberry farmers’ water conservation adoption behavior. Borges et al. (2014) elaborated more by talking about the influence of perceived behavioral control, subjective norms, and attitudes towards a
behavior. The researchers studied cattle farmers’ behavior towards using natural grasslands in Brazil and concluded that the decisions on using natural grasslands are influenced by the farmers’ initial attitudes, subjective norms, and perceived behavioral control. But, Shaw, Radler, Chenoweth, Heiberger, and Dearlove (2011) in their study on the intention for rain-garden installation concluded attitude and subjective norms as positive behavioral predictors, while perceived behavioral control was not a significant predictor.

Perceived challenges and barriers also play a significant role in behavioral intention. According to Rehman et al. (2007), belief factors such as economic benefits have a positive influence towards behavior while technical literacy had a negative influence on behavioral intention. Sparks, Guthrie, and Shepherd (1997) applied TPB to food consumption behavior of people and identified external factors that could influence the purchasing behavior of individuals. Those external factors which could influence the purchasing behavior included time of purchase, labelling, and availability of products.

Behavioral intention is also influenced by personal and situational factors (Ajzen, 1985). Personality traits of an individual also play an important role in behavioral intention (Ajzen, 1985). Personality traits related to food consumption behavior included health beliefs of the individual, nutrition beliefs, convenience, money considerations, pickiness, and so on (Furst et al., 1996).

Related Literature on Decomposed Theory of Planned Behavior

Characteristics of an innovation have a great influence on the behavioral intention. Taylor and Todd (1995) conducted a study to determine consumers’ adoption behaviors towards a new product. The researchers used Rogers (1983) characteristics of an innovation to decompose attitude: relative advantage, complexity, and compatibility. Control beliefs were decomposed into self-efficacy, internal control to perform a behavior, facilitation conditions, and availability
of resources. Normative beliefs were not decomposed in that study. According to the findings, relative advantage, complexity, and compatibility were significantly related to attitudinal beliefs. Interestingly, the study also found a positive relationship between attitude and complexity. The more an individual perceives adopting a given behavior as difficult, the more positive that individual’s attitude towards it. The reason for that as explained by the researchers is, when a product’s specifications are displayed in an overly simplistic way, the customers are suspicious of it. Lim and Dubinsky (2005) conducted another study to determine consumer expectations of a product. In that study, behavioral beliefs were decomposed into the characteristics of the store, normative beliefs were decomposed into family and friends, and control beliefs were decomposed into self-efficacy and facilitating conditions. The results of the study revealed that interactivity, reliability, navigation characteristics, and merchandise are distinguishable dimensions of attitudinal beliefs. The family had the highest influence on normative beliefs. Moreover, self-efficacy and facilitating conditions were found to be significant predictors of control beliefs.

Ajjan and Hartshorne (2008), using DTPB identified factors that influence an individual to adopt a technology. In their study about the factors that influence adoption of Web 2.0 technology, the researchers concluded that intention to adopt Web 2.0 technology was positively predicted by attitude and perceived behavioral control. Hartshome and Ajjan (2009) determined the factors that influenced students to adopt the Web 2.0 tool and concluded that subjective norms were a significant predictor for behavioral intention. Moreover, the researchers also examined that the use of Web 2.0 was influenced by factors such as compatibility, ease of use, and influence from peers.
Relative advantage and intention towards behavior

Several studies have been conducted in the field of agriculture to determine the importance of relative advantage towards the behavior of individuals. When an individual perceives there are benefits attached to performing a behavior he/she is more likely to adopt that behavior (Taylor & Todd, 1995). Some examples for agriculture related studies that explored the relationship between relative advantage and behavioral intention include willingness of small-scale Malawi farmers to participate in tree planting programs (Maijer, Catacutan, Sileshi, & Nieuwenhuis, 2015), farmers’ adoption of nitrogen testing programs (King & Rollins, 1995), family forest owners adoption of sustainable forest management strategies (Germain, Ellis, & Stehman, 2014), and the adoption of an animal health network among state veterinarians (Moore, Murphy, Degenhart, Vestal, & Loux, 2012). According to the findings of those studies, an individual’s decision to adopt a behavior is influenced by benefits attached to performing that behavior. Economic benefits, accessibility, ease of use, and availability are some examples of benefits that have a positive influence on behavioral intention (Germain, Ellis, & Stehman, 2014; King & Rollins, 1995; Maijer et al., 2015; Moore et al., 2012). Germain, Ellis, and Stehman (2014) suggested conducting more awareness programs to increase the intention to engage in a given behavior.

Complexity and intention towards behavior

Complexity is the degree of difficulty to operate, understand or learn (Rogers, 1983). Complexity has a negative relationship with attitude. In the study mentioned above conducted by Moore et al. (2012), the participants indicated “easiness of the network to understand” (p. 4) as one of the factors that determine their adoption to the network. Therefore, the researchers suggested developing the network in a way that makes it easier for the state veterinarians to use easily. Williams, Strong, and Lockett (2013) conducted a descriptive study to explore the
possibility of establishing a relationship with cowboy church members as a strategy to expand the CES audiences. According to the findings, the researchers identified complexity as one of the important factors that hinders the adoption of an Extension program. It was further explained that complexity of a program varies from location to location.

Compatibility and intention towards behavior

Compatibility has a significant influence towards behavioral intention. Compatibility refers to the degree of fit with existing values, previous experiences, and needs of urban producers (Rogers, 1983). According to Tornatzkey and Klein (1982), when an innovation is compatible with the value system of an individual, it is more likely to be adopted. Similar results about relationship between compatibility and intention were reported in studies conducted about farmers’ adoption of nitrogen testing programs (King & Rollins, 1995) and an Extension Master Gardener record keeping system (Dorn, 2016).

Summary of TPB in Agriculture

As a summary, the theory of planned behavior has been used widely in the field of agriculture and natural resources. According to the results of the studies conducted using this theory, intention to engage in a given behavior is positively or negatively influenced by attitude, subjective norms, and perceived behavioral control. There are several factors that are decisive to attitude, subjective norms, and perceived behavioral control. Those decisive factors could vary according to the context.

Related Literature about Urban Food Producers

Several studies have reported substantial benefits of urban farming, in terms of its social, health, and economic impacts. As mentioned by Surls et al. (2014), beautifying the neighborhood, creating educational and youth development opportunities, providing access to land, building social capital in the community, and enhancing community development are some
of the important social impacts of urban food production. Access to food, increasing vegetable and fruit consumption, food literacy and health literacy, and improvement of the well-being of urban dwellers are some of the health-related advantages of urban farming. According to Feenstra and Lewis (1999), community food programs, Community Supported Agriculture (CSA), and farmers’ markets in urban areas play an important role in increasing food security through nutrition awareness programs, healthy cooking events, and healthy cooking practices. Economic impacts of urban Extension programs include market expansion for urban producers, reduction of food expenditures, increasing home values, creating jobs, and training and job incubation. According to Surls et al. (2014) many agriculture related projects in urban areas have skill development training programs for urban youth, which employ and motivate urban youth to administer urban farms. Therefore, urban agriculture has “a potentially positive impact on job creation and revenue generation” (p. 36).

Stone (2016) explored the advantages of urban farming in terms of market access, growing condition, start-up cost, pest and disease control, and access to infrastructure. Stone (2016) has been an urban farmer, and according to his experiences, having access to markets is the biggest advantage of urban farming compared to other types of farming. Since urban areas are highly populated compared to rural areas, availability of markets is higher than that of rural areas. Therefore, cost and distance of transportation of produce to the markets are comparatively lower in urban areas, which facilitates an urban producer’s ability to supply fresh produce to their customers, which appeals to them. “What other farmers have the ability to do that?” (Stone, 2016, p. 4). According to Stone (2016), start-up cost such as capital, infrastructure, and other facilities are comparatively lower in urban areas because they are already available and easy to access compared to rural areas.
Oberholtzer, Dimitri, and Pressman (2014) conducted a national survey to identify characteristics, challenges, and technical assistance needs of urban farmers in the United States. The researchers identified that many farmers and farms are new to urban agriculture. The majority of the urban producers produced fresh vegetables followed by nursery items, fresh fruits, and meat. When the production practices were considered, the majority of urban farmers used raised beds followed by greenhouses, container gardens, and high tunnels. The majority of urban producers sold their produce to farmers’ markets and CSA. Production costs, including pest and weed control was identified as the most critical challenge by the respondents followed by availability of water, infrastructure facilities, and availability of farm labor. When the producers were asked about their information needs, most of them mentioned the lack of technical information, financial planning information, marketing, and distribution related information. An important finding of this study was that urban producers do not rely on Extension agents for their information needs. Therefore, the researchers highlighted the need of reaching out to urban producers with Extension materials and methods that can fit the needs of urban producers.

Even though available literature that compares rural and urban farming is very limited, there are a few studies that discuss some of these differences. Stone (2016) stated that “an urban farmer has the ability to be more than just a farmer” (p. 6) because of the differences in urban farming compared to other forms of farming. Those differences include social connections and localization. There are differences between urban and rural producers in terms of culture, education, and economy even though these factors are highly interdependent (COST Action Urban Agriculture Europe, 2013). As explained by Stone (2016), urban areas have more people compared to rural areas. Having more people offers different opportunities for urban farmers to
be a community leader who could guide, demonstrate, and educate fellow urban dwellers about farming, because a few people in urban areas are involved in urban farming. Therefore, the status potential for urban farmers in his/her community may be higher than that for rural farmers, because in rural areas the livelihoods of most of the people are connected to agriculture.

In conclusion, urban food production has its own unique characteristics that differentiate it from rural food production. Similarly, the challenges faced by urban food producers are also different from rural producers. Therefore, there is a need to address these challenges, by understanding the diversity of urban areas while considering the rural and urban difference.

**Related Literature on Information Needs and Information-Seeking Behavior of Urban Food Producers**

Even though urban agriculture is growing throughout the country, available literature on the information needs and information-seeking behavior of urban food producers is limited. Urban producers use a variety of information sources. Harms, Presley, Hettiarachchi, and Thien (2013) assessed the soil related educational needs of urban food producers and urban gardeners and concluded that urban producers are not very knowledgeable about topics related to their practices. The various information sources used by urban food producers included Extension agents, government sources, university sources, internet, and nonprofit organizations. Therefore, the researchers suggested having collaborations among these different sources for better dissemination of information.

Information needs in urban areas are context specific and depend on several factors (Byamugisha, Ikoja-Odongo, & Nasinyama, 2010). A study was conducted to identify information needs and use among urban farmers in Uganda. The researchers concluded that information needs in urban areas are context specific and vary according to the activities and tasks of individual farms and heterogeneity of the farm (Byamugisha et al., 2010). They
identified several factors that determine the use of information sources such as the value urban farmers attach to different information sources and the characteristics of farmers such as the level of education and income, social factors, and organizational factors.

The importance of using digital and online information sources have been highlighted in literature. Surls et al. (2014) conducted a study to identify the information needs of California’s urban farmers. In that study, the respondents preferred online information sources more. As a result, the researchers suggested Extension professionals should consider utilizing online resources to supplement existing Extension approaches such as farm visits and workshops. Because of the diversity in urban areas, some of the respondents also suggested providing training materials in different languages.

Factors that hinder the effectiveness of information sources were identified in the study conducted by Angello, Msuya, and Matovelo (2016). They assessed the use of information by urban livestock farmers in Tanzania. In this study, the researchers identified that livestock farmers use a variety of sources such as Extension agents, veterinary shops, agricultural exhibitions, seminars, and other printed sources to access information. The researchers identified several factors that hinder the effectiveness of those information sources such as a lack of professional experience, cost, the lack of incentives to Extension agents, unavailability of seminars, and inaccessibility to printed sources. Therefore, the study recommended increasing the number of Extension agents in urban areas, providing infrastructure and communication facilities to Extension agents, and developing IT skills of Extension agents to improve the urban livestock sector.

According to the findings discussed in this section, understanding the sources of information preferred by food producers is important to deliver Extension information.
effectively. The type of source preferred, depends on several factors such as availability, cost, accessibility, and time. Therefore, effective Extension programs need to consider these factors when tailoring Extension programs to urban audiences.

**Related Literature on Education Program Delivery Strategies**

Disseminating information to clients is one of the key principles of Extension (Suvedi & Kaplowitz, 2016). “One major strength of Extension has been the development of programs based on the needs of people” (Brown, 1965, p. 3). Because of the interdependent nature of rural and urban communities, “it is not feasible or efficient to isolate the rural segment from the urban” (Brown, 1965, p. 3).

Mechanisms of disseminating information “have been shifting from authoritative sources to people’s social networks” (Diem, Hino, Martin, & Meisenbach, 2011, para.1). The way information is disseminated should facilitate its use by clients. Therefore, determining the most appropriate method for the target audience is a challenge for Extension (Cartmell II, Orr, & Kelemen, 2006).

According to Creighton, Baumgartner, and Gibbs (2002), those “living in the urban/rural interface have diverse interests and unique concerns” (para. 3). Sclar, Cranshaw, Jacobi, and Fleener, (1997) mentioned that most urban homeowners used home/garden center outlets as information sources to receive pest management related information. Kudryavstev, Krasny, Ferenz, and Babcock (2007) examined the computer technology usage by educators who work in urban, low-income communities. This study suggested using “new and innovative computer uses in educational programs and provided discussions of the values of these technologies as a professional development and educational tool” (Kudryavstev et al., 2007, p. 9). Another interesting suggestion from this study was “knowing that youth are motivated by using ‘hip’ technologies, Extension should make a concerted attempt to engage youth and adults by working
closely with youth in designing the technology component of their program” (Kudryavstev, et al., 2007, p. 9).

Mains, Jenkins-Howard, and Stephenson (2013) and Kinsey (2010) concluded that social media could be used to market Extension programs. With this in mind, the marketing team of the West Virginia Urban Agriculture Conference used an innovative visual messaging strategy to promote Extension initiatives, which resulted in outstanding success (Browning & Herrick, 2014). That marketing campaign used a unique logo of a chicken, “who shared his journey from the farm to the city via social media” (Browning & Herrick, 2014, p. 1). According to Browning and Herrick (2014), this program demonstrated how Extension could reach urban audiences and be sustainable with limited budgets when social marketing campaigns are implemented. Mains et al. (2013) suggested that the thoughtful use of Facebook could be used to share Extension program information, improve communication, and market Extension cost effectively.

Brown (1965) identified some internal and external organizational factors that affect the adoption of Extension in urban communities. Even though this study was done several decades ago, the findings of this study still remain viable for current Extension programs in urban environments. According to Brown (1965), content of Extension programs, goals or objectives of the organization, methods and techniques used, personnel factors, available resources, support for clientele, and the public are important organizational factors that determine the adoption of Extension programs in urban communities.

The CES uses different strategies to deliver information. Most of the training materials and disseminating strategies have been traditionally focused on rural context, because Extension originated in the rural areas. However, when designing programs specific to urban context, the
difference between rural and urban areas needs to be considered in order to deliver program effectively.

Summary

In conclusion, this chapter explained the epistemology and theoretical perspective used in this study. The theory of planned behavior and its constructs were explained followed by the conceptual framework of the study. Related literature was presented about the theory of planned behavior, the decomposed theory of planned behavior, information needs and seeking behavior of urban farmers, urban food production, and challenges for urban Extension.
CHAPTER 3
INFORMATION NEEDS AND INFORMATION-SEEKING BEHAVIOR OF URBAN FOOD PRODUCERS: IMPLICATIONS FOR URBAN EXTENSION

Introduction

With the increasing population, there is a rapid growth of the number of people living in urban areas nationally and internationally. Urban populations in the U.S. have grown from 68.3% to 71.2% of the total population from 2000 to 2010 and is projected to grow more (Urban Area Criteria for the 2010 Census, 2011; U.S. Census Bureau, 2010). With the increasing population, urban cities face challenges in providing resources and fulfilling basic needs of urban dwellers. Cities need to support the basic needs of the increasing number of people migrating into cities, including food, drinking water, sanitation, waste management, healthcare, education, and employment (van Veenhuizen & Danso, 2007). Since cities have limited resources and infrastructure to meet these requirements, inequality, poverty, malnutrition, food insecurity, and environment degradation have become critical issues in urban areas with the continued urbanization (Ramankutty, Foley, & Olejniczak, 2002; van Veenhuizen & Danso, 2007). In this context, having a continuous and sustainable food supply in the city is very important to mitigate many of the critical issues mentioned above.

The Urban Agriculture Committee of the Community Food Security Coalition (2002), defined urban food production as “the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities” (p. 4). Even though it is manifested as vegetable and fruit production in many cases, it varies widely (Viljoen, 2005). Urban food production has been identified as an important component of urban sustainability (Alberti, Marzluff, Shulenberger, & Bradley, 2003; van Veenhuizen & Danso, 2007). The demand and recognition for urban food production is increasing globally as a sustainable development strategy in cities (van Veenhuizen, 2006). When food is produced
within a city, the cost of transportation, processing, and packaging is less, compared to food produced outside of a city (Mendes, 2006; Mougeot, 2006). Building community and social capital, self-sufficiency, and creating local resilience are other advantages of urban food production (Brown & Jameton, 2000). Because of these positive aspects, urban agriculture has been identified as one of the most important priorities for many cities in North America (CRD Roundtable on the Environment, 2006).

Some prominent characteristics of urban food production are, space limitation, proximity to markets, minimum degree of farmer organizations, high specialization, production of perishables, limited space, and high competition for land (van Veenhuizen, 2006). Not only nationally, but also internationally efforts have been taken to improve food production in urban areas as a sustainable urban development strategy (van Veenhuizen, 2006). Greening urban cities, utilizing organic waste, reducing pollution, minimizing heat, and improving air quality are some of the advantages of urban food production. It also helps to building community and social capital, which in turn creates self-sufficiency and social resilience (Brown & Jameton, 2000). For these reasons, the attention for urban vegetation and urban gardening has increased, as they contribute to improve the quality of urban life by offering opportunities for mental relaxation, social integration, and physical exercise (Lee & Maheshwaran, 2011).

Literature Review

Information as a Determinant of Perceived Behavioral Control

Information-seeking behavior is the “gap bridging process, where individuals make moves, influenced by information in time and space to reach desired outcomes” (Sturge & Chimseu, 1996, p. 136). Ajzen and Fishbein (1980) in the TPB identified attitude, subjective norm, and perceived behavioral control as determinants of behavioral intention. Taylor and Todd (1995) added more to this by deconstructing TPB and explored the factors that influence attitude,
subjective norms, and perceived behavioral control. As explored by Taylor and Todd (1995) in their DTPB, an individual’s belief towards performing a behavior (perceived behavioral control) is influenced by the availability of information about that behavior. When an individual is confident about the availability of resources towards performing the behavior he/she is strongly influenced to perform that behavior (Ajzen, 1991). For example, when urban producers perceive that they possess information that decreases the perceived difficulty of engaging in urban food production, they are more likely to engage in that behavior. If the urban producers believe there would be elements that prevent the availability of information, then they are less likely to perform the behavior. Tying these theories to the context of urban food production, this chapter explores how urban food producers’ information needs and information-seeking behavior influence their behavioral intention towards urban food production.

**Information Needs and Seeking Behavior of Food Producers**

Agricultural information acts as a determinant factor for the success of agricultural farms and other related enterprises (Boehlje & King, 1998). Having an understanding about what, when, and how urban producers gather information is important to address their needs. When the information received is relevant, up-to-date and, meets clients’ needs that enables their ability to adopt new ideas and innovative technologies, providing more opportunities for success (Mchombu & Cadbury, 2006). Therefore, understanding the sources of information preferred by food producers and their information-seeking behavior is needed to predict their future engagement with urban food production.

Information-seeking behavior of an individual is influenced by various factors such as culture, economy, the level of education, technology, and environment (Sturge & Chimseu, 1996). By understanding the information needs and information-seeking behavior of urban
agriculture producers, we can map how urban producers’ knowledge is constructed and how they are influenced by different sources of information.

In his theory of *Diffusion of Innovations*, Rogers (2003) mentioned about cosmopolite sources and localite sources of information, from which individuals receive new information. Sources that are outside to an individual’s immediate connections were described as cosmopolite sources. Localite sources are the sources that lie within the immediate connections of a person. According to Rogers, cosmopolite sources have access to different information hence, they have the potential to bring in new information compared to localite sources. Moreover, Granovetter (1973), talked about strong ties and weak ties through which information flows to networks. Strong ties are the connections between individuals and his/her close social network circle. Weak ties are the connections between individuals and outside his close social network. New information flows more through weak ties than through strong ties (Granovetter, 1973) because connections in the close network circle of an individual tend to move similar to that individual. Therefore, weak ties play an important role in allowing an individual to access new information. Individuals are more likely to trust and perceive as credible information sources that are similar to themselves (Rogers, 2003).

Even though urban agriculture is growing throughout the country, there is limited literature on the information needs and information-seeking behavior of urban food producers. Information needs of urban producers are context specific and depend on several factors (Byamugisha, Ikoja-Odongo, & Nasinyama, 2010). Those factors include value urban farmers attach to different information sources, characteristics of farmers such as level of education, income, gender, and homogeneity or heterogeneity of the farm (Byamugisha, et al., 2010). Urban producers use various sources of information. Identifying these different sources of information
used is important for information dissemination (Duram & Larson, 2001). The Internet, government information sources, university sources, Extension agents, non-profit organizations, and exhibitions are some of the information sources used by urban food producers (Angello, Msuya, & Matovelo, 2016; Harms, Presley, Hettiarachchi, & Thien, 2013). Out of those sources, online sources are mostly preferred by urban producers compared to other sources (Surls et al., 2014). Therefore, promoting collaborations among different information sources, using more online sources to supplement existing information dissemination approaches, and providing information in different languages is important in urban areas (Angello et al., 2016; Harms et al., 2013; Surls et al., 2014).

**Purpose and Objectives**

The purpose of this study was to describe how the information needs and information-seeking behavior of urban food producers influence their perceived behavioral control towards urban farming. The specific objectives that guided the study were (a) to identify the most needed information of urban food producers, (b) to identify factors urban food producers consider when selecting an information source, (c) to identify the frequency of using given information source (d) to identify the level of trustworthiness associated with each of the information source as perceived by urban food producers, (e) to describe the frequency of interaction urban food producers have with the Cooperative Extension Service (CES), (e) to determine the level of satisfaction urban food producers associate with the services offered by the CES, and (f) to describe the overall perception of food producers about CES.

**Method**

This study was a mixed method study. According to Creswell (2013), when qualitative or quantitative research designs, each by itself, are unable to provide a complete understanding of the research problem, and the strength of the data collected through qualitative or quantitative
designs is inadequate, a mixed method approach is useful. Since analysis of data requires extra time, mixed method research is ideal for a researcher who enjoys “the structure of quantitative data and the flexibility of quantitative inquiry” (Creswell, 2013, p. 21). Therefore, a mixed method research approach was used for this study to develop a more detailed description of a phenomenon of individuals involved in it. The methodology of the study included a semi-structured interview and a questionnaire.

**Instrumentation**

A questionnaire was developed to collect quantitative data. A hybrid of several instruments that measured information-seeking behavior, trust, and satisfaction were used, based on the work of Mugwisi, Ocholla, and Mostert (2014), who developed a questionnaire on information needs of agricultural researchers and Extension workers in Zimbabwe. The UF/IFAS Extension Customer Satisfaction Survey (Israel, 1997) was used to capture the interaction and satisfaction with the CES. The first section of the questionnaire required respondents to indicate the type of information they needed to improve their production and to be successful urban producers. The respondents were then asked about the factors that urban producers consider when selecting an information source. Respondents were asked to rank the level of importance they associate with cost, credibility, relevance, availability, and time when selecting an information source.

The second section consisted of two subsections. In that section, the respondents were given 20 sources of information and were asked to rank them according to the frequency of use (1 = never use, 2 = less than once a month, 3 = about 1-2 times a month, 4 = once a week, 5 = several times/week). In the same sub section, the respondents were asked to rank the level of trust they associate with the quality of each information source on a scale of five (1 = very poorly trust, 2 = poorly trust, 3 = moderately trust, 4 = highly trust, 5 = very highly trust). The next
section was about the interaction of urban food producers with the CES. In that section, first, the respondents were asked to indicate the frequency of interaction they have with the CES on a scale of five (1 = Never use, 2 = Use 1-2 times/year, 3 = Use 3-4 times/year, 4 = Use about monthly, 5 = Use about weekly). Then the respondents were asked to indicate their level of satisfaction with the services offered by the CES on a Likert-type scale of five (1 = very dissatisfied, 2 = dissatisfied, 3 = neither satisfied nor dissatisfied, 4 = satisfied, 5 = strongly satisfied). Demographic data were also collected. Those data included (a) gender, (b) area of residence, (c) years of experience as an urban food producer, (e) highest education level earned, (f) age, (g) gross annual income from urban food production, and (h) market places for their produce.

Individual interviews with commercial urban producers were conducted to collect qualitative data. A researcher-developed interview guide was designed based on the conceptual framework used for the study. The interview guide development process included several important steps such as literature review, feedback from a panel of experts, and approval from the institutional review board (IRB) of University of Florida. The questionnaire included open-ended questions about the information needs and information-seeking behavior of urban food producers. According to the developed qualitative interview guide, first, the respondents were asked about their most needed information to continue urban food production. Then the respondents were asked about their perception towards different information sources they receive information from. Finally, the respondents were asked their opinion about the services offered by OSU Extension.

To ascertain that the developed instruments measured the constructs, steps were taken to overcome threats to validity, reliability, and sources of error. To overcome threats to internal
validity, items adapted from other instruments were kept unchanged and data were collected within a limited period. Threats to statistical validity which is caused due to errors in statistical interpretations and wrong data analysis (Ary et al., 2014) were overcome by getting feedback from a panel of experts. By using established instruments, threats to construct validity were addressed. A panel of experts who had expertise in urban Extension, agricultural education and communication, and survey design and research were used to further establish to construct validities.

Reliability is “the degree of consistency with which it measures whatever it is measuring” (Ary et al., 2014, p. 231). There should be a consistency of the scores achieved in the study in order for the test to be reliable. A practice test was conducted before the actual data collection to establish reliability. Needed changes were done to the instrument based on the results of the pilot study.

Establishing trustworthiness is important in qualitative studies. Lincoln and Guba (1985) used the term trustworthiness to talk about the validity of qualitative research. Lincoln and Guba (1985) identified four criteria to determine the trustworthiness of qualitative research: credibility, dependability, confirmability, and transferability. Triangulation and member checking were used to establish credibility. Multiple data sources such as researcher notes and audio transcriptions were used to establish credibility of the collected data. After the data were transcribed, they were sent to the respondents to review for accuracy. According to the feedback from the respondents, needed changes were done to the transcriptions to ensure the accuracy of the transcribed data. Transferability was established through thick description and confirmability was established through an audit trail. 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).
Transferability measures as it relates to thick description, the participants of this study were chosen based on having urban farming experiences in Columbus, Ohio. 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). Throughout this study the researcher maintained a journal to take notes of each visit to individual producers. Audio records of each interview were listened multiple times for understanding. Transcriptions of the interviews were checked with the audio to ensure accuracy. All the reflective processes, notes, and data analysis used in this study were documented.

**Population and Sample**

The target population for this study was commercial urban food producers in the city of Columbus, Ohio. Columbus was purposively selected for this study because it is a national leader in urban Extension and has branded Extension in the city as OSU Extension (National Urban Extension Leaders, n.d). OSU Extension has a presence in each county, linking communities to teaching, researching, and outreaching resources of Ohio State University. Commercial urban producers were defined as people who grow plants and/or keep animals, harvest and process them, and sell them to customers in and around cities (Louton, 2016). The sample was identified using a key informant with extensive experience in urban agriculture in Columbus (Ary, Jacobs, Sorensen, & Razavieh, 2014). Fifteen commercial urban producers were identified through purposive sampling based on a nomination from the urban Extension specialist of Ohio State University. Purposive sampling is a non-random sampling method (Ary et al., 2014). Snowball sampling was used to identify additional commercial producers. Snowball sampling is another purposive technique that helps the researcher to identify other participants through potential participants (Patton, 2002). Of the original nominated producers, eight agreed to participate.
These eight nominated an additional seven producers. In total, 15 commercial urban food producers participated in the study.

Out of those 15, 10 producers were female and 5 producers were male. Respondents have lived in urban areas an average of 15 years. When the respondents were asked about their highest level of education completed, 54% of the respondents had completed a 4-year college degree followed by 15%, 16%, and 15% of respondents who had completed some college education, graduate or professional degree, and high school, or GED respectively. Respondents were also asked about their gross annual income from urban farming. About 70% of respondents stated that their annual income was below $10,000. Fifteen percent of 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. Respondents’ average years of experience as urban farmers was 6 years.

Table 3-1 provides a summary of each of the respondents interviewed for this study.

<table>
<thead>
<tr>
<th>Respondent no</th>
<th>Gender</th>
<th>Years of urban farming in Columbus</th>
<th>Farm Production in Acres</th>
<th>Type of produce</th>
<th>Marketing strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Female</td>
<td>6</td>
<td>0.3</td>
<td>Vegetables, Fruits, Herbs, Forage</td>
<td>Wholesale, Farmers’ market, Restaurants</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
<td>6</td>
<td>0.1</td>
<td>Vegetables, Fruits, Plants</td>
<td>To Neighbors</td>
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<tr>
<td>3</td>
<td>Female</td>
<td>4</td>
<td>0.05</td>
<td>Vegetables, Fruits, Livestock</td>
<td>On-farm sales, CSA (Community Supported Agriculture)</td>
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<td>4</td>
<td>Female</td>
<td>4</td>
<td>6.0</td>
<td>Vegetables, fruits</td>
<td>Wholesale, Restaurants, CSA</td>
</tr>
<tr>
<td>Respondent no</td>
<td>Gender</td>
<td>Years of urban farming in Columbus</td>
<td>Farm Production in Acres</td>
<td>Type of produce</td>
<td>Marketing strategy</td>
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<tr>
<td>5</td>
<td>Female</td>
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<td>8.0</td>
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<td>Wholesale</td>
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<td></td>
<td></td>
<td></td>
<td>Fruits</td>
<td>Farmers market</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Restaurants</td>
</tr>
<tr>
<td>6</td>
<td>Male</td>
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<td>2.0</td>
<td>Vegetables</td>
<td>Farmers’ market</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>Fruits</td>
<td>On-farm sales</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Livestock</td>
<td>CSA</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Fish</td>
<td></td>
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<td>Honey</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Male</td>
<td>0.3</td>
<td>5.0</td>
<td>Vegetables</td>
<td>Farmers’ market</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fruits</td>
<td>Restaurants</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>On-farm sales</td>
</tr>
<tr>
<td>8</td>
<td>Male</td>
<td>7</td>
<td>0.1</td>
<td>Vegetables</td>
<td>Wholesale</td>
</tr>
<tr>
<td>9</td>
<td>Female</td>
<td>1.5</td>
<td>5.0</td>
<td>Vegetables</td>
<td>Farmers’ market</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flowers</td>
<td>On-farm sales</td>
</tr>
<tr>
<td>10</td>
<td>Female</td>
<td>0.75</td>
<td>4.0</td>
<td>Livestock</td>
<td>Wholesale</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Eggs</td>
<td>Farmers market</td>
</tr>
<tr>
<td>11</td>
<td>Female</td>
<td>10</td>
<td>10.0</td>
<td>Cut flowers</td>
<td>On-farm sales</td>
</tr>
<tr>
<td>12</td>
<td>Male</td>
<td>2.5</td>
<td>6.0</td>
<td>Vegetables</td>
<td>Farmers’ market</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fruits</td>
<td>Restaurants</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Livestock</td>
<td>Wholesale</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bee keeping</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mushroom</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Female</td>
<td>1</td>
<td>20.0</td>
<td>Vegetables</td>
<td>On-farm sales</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fruits</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Female</td>
<td>3</td>
<td>6.0</td>
<td>Vegetables</td>
<td>Farmers’ market</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fruits</td>
<td>Restaurants</td>
</tr>
<tr>
<td>15</td>
<td>Male</td>
<td>1.5</td>
<td>7.0</td>
<td>Vegetables</td>
<td>On-farms sales</td>
</tr>
</tbody>
</table>

**Data Collection and Data Analysis**

Data collection was conducted in January of 2017. The lead researcher visited each respondent personally to collect data. Interviews were conducted on the farm premises of the respondents. The purpose of the research was explained and informed consent was obtained.
Casual conversations were made with respondents to build rapport as suggested by Creswell (2013). The researcher spent an average of 2-3 hours with each respondent interviewing, observing, touring their farms, and shadowing the respondents during their farm operations. Each respondent took approximately 20-30 minutes to complete the questionnaire. Interviews lasted an average of ten minutes with each respondent beyond the questionnaire. All the interviews were voice recorded with the permission of the respondents. Researcher notes were also taken.

The conceptual model developed by the researcher was used as the guide for data analysis. The constructs developed in the conceptual model were considered as the base for thematic areas identified through data analysis. The data were transcribed first by the researcher. In order to understand the data deeply, transcriptions were read several times (Ary et al., 2014). To identify categories, line-by-line open coding was used as suggested by Strauss and Corbin (1990). After the initial analysis, those identified categories and respondents’ quotes related to each category were recorded on a spreadsheet. Descriptive statistics were used to summarize quantitative data. Standard procedures to calculate frequencies, means, and standard deviation were used to analyze this data.

Results

Most Preferred Information for Urban Producers

According to the responses provided to the open-ended question in the questionnaire, the most needed information for urban farming selected by respondents were related to increasing production (R3, R4, R7, R8, R9, R11, R13, R15), pest and disease control (R2, R4, R9, R15), information on available resources (R7, R8, R11), marketing and business management (R5, R3, R12, R10), and grant and other funding opportunities (R1, R3, R5, R7).
Factors Considered when Selecting an Information Source

Majority of the respondents considered cost of access to the source, credibility of the source, relevance of the information source, availability of information on time and time taken to access the information very important (Figure 3-1). Out of those factors, credibility of the information source was considered more important than other factors.

Figure 3-1. Level of importance associated with factors considered when selecting an information source

Frequency of Using Information Sources

The results indicated that respondents use a variety of information sources (Table 3-2). Out of the thirteen sources of information given, the Internet is the most frequently used source of information by respondents followed by friends and co-workers, and family and close
relatives. Events at research centers, newspapers, commercial trade shows, neighbors, and local garden stores were the least frequently used sources of information.

Table 3-2. Information-seeking frequency of respondents

<table>
<thead>
<tr>
<th>Source</th>
<th>Never Use %</th>
<th>Use 1-2 times per year %</th>
<th>Use 3-4 times per year %</th>
<th>Use about monthly %</th>
<th>Use about weekly %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>20</td>
<td>72</td>
</tr>
<tr>
<td>Friends or co-workers</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>27</td>
<td>40</td>
</tr>
<tr>
<td>Family members or close relatives</td>
<td>27</td>
<td>13</td>
<td>13</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>University web sites</td>
<td>7</td>
<td>20</td>
<td>20</td>
<td>27</td>
<td>20</td>
</tr>
<tr>
<td>Company web sites</td>
<td>14</td>
<td>27</td>
<td>7</td>
<td>34</td>
<td>14</td>
</tr>
<tr>
<td>Food production magazines</td>
<td>14</td>
<td>34</td>
<td>34</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Television programs</td>
<td>60</td>
<td>14</td>
<td>7</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Neighbors</td>
<td>20</td>
<td>20</td>
<td>47</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Local garden store</td>
<td>27</td>
<td>27</td>
<td>20</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Articles in the local newspaper</td>
<td>47</td>
<td>20</td>
<td>20</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Consultations with university specialists</td>
<td>14</td>
<td>27</td>
<td>40</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Commercial Trade Shows</td>
<td>34</td>
<td>47</td>
<td>14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Events at Research Centers</td>
<td>40</td>
<td>47</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Internet**

Time to access, availability, and cost of access has made the Internet the most convenient source of information for respondents (R1, R3, R5, R6, R8, R9, R11, R12, R13, R15). The Internet is a very powerful method based on the fact that the respondents are able to gain access to this source in the convenience of their home, instead of going elsewhere. As stated by R12, the Internet is the “cheapest and most effective source of information. So why not use it?”

The respondents use social media applications on the Internet to share information and to communicate with other producers. Facebook is the mostly used Internet application by the
respondents. Almost all the respondents are members of different Facebook groups which are relevant to urban farming. These Facebook groups related to farming have members from around the world. Members of these farming related social media groups represent a wide variety of agricultural professionals such as researchers, food producers, Extension officers, authors etc. Therefore, Facebook has become a very trustworthy, convenient, and inexpensive way to share, learn, research, disseminate and to consult for information. According to the discussions with the respondents, most of them are accustomed to posting on Facebook groups before reaching out to other sources, whenever they have a problem that needs to be solved on the farm. R3 stated that the Facebook groups give her the opportunity to “communicate with other urban producers who are steps above her in scale and in the market.” For R12, the biggest advantage of using Facebook groups is the opportunity it provides to interact with “the people” in the urban agriculture sector who have contributed a lot in terms of research and publications.

Thankfully, there’s groups on Facebook that I'm in where it's – in my opinion the best farmers in the whole country if not the whole world. It's all these people that wrote these books in there and they'll talk to you like you're a normal person. They're just awesome humble people. (R12)

Other than Facebook, some respondents also use YouTube (R15, R 10, R3, R 6), online blogs maintained by other urban producers (R1, R3, R6, R7), and online publications by different institutions (R4, R10).

**Friends and co-workers**

Urban producers are their own sources of information. Almost all the producers interviewed for this study stated that they consult their friends and co-workers for information. R1 stated that her first source of information was her friends who she meets in the farmers’ market. Whenever she has a problem she is used to reaching out to those friends because “they have a little bit more experience dealing with problems, they got a little more crop variety and a
little more land. And they’ve been in production for a longer.” According to the experiences of R3, she felt very comfortable talking to her friends whenever she had a problem that needed to be solved on the farm.

**Trustworthiness of Sources of Information**

Table 3-2 presents the findings of the trustworthiness of different sources of information. According to the findings, most of the respondents trust university resources over other resources because the university experts are more knowledgeable and have research backgrounds. Respondents are used to following different university resources that come from different universities.

Other resources that I found recently that I really like as well is that Michigan State Extension office has a handful of programs that really do a good job focusing on the small-scale farmers in particular. (R5)

Other than that, respondents also stated that they trust on-farm tours and demonstrations (R5, R7, R8, R10) because they get to see and feel the actual situation in those farms. Some respondents mentioned that they do not have time for farm visits, even though they prefer to go (R12, R 3, R1).

**Table 3-3. Trustworthiness of sources of information**

<table>
<thead>
<tr>
<th>Source of Information</th>
<th>Very poorly trust</th>
<th>Poorly trust</th>
<th>Moderately trust</th>
<th>Highly trust</th>
<th>Very highly trust</th>
</tr>
</thead>
<tbody>
<tr>
<td>University web sites</td>
<td>0</td>
<td>7</td>
<td>34</td>
<td>14</td>
<td>40</td>
</tr>
<tr>
<td>Consultations with university specialists</td>
<td>0</td>
<td>0</td>
<td>47</td>
<td>7</td>
<td>40</td>
</tr>
<tr>
<td>Demonstration gardens</td>
<td>7</td>
<td>0</td>
<td>20</td>
<td>27</td>
<td>40</td>
</tr>
<tr>
<td>Friends or co-workers</td>
<td>0</td>
<td>0</td>
<td>78</td>
<td>47</td>
<td>34</td>
</tr>
<tr>
<td>Local garden store</td>
<td>7</td>
<td>7</td>
<td>40</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>
Table 3-3, Continued

<table>
<thead>
<tr>
<th>Source of Information</th>
<th>Very poorly trust %</th>
<th>Poorly trust %</th>
<th>Moderately trust %</th>
<th>Highly trust %</th>
<th>Very highly trust %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Events at Research Centers</td>
<td>7</td>
<td>0</td>
<td>34</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Family members or close relatives</td>
<td>14</td>
<td>0</td>
<td>34</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>Commercial Trade Shows</td>
<td>0</td>
<td>20</td>
<td>27</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Company web sites</td>
<td>7</td>
<td>0</td>
<td>27</td>
<td>47</td>
<td>14</td>
</tr>
<tr>
<td>Food production magazines</td>
<td>7</td>
<td>14</td>
<td>34</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>Internet</td>
<td>0</td>
<td>0</td>
<td>47</td>
<td>20</td>
<td>14</td>
</tr>
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<td>Neighbors</td>
<td>7</td>
<td>67</td>
<td>7</td>
<td>7</td>
<td>7</td>
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<tr>
<td>Television programs</td>
<td>14</td>
<td>14</td>
<td>40</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Articles in the local newspaper</td>
<td>14</td>
<td>0</td>
<td>54</td>
<td>20</td>
<td>0</td>
</tr>
</tbody>
</table>

**Frequency of Interaction with the Cooperative Extension Service**

When the respondents were asked about their interaction with the CES, about 74% of the respondents stated that they have used the CES and about 14% of the respondents stated that they have never used the CES. Respondents who have never used Extension were asked about reasons they did not use Extension and they stated that they were unaware of its existence in the city. About 7% of the respondents use the CES monthly or weekly while about 40% and 27% of the respondents use the CES 1-2 times per year and 3-4 times per year respectively.

**Satisfaction about the Services Provided by the Cooperative Extension Service**

Only 13% of the respondents indicated they were highly satisfied with the overall services offered by the CES. About 27% of the respondents were satisfied with the overall services offered by the CES. About 7% of the respondents were highly dissatisfied with the overall services offered by the CES. About 20%, and 14% of the respondents were dissatisfied, and neither satisfied nor dissatisfied about the overall services by the CES respectively. Figure 3-
2 displays the results of the respondents’ level of satisfaction with different services offered by the CES.

![Bar chart showing satisfaction levels for different services](chart.png)

- How satisfied or dissatisfied are you that the information was up to date and accurate
- How satisfied or dissatisfied are you that the information was delivered in time to be useful
- How satisfied or dissatisfied are you that the information was relevant to your situation
- How satisfied or dissatisfied are you that the information was easy to understand

**Figure 3-2. Satisfaction with the services provided by the CES**

As mentioned in the previous section of this article, Extension is not the most preferred source of information by the respondents however, they trust Extension resources, because the information is coming from university research and university professionals. Their satisfaction about overall Extension service depends on several factors such as mode of delivery, time to access, and availability of information. During interviews, some respondents mentioned that the Extension services are useful for basic information only. (R15, R4).

**Perception about the Cooperative Extension Service**

Ohio State University (OSU) Extension has initiated an urban producer networking group which facilitates social gatherings for urban producers, to meet up and network with others. The
respondents appreciated this because it gives them an opportunity to network with other producers in the city. As expressed by R2, this is a “fun and exciting event which facilitates learning through social activities.”

Another thing is urban farmers’ network. Out of this Extension business, he and other people get together and started get togethers that we could meet each other and socialize. It is wonderful. We had our first meeting a couple of weeks ago and it was a wonderful time. There were about 20 producers. It was fun and exciting. So, it is not just learning through Extension but also the social outlet. (R2)

Some respondents (R1, R3, R5, R6) also have had some negative experiences with Extension personnel which had made them reluctant to reach out to Extension in the future. R1 expressed that he could not receive the information he needed from Extension and Extension did not help him to reach out to other people who would had information for him. Moreover, R3 mentioned her disappointment towards their Extension agent for not disseminating new information he got from conferences and other related events he attended. Responsiveness of Extension towards respondents’ issues and information needs were also criticized by several respondents (R1, R3, R5, R6). R3 stated, that she received “vague responses to specific questions” she has asked from Extension.

I have needed quick information before and I have reached out to my Extension agent. And I have been told by him that he had no information for me. And even if I follow up they say they don’t have information. I assume that there is some network of Extension agents. So, I asked that if he could reach out and see if anybody else had information about that. But no follow up. That is not the only example that the same thing had happened. (R1)

It seems as though our Extension officer goes to all kinds of fancy conferences and things like that and I know this because I live in the academic world too right. So, I feel like he's very active in his academic side of everything but he's not really in touch with the reality of what people are going through or trying to respond to questions. I have definitely gotten a few vague responses from him to specific questions I have asked. I've had other people who've gotten just like “no I can't help you” and I just feel like there should be more responsiveness to the fact that people are -you're saying you want to be here for us so how do we work together to do that. (R 3)
During the interviews, several respondents complained that most of the Extension materials they receive are irrelevant to agriculture. (R1, R5, R12, R7).

I would say the e-newsletter I get which is the main thing that comes from Extension that I’ve seen from our office. It is actually pretty off putting because it does not include anything about agriculture. (R1)

A lot of what’s coming out from our Extension that has agriculture is monthly meetings or promoting events that other people are putting on that you are unaware of. (R5)

Respondents also stated their preference towards the information delivery modes used by Extension. Webinars are not preferred by respondents because they are difficult to get through and easy to avoid (R1, R5, R10). R5 said that the fixed slides used in webinars have not been very “attention getting and attention keeping” for her. Respondents preferred to receive information through e-mails (R2, R3, R4, R8, R9, R11, R14, R15), other electronic media such as Facebook posts (R1, R12, R5, R9), and searchable databases (R11, R13). R13 said that he preferred online materials more because he does not have to “drive half an hour to go sit somewhere to receive information.” R4 stated that he preferred “searchable interfaces” so that he could “learn what they need rather than being overwhelmed with too much information.”

Respondents also expressed their opinion on in-person training organized by OSU Extension. The respondents preferred to receive Extension information as on-farm demonstrations and in-person training because it is the best way to have a captive audience and to learn from a more experienced groups through interactive activities.

**Implications, Conclusions, and Recommendations**

Agricultural information acts as a determining factor for the success of agricultural farms and other related enterprises (Boehlje & King1998). Having an understanding about what, when, and how urban producers gather information is important to address their needs. As explored by
Taylor and Todd (1995) in their DTPB, an individual’s belief towards performing a behavior (perceived behavioral control) is influenced by the availability of information about that behavior. When an individual is confident about the availability of resources towards performing the behavior he/she is strongly influenced to perform that behavior (Ajzen, 1991).

Urban farming is a very information-intensive activity. As stated by the respondents themselves, most of them were first-generation urban farmers. Therefore, they do not have parental sources who can pass down basic knowledge about agriculture, which makes them highly dependent on other information sources. The respondents use a variety of information sources to gain agriculture-related knowledge. Those information sources are selected mainly by choice.

The respondents preferred to receive information from the Internet and other electronic media over conventional information sources. Diekmann, Bennaton, Schweiger, and Smith (2017) in a study conducted with urban producers in California reported similar findings, which highlighted the need for reliable online information sources for urban farmers. The respondents also prefer and trust close ties such as friends and co-workers from which to receive information. According to Granovetter (1973), new information flows more through weak ties than through strong ties because connections in the close network circle of an individual tend to move similar to that individual. Therefore, weak ties play an important role in allowing an individual to access new information. But, the findings of this study contradict with Diekmann and Batte (2009), who concluded that Ohio farmers prefer print and other traditional information sources over interpersonal and electronic media. But the authors had not considered rural-urban differences in their study. If the researchers had considered rural and urban farmers separately, the findings would have been more powerful in interpreting the preference of producers. The same study
stated that those who prefer the internet and other online sources tend to be educated and younger than other producers. This aligns with the findings of this study because most of the respondents were highly educated and were young in age. Llewellyn (2007) stated that information needs to be relevant, meaningful, and delivered in a way that is desired by producers. This highlights a need for change in Extension program delivery modes in urban areas. Extension needs to focus more on electronic and other visual media to disseminate information to urban producers. As suggested by Mastel (2014), adopting new technologies will help Extension to expand its audience. Extension is best suited to help beginning farmers because more advanced farmers who need specialized assistance are better able to pay for consultants. But, if OSU Extension is planning to address the needs of all farmers, the respondents’ perception of the fact that Extension is useful only for basic information could be overcome by designing and delivering programs to segmented audiences such as beginning farmers, established farmers, commercial farmers, community gardeners etc.

Visibility of Extension is a matter of concern in urban areas. Since Extension originated in the rural areas, targeting rural population, some urban respondents are still not aware of the services they can get from Extension, while some of them are completely unaware of the existence of Extension. Several research studies have stated that awareness, participation, and use of Extension resources is low among urban populations. (Jacob, Willtis, & Crider, 1991; Warner, Christenson, Dillman, & Salant, 1996). Bello and Obinne (2012) mentioned, when individuals feel the sources as credible, they tend to use those information sources.

The respondents’ trustworthiness towards Extension and university resources is high, but they are concerned about the time, mode of delivery, and availability of Extension information. Some respondents believed that Extension is useful only up to a certain point and thereafter
Extension cannot help with farming. Some respondents who are aware of Extension programs believed they could not benefit from Extension programs. This poses a challenge for Extension. It is recommended to conduct awareness programs among urban producers about the services available through Extension. Farmers’ markets could be a great avenue to spread the word about Extension, for those producers who are unaware of its existence. Since the respondents highly depend on co-workers and friends, producers who attend Extension programs could be advised to make other producers aware of Extension programs and resources available through Extension. Key leaders within the urban farming communities could be used to serve as opinion leaders to develop trust and to inform other producers of Extension services.

Other than quality, mode of delivery, relevance, and other factors that are related to information sources, it was also realized that personal characteristics of the information disseminator also plays an important role. Several producers interviewed for this study stated that they have had negative experiences with Extension professionals they interacted with. Those unpleasant experiences had made them dislike and become demotivated towards seeking out help from Extension. Raison (2010) and Reynolds (2011) suggested that the Extension agents taking on the traditional role of being an educator need to be combined with the role of a facilitator to effectively serve urban communities. Lelekacs et al. (2016) added more to it by suggesting “to provide educators with knowledge about food systems research, as well as tools, and guidance about working across disciplinary lines, facilitating community engagement, and addressing social dimensions of local food systems” (p. 2).

Today, available information and information sources are very diverse. Therefore, the need for quality information that is delivered on time, in the proper format is important to meet the needs of urban producers. Extension professionals are required to have a better understanding
urban producers’ information-seeking behavior. Future research on digital and online information delivery strategies and expected competencies from urban Extension professionals will assist Extension to design and deliver effective Extension programs to the urban clientele they serve.
CHAPTER 4
BARRIERS TO URBAN FOOD PRODUCTION: PERSPECTIVES OF URBAN FOOD PRODUCERS

Introduction

The need for a locally grown food system in urban areas has been identified due to numerous reasons. Agriculture has diversified into mechanized, industrialized, and large-scale practices with the extensive use of irrigation, chemicals, and fertilizer (Beus & Dunlop, 1990). Today, food systems have become more complex and challenging. 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 network of transportation 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 problems to the sustainability of the urban ecosystems (Horrigan, Lawrence, & Walker, 2002). Therefore, the need for a locally-grown food system has been highlighted especially in urban areas which can supply 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. The U.S. is also becoming increasingly urban. It is predicted that the number of people living in urban areas will increase (Urban Area Criteria for the 2010 Census, 2011; U.S. Census Bureau, 2010). From the year 2000 to 2010, there was an increase of population from 68.3% to 71.2% in urban areas in the U.S. and it is projected to grow more (Urban Area Criteria for the 2010 Census, 2011; U.S. Census Bureau, 2010).

“The combined elements of food production, processing, distribution, preparation, and consumption” is called a food system (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). Despite the increasing rate of population growth, 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 increasing number of people (Montgomery, 2008). With the increasing population, the demand for food increases, 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 really important to take actions to eliminate those barriers and to facilitate food production in urban areas.

**Literature Review**

Attitude towards a behavior has been identified as the strongest predictor of a behavior across different agricultural disciplines such as food consumption behavior (Spence & Townsend, 2006), environmental conservation behavior (Borges, Lansink, Ribeiro, & Lutke, 2014; Wu & Mweemba, 2010), and environmental activism (Kelly, 2008). Taylor and Todd (1995) in the Decomposed Theory of Planned Behavior (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.

Barriers to urban food production has been researched widely. 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 rules and regulations attached to it vary from city to city. In the above-mentioned studies, the researchers have 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 due to various reasons. Smit, Nasar, and Ratta (2001) identified proximity to densely populated areas as a barrier for urban food production due to contamination and 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 to install water lines and paying for water at retail rates. Several cities such as San Francisco, Cleveland, Milwaukee, and Madison have urban farmer-friendly policies that help urban producers access water at an adjustable usage rate (Hendrickson & Porth, 2012). Dallas and Dubuque are two urban cities where farmers collect water using rain barrels (Hendrickson & Porth, 2012).
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 for urban food production. Some cities such as Minneapolis, Baltimore, and Cleveland have taken different initiatives to address these problem 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 objection to urban agriculture is the 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 in the U.S. and many producers who are involved in urban food production are new to agriculture (Oberholtzer, Dimitri, and Pressman, 2014). Not only the food producers, but also Extension personal working in urban areas are relatively new to the concept of urban farming (Diekmann et al., 2016). In a national study conducted by Diekmann et al. (2016), 44% of the Extension personal have reported they had less than five years’ experience in urban areas. Therefore, 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 and 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. Basic qualitative research designs are used by researchers to explain “how people make sense of their lives and experiences” (Merriam, 1998, p. 23). Qualitative research aims at understanding the diversity and richness of a social phenomenon from human perspectives, in the natural settings of human participants (Ary, Jacobs, Sorensen, & Walker, 2014). 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. This formed the theoretical basis of this study.

Population and Sampling

The target population for this study was commercial urban food producers in Columbus, Ohio. Columbus was purposively selected for this study because Columbus is a national leader in urban Extension in the country and has branded their Extension service as OSU Extension.
Louton (2016) defined commercial producers as those who grow plants and/or keep animals, process them, and sell them in urban areas. 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. Purposive sampling which is often used in qualitative studies was used for this study (Barbour, 2007). Since the sample size is very small, and sampling method is not random, generalization cannot be done beyond the population (Ary et al., 2014). According to the discussion the researcher had with a key informant, there were fifteen active urban food producers in Columbus. Purposive sampling was used to identify those producers.

Since there could be other commercial producers in Columbus, Ohio, without the knowledge of the key informant, snowball sampling was also used to identify additional producers. According to Patton (2002) snowball sampling is a purposive technique that uses the help of potential participants to identify other participants. Sample size was determined by the extent of data saturation (Merriam, 1998). The initial commercial urban producers identified though purposive sampling were asked to nominate additional commercial producers. Based on this process fifteen commercial urban food producers were identified and interviewed for the study.

Ten of the fifteen producers interviewed for this study were female and the other five were male. The respondents have 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 have a 4-year college degree. About 15% of the respondents have completed college education and about 16% have a graduate or a professional degree. The other 15% of the respondents have completed high school or GED. When the respondents were asked to mention
their gross annual income from urban farming about 70% of the respondents’ annual income was below $10,000. 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. The conceptual framework guided the design of the interview guide. 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 such as 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 and they were asked to review the transcriptions for accuracy. According to the feedback from the respondents needed changes were done to the interview transcriptions to ensure that they capture true
thoughts of the respondents. 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 checked with the audio to ensure accuracy.

**Data Collection and Data Analysis**

Semi-structured interviews were conducted with each respondent in January of 2017. Semi-structured interviews allowed the researcher to collect more relevant information that was not included in the interview guide (Creswell, 2013). Interviews lasted an average of 20 – 30 minutes with each respondent. 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 premises 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 and 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 OSU. Therefore, the opinions of respondents concerning the CES could also be a potential source of bias.

**Results and 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. The next section of the article presents barrier for urban food production as perceived by the respondents interviewed for this study.

**Barriers Associated with Legal Factors**

Legal factors were considered as the most important barrier for urban food production in Columbus. Almost all the respondents considered legal factors as their number one barrier for urban farming. Those 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 that the city ordinances of Columbus have restricted practicing commercial agriculture in lands which are less than five acres, selling agricultural produce on a residential lot, and keeping chicken and other livestock animals on a residential lot.
Most of the respondents interviewed for the study are small scale and their land area is less than five acres. As mentioned by the respondents, 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.” R4 stated that he felt like “the city is trying to price us out for doing agriculture.”

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. (R 2)

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 identified through this study. 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.

Not only are zoning requirements challenging, adhering to some of the HOA guidelines is another challenge for the respondents. Bylaws from HOA has made it difficult for some producers to practice agriculture in the city. Several respondents mentioned they are afraid to put a sign up because if they put one up, the HOA will 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 of the urban producers.

**Barriers Associated with Cultural Factors**

Barriers associated with urban culture were identified as another challenge for urban food production. Cultural factors included acceptance for urban producers in the 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 interviewed for the study publicized that they did not feel being accepted in their community (R1, R3, R5, R8, R10, R12, R13). This 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. 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. (R 3)

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).

Food habits of urban consumers 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. (R 7)
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 declined 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 most of the community gardens, 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 at the farmers’ market, to restaurants, and do CSA (Community Supported Agriculture). Since non-profit farms are well-known for having a “social mission,” respondents feel as though non-profit farms are better perceived by urban consumers. According to respondents, while practicing agriculture is perceived negatively in urban culture, non-profit urban farms are seen in a better way because of their social mission. Not only consumers feel this way, the respondents also 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 the 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. (R 14)

Not having enough 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 over other venues 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. This is a challenge. 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. Not having enough land for agriculture has
become a challenge for the respondents to meet the demand of consumers. But depending on the price and fertility of the land in urban areas, acquiring more land has become a challenge. 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)

Not only quantity of land, but also the quality of land is a challenge. Most producers interviewed for this study identified poor quality of soil as a barrier to continuing production. As stated by the respondents, they are unable to do ground production because of the fertility of the soil. Therefore, they would have to import soil and do above the ground production which is a challenge. Availability of water is another problem associated with urban food production. 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 the market factors, the respondents complained that most of the funding opportunities and grants are skewed towards nonprofit urban farms because of the social missions attached to them. Not only that, some respondents commented that Extension and other organizations also prefer to disseminate information more towards nonprofit because of the same reason. Therefore, not having enough grants and funding opportunities is a challenge for the respondents.

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 farmers. (R1)

Conclusions, Implications, and Recommendations

According to the DTPB, complexity has a direct relationship with attitude (Taylor & Todd, 1995). The more an individual perceives adopting a given behavior as being difficult, the more negative that individual’s attitude towards it (Rogers, 1983). According to the conceptual model developed for this study, perceived complexity is considered to negatively influence urban producers’ attitude on urban food production. 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.

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 it was realized that 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. But the respondents play an important role in the food system of the city because they address the food requirements of consumers who prefer fresh, locally produced food which is delivered to their door or which could be purchased at the farmers’ market.

Agriculture is a location based activity. Operation of agriculture is influenced by state and local regulations. Zoning ordinances are the most critical barrier for urban food production in Columbus. Columbus has very specific zoning ordinances to determine if agriculture is permitted and where agriculture can be practiced. The legal code of Columbus (Ordinance 1877, Rule 3332.040) related to agriculture says,

An agricultural use, farm, field crops, garden, greenhouse, nursery, and a truck garden may be conducted in any residential district contained in this chapter
without restriction as to the operation of incidental vehicles and machinery or restriction as to the incidental sale and marketing of products raised on the premises, provided that:

1. The agricultural use is located on-premises and on a minimum lot area of five acres; and
2. A poultry and livestock building, structure and yard is located on-premises and is located a minimum distance of 100 feet from a lot or street line; and
3. Poultry and livestock for sale are kept in approved enclosures.

According to this legal code, 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 on which they grow fruits and vegetables, and keep livestock. Due to that reason, many respondents considered their business illegal in terms of city ordinances. Several other cities in the country such as Portland and Los Angeles also have had similar zoning ordinances, but they were changed to be more favorable to urban agriculture (Mukherji & Morales, 2010). As stated by Mukherji and Morales (2010), creating friendly zoning processes are vital to foster urban agriculture in cities. Therefore, attention needs to be given to revising city ordinances which would help the respondents to adopt them. The Ohio State University Extension (OSU Extension) in Franklin county can educate the city and recommend the need for action for a policy change. Bartling (2012) in his study stated that advocates need to come up with strong arguments related to health, education, and nutrition requirements in order to suggest changes for city ordinance. Because, opponents for restrictive ordinances always articulate facts about health effects of farm animals raised in residential areas. Even though the existing ordinance is not completely against urban agriculture, purchasing lands more than five acres is not feasible for many producers because of the cost of land in the city. Therefore, revising city ordinances and advocating for that need should be done by balancing both parties; the residents and urban producers. The Local Food Action Plan of Columbus, Ohio also suggested revising city
ordinances as a strategy to encourage agriculture within the city (Local Food Action Plan Team, 2016). Moreover, the respondents should also take into consideration the area in which they are trying to farm. If they live in a zone resident and HOA, they knowingly have agreed to the rules of the HOA and zoning ordinances when they purchased the home. Therefore, producers who do not want to be bound by those rules are advised to look for better farming opportunities elsewhere.

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 consist of numerous government, county, regional, and other private agencies (Gaolach, Kern, & Sanders, 2017). Therefore, the respondents must contact several agencies and departments to get information relevant to land use for agriculture as rules vary between agencies and jurisdictions. If the city can come up with a department or a committee 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, the city can 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.

Urban areas are highly diverse socially, culturally, economically, and environmentally compared to rural areas. Therefore, to address issues in urban areas, a sound understanding about the complex urban environment is needed (Gaolach, Kern, & Sanders, 2017). Unlike rural areas, agriculture is not considered a part of urban life. As mentioned by the respondents, urban
residents negatively perceive agriculture. People may dislike agriculture because they are unaware of it and scared of potential negative effects on them such as water contamination, health effects, and impact on land values (Kim et al., 2014). Therefore, negative perception towards urban farming can 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.

The Cooperative Extension Service (CES) together with other responsible authorities can design awareness campaigns to promote urban agriculture and make residents aware of the importance of urban agriculture. The respondents, who have negative relationships with their neighbors tend to have more issues compared to those who have friendly relationships with their neighbors. Therefore, it is recommended that respondents try to build good relationships with their neighbors by talking with them and making them aware of the environmental friendly practices they follow. Extension, social organizations such as religious institutions, and key personnel in urban areas can moderate both parties to foster relationships. Moreover, 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 when there is a conflict between them. Moreover, the respondents should also take into consideration the area in which they are trying to farm. If they live in a HOA, they knowingly have agreed to the rules of the HOA when they purchased the home. Therefore, producers who do not want to be bound by those rules are advised to look for better farming opportunities elsewhere.

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. The city of Columbus should create more market options for urban food producers. The CES can help the city to identify barriers to entering into new markets.

In order to overcome limitations for resources such as land, the city can develop a strategy to facilitate urban producers in purchasing city-owned land and leasing lands from private owners. Small grants and low-interest loans could be offered to commercial urban producers to motivate them more towards agriculture production. Cities like Cleveland, Baltimore, and Detroit have identified urban agriculture as a land re-use strategy and have created new plans to use vacant lands (LaCroix, 2010). These cities can serve as an exemplary model for Columbus, to improve its urban food production system. Developing partnerships with other institutions that have a similar mission of serving the urban community is mutually helpful for extension and other parties in times of resource shrink. Lubell and Fulton, (2008) recommended developing partnerships with other institutions as a strategy to develop social capital in urban areas. Therefore, programs, networks, organizations, and responsible people directed towards urban farming would help to eliminate barriers to urban food production.
CHAPTER 5
UNDERSTANDING URBAN FOOD PRODUCERS INTENTION TO CONTINUE FARMING IN URBAN SETTINGS

Introduction

Agriculture occurring in urban areas can be called urban food production and comprises of one component of local food systems. The Urban Agriculture Committee of the Community Food Security Coalition (2002) defined urban food production as “the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities” (p. 4). Even though it is manifested as vegetable and fruit production in many cases, it varies widely (Viljoen, 2005). Since urban areas provide better opportunities for agricultural activities such as marketing produce, demand for food, and accessibility to resources, food production in urban areas has been identified as an important component of urban sustainability (Alberti, Marzluff, Shulenberger, & Bradley, 2003; van Veenhuizen & Danso, 2007).

In 1996, metropolitan counties contributed to 30% agricultural produce in the country (Smit, Ratta, & Nasr, 1996). As reported by Heimlich and Anderson (2011), “in 1997, urban agriculture made up a third of all farms and contributed 39 percent of farm assets. Eighteen percent of farmland operated was located in metro areas in 1997” (p. 38).

The demand and recognition for urban food production is increasing globally as a sustainable development strategy in cities (van Veenhuizen, 2006). When the food is produced within the city, the cost for transportation, processing, and packaging also decreases (Mendes, 2006; Mougeot, 2006). Building community and social capital, maintaining self-sufficiency, and creating local resilience are other advantages of urban food production (Brown & Jameton, 2000; van Veenhuizen, 2006). Because of these positive aspects, urban agriculture has been identified
as one of the most important priorities for many cities in the nation (CRD Roundtable on the Environment, 2006; Mendes, 2006; Mullinix et al., 2009).

Some prominent characteristics of urban food production are space limitation, proximity to markets, the minimum degree of farmer organizations, high specialization, production of perishables, limited space, and high competition for land (van Veenhuizen, 2006). Producing food has been a part of the lives of people living in urban areas as a livelihood (Mougeot, 2006; van Veenhuizen, 2006). Not only nationally, but also internationally efforts have been made to improve food production in urban areas (van Veenhuizen, 2006). Greening urban cities, utilizing organic waste, reducing pollution, minimizing heat, and improving air quality are some of the advantages of urban food production. It also helps to contribute to building community and social capital, which in turn creates self-sufficiency and social resilience (Brown & Jameton, 2000). For these reasons, the attention given to urban vegetation and urban gardening has increased as they contribute to improving the quality of urban life by offering opportunities for income generation, mental relaxation, social integration, and physical exercise (Lee & Maheshwaran, 2011).

As explained by the Urban Agricultural Committee of the Community Food Security Coalition (2002), “urban farmers are practical, high-energy individuals willing to take advantage of the significantly higher margin the urban farmer can sell to retail, over against the rural farmer” (p. 3). Urban producers can be broadly categorized into three main areas according to their location and practices: backyard gardeners, community gardeners, and commercial growers (Urban Agricultural Committee of the Community Food Security Coalition, 2002). Just like the urban population itself, urban producers are also very diverse. Women, immigrants, and minority
populations play a significant role in urban agriculture in the U.S. (Urban Agricultural Committee of the Community Food Security Coalition, 2002).

Because of the economic, social, environmental, and health benefits attached to it, attention has been given to improving urban food systems as a strategy to address complex urban issues (Daftary-Steel, Herrera, & Potter, 2015; Pothukuchi & Kaufman, 1999). As a result, there is an increase in the number of farmers’ markets, community gardens, and urban farms in the U.S. (Low et al., 2015; National Gardening Association, 2014; Rogus & Dimitri, 2015). In this context, identifying factors that lead to behavioral intention of urban producers to continue farming in urban settings is very important.

**Literature Review**

The Decomposed Theory of Planned Behavior (DTPB) which is an extension of the Theory of Planned Behavior (TPB) is a widely-used theory in different disciplines to understand behavioral intention of individuals. Intention; which is the center of the TPB includes “the motivational factors that influence a behavior” (Ajzen, 1991, p. 181). Ajzen and Fishbein (1980) in their TPB suggested that intention to perform a behavior is influenced by attitudes, subjective norms, and control beliefs. Taylor and Todd (1995) in their DTPB, highlighted the importance of understanding specific factors that influence attitude, subjective norms, and perceived behavioral control in order to have more power of predictability. Therefore, by understanding these three determinants, one can predict an individual’s intention to perform a behavior.

**Attitude towards Behavioral Intention**

Attitude is a strong predictor of behavioral intention (Taylor & Todd, 1995). Several studies have been conducted in different areas of agriculture to understand an individual’s behavioral intention and the factors that influence it. Some examples of those studies related to agriculture included genetically modified food consumption behavior (Spence & Townsend,
small scale farmers’ environmental conservation behavior (Wu & Mweemba, 2010), small-scale farmers’ participation in tree planting programs (Maijer, Catacutan, Silesi, & Nieuwenhuis, 2015), and an individual’s environmental activism (Kelly, 2008). According to the findings of those studies, attitude has a direct influence towards behavioral intention. When an individual has a positive attitude towards a behavior, he is more likely to engage in it (Rogers, 1983).

Relative advantage, complexity, and compatibility all have a direct influence on attitude towards performing a behavior (Taylor & Todd, 1995). Several research studies have proven when an individual is aware of the relative advantages of performing a behavior he/she is more likely to perform that behavior (Maijer et al., 2015; King & Rollins, 1995; Germain, Ellis & Stehman, 2014). Accessibility, ease of use, availability, cost, and financial benefits of performing a behavior are some examples of relative advantages associated with a given behavior (Maijer et al., 2015; King & Rollins, 1995; Germain et al., 2014; Moore, Murphy, Degenhart, Vestal, & Loux, 2012).

Complexity is another determinant of attitude towards performing a behavior (Taylor & Todd, 1995). Complexity is the degree of difficulty to operate, understand, or learn (Rogers, 1983). Complexity has a negative relationship with attitude. When the complexity of performing a behavior is high, individuals are reluctant to perform that behavior.

Compatibility, which is a strong determinant of attitude has a significant influence towards behavioral intention (Taylor & Todd, 1995). Compatibility refers to the degree of fit with existing values, previous experiences and needs of urban producers (Rogers, 1983). According to Tornatzkey and Klein (1982), when an innovation is compatible with the value system of an individual, it is more likely to be adopted. Similar results about the relationship
between compatibility and intention were reported in studies conducted about farmers’ adoption of nitrogen testing programs (King & Rollins, 1995) and Extension Master Gardener record keeping system (Dorn, 2016).

**Subjective Norms towards Behavioral Intention**

Intention to perform a behavior is directly and indirectly influenced by subjective norms (Fishbein & Ajzen, 1995). Perceived expectations of people who play important roles in the life decisions of an individual are captured under the subjective norms. The approval or disapproval of those important people around the individual regarding the specific behavior of the individual determine the subjective norm towards the behavior. If the individual thinks that the people around him/her approve a specific behavior, then the individual will have positive subjective norms towards the intended behavior and have greater intent than if subjective norms were weak (Fishbein & Ajzen, 1975). The influence from the important people in an individual’s life was named as referent influence in the DTPB by Taylor and Todd (1995). The reverse will happen if the individual believes that the people around him/her will disapprove of his/her behavior by having negative subjective norms towards the behavior (Ajzen, 1991). The influence of subjective norms for behavioral intention has been reported in some agriculture related studies such as cattle farmers’ natural grassland conservation behavior (Borges, Lansink, Ribeiro, & Lutke, 2014) and individuals’ intention to install rain gardens (Shaw, Radler, Chenoweth, Heiberger, & Dearlove, 2011).

There is a direct relationship between perceived behavioral control and subjective norms (Ajzen, 1991). As mentioned in the previous paragraph, people who are very trustworthy to an individual can influence on their subjective norms (Ajzen, 2002). Examples for those trusted individuals (referents) are family members and opinion leaders (Ajzen, 2002). If the person is closer to the individual, he/she can have a great influence on that individual’s subjective norm.
Therefore, an individual is more likely to engage in a behavior that is encouraged by the people who the individual interacts with more frequently (Ajzen, 2002).

**Perceived Behavioral Control towards Behavioral Intention**

Perceived difficulty or ease towards a behavior is described by perceived behavioral control. Perceived behavioral control acts as a very strong determinant of behavioral intention (Ajzen 1989). Some examples for agriculture related research studies that explored the positive relationship between perceived behavioral control and behavioral intention were undergraduate students’ preference to adopt low-fat diets (Armitage & Conner, 2001), Florida Strawberry farmers’ water conservation adoption behavior (Lynne et al., 1995), and food consumption behavior of individuals (Sparks, Guthrie, & Shepherd, 1997).

Perceived behavioral control is influenced by several factors such as perceived advantages, challenges, and barriers (Rehman et al., 2007), personal, and situational factors (Tanner & Kast, 2003), and availability of resources (Taylor & Todd, 1995). Economic benefits are an example of a factor that has a positive influence on behavioral intention while technical literacy has a negative influence on behavioral intention (Rehman et al., 2007). Examples of situational factors that influence behavioral intention are availability, time of purchase, and labelling (Sparks, Guthrie, & Shepherd, 1997). Personality traits are a good example of personal factors that could influence behavioral intention (Tanner & Kast, 2003). Personality traits related to food consumption behavior included health beliefs of the individual, nutrition beliefs, convenience, money considerations, pickiness, and so on (Furst et al., 1996). When an individual is confident about the availability of resources needed to performing a behavior he/she is strongly influenced to perform that behavior (Ajzen, 1991). For example, when urban producers perceive that they possess financial aids that decreased the perceived difficulty of engaging in urban food production, they are more like to engage in that behavior. If the urban producers
believe there would be elements that prevented the availability of financial aids, then they are less likely to perform the behavior

**Purpose and Objectives**

The purpose of this study was to describe the intention of urban food producers to continue producing food in urban settings. The specific objectives that guided the study were (a) to describe factors that influence attitude towards urban food production, (b) to describe the factors that influence perceived behavioral control towards urban food production, and (c) to describe factors that influence subjective norms towards urban food production.

**Methodology**

This study followed a qualitative approach. In qualitative research, it is believed that the world is not stable or uniform. Therefore, there could be multiple realities out there, none of which is more accurate or valid than the other (Ary, Jacobs, Sorensen, & Walker, 2014). Qualitative research is about creating that reality through the interaction with the environment and through researcher’s lived experiences (Creswell, 2013).

Theoretical perspective used for this study is constructionism. Social constructionism is applied to studies that talk about the socially constructed nature of social life. Vygotsky (1978) stated that interactions create the reality of a person. This study is designed to understand the perspectives and perceptions of urban producers regarding their intention to continue producing food in urban areas. All processes related to this study, including attitude: subjective norms, and control beliefs for food production in urban areas are influenced by social interactions; form the theoretical basis of this study.

This study was conducted as a basic qualitative design of urban commercial farmers in Columbus, Ohio. Columbus is the capital of Ohio, which records the largest population of the state with 17% of the total population of the state living in the Columbus metropolitan area.
According to National Urban Extension Leaders (n. d), Columbus is national leader in urban Extension. Therefore, Columbus was purposively selected for this study.

**Instrumentation**

No similar instrument was found on the given topic, because available literature on urban food production and urban food producers is very limited. Therefore, the researcher developed an interview guide through a process which included literature review, feedback from a panel of experts, and approval from the institutional review board of University of Florida. The interview guide included open ended questions about perspectives of urban food producers regarding food production in urban areas. Demographic data such as gender, age, level of education, number of years lived in an urban area, type of produce, and type of market were also collected.

**Population and Sampling**

Population for the study were commercial urban food producers in Columbus, Ohio. Urban agriculture is defined as the “growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities” (Bailkey & Nasr, 2000, p. 3). The operational definition for urban commercial growers considered for this study was people who grow, process, and sell plants and/or raise animals in the city.

According to a key informant; the Extension specialist attached to the CES in Columbus Ohio, there were fifteen active urban food producers in Columbus. Purposive sampling which is often used in qualitative studies (Merriam, 1998) was used to identify these fifteen urban commercial food producers, to meet the objective of this study (Barbour, 2007). In purposive sampling, generalization cannot be done beyond the population, because the sampling method is not random (Ary et al., 2014).

The researcher believed that there may have been other commercial urban food producers engaged in urban food production in addition to the fifteen identified by the Extension specialist.
Therefore, snowball sampling was used to identify additional respondents. Snowball sampling is a purposive technique that uses the help of potential participants to identify other participants (Patton, 2002; Taylor-Powell, 1998). Sample size was determined by the extent of data saturation (Merriam, 1998). Altogether fifteen urban commercial food producers were identified (8 from the original list from the key informant and 7 from snowball sampling). In qualitative research, several factors such as the purpose of the research, the type of data collected, and the available resources determine the size of the sample (Merriam, 1998). Therefore, there is no specific number for sample size in qualitative research (Ary et al., 2014). Interviews and participant observations were done to collect data.

Ten of the fifteen producers interviewed for this study were female and 5 were male. The average number of years’ respondents have lived in an urban area was 15. About 54% of the respondents had completed a 4-year college degree followed by 15%, 16%, and 15% of the respondents who had completed some college education, graduate or professional degree, high school, or GED respectively. About 70% of the respondents’ net annual income from farming was below $10,000. Respondents’ average years of experience as urban farmers was 6 years.

Table 4-1 provides a summary of each of the respondents interviewed for this study.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Gender</th>
<th>Years of urban farming in Columbus</th>
<th>Farm Production in Acres</th>
<th>Type of produce</th>
<th>Marketing strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Female</td>
<td>6.0</td>
<td>.3</td>
<td>Vegetables</td>
<td>Wholesale</td>
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<td></td>
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<td></td>
<td></td>
<td>Fruits</td>
<td>Farmers’ market</td>
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<td></td>
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<td></td>
<td></td>
<td>Herbs</td>
<td>Restaurants</td>
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<td></td>
<td>Forage</td>
<td></td>
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<tr>
<td>Respondent</td>
<td>Gender</td>
<td>Years of urban farming in Columbus</td>
<td>Farm Production in Acres</td>
<td>Type of produce</td>
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<td>2</td>
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<td>On-farm sales Community Supported Agriculture (CSA)</td>
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<td>Vegetables, Fruits</td>
<td>Wholesale Restaurants CSA</td>
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<td>8.0</td>
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<td>Wholesale Farmers market Restaurants</td>
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<tr>
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<td>2.0</td>
<td>Vegetables, Fruits, Livestock, Fish, Honey</td>
<td>Farmers’ market On-farm sales CSA</td>
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<tr>
<td>7</td>
<td>Male</td>
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<td>5.0</td>
<td>Vegetables, Fruits</td>
<td>Farmers’ market Restaurants CSA</td>
</tr>
<tr>
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<td>0.1</td>
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<td>On-farm sales</td>
</tr>
<tr>
<td>9</td>
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<td>5.0</td>
<td>Vegetables, Flowers</td>
<td>Wholesale Farmers’ market On farm sales</td>
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<td>10.0</td>
<td>Cut flowers</td>
<td>Wholesale Farmers market On farm sales</td>
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</tbody>
</table>
Table 4-1, Continued

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Gender</th>
<th>Years of urban farming in Columbus</th>
<th>Farm Production in Acres</th>
<th>Type of produce</th>
<th>Marketing strategy</th>
</tr>
</thead>
<tbody>
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<td>12</td>
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<td>Farmers’ market, Restaurants, Wholesale</td>
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<td>Vegetables, Fruits</td>
<td>On farm sales</td>
</tr>
<tr>
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<td>6.0</td>
<td>Vegetables, Fruits</td>
<td>Farmers’ market, Restaurants, On farm sales</td>
</tr>
<tr>
<td>15</td>
<td>Male</td>
<td>1.5</td>
<td>7.0</td>
<td>Vegetables</td>
<td>On farm sales, Restaurants</td>
</tr>
</tbody>
</table>

Subjectivity and Bias

The researcher is an important element of a qualitative research (Merriam, 1998). Participants’ viewpoints can be influenced by the personal preferences, interpretations, and experiences of the researcher. This research was conducted by an international student with minimum to no experience in the urban food production sector, so the potential biases presented with the research are different. But, the researcher believed strengthening local food systems and urban Extension programs were likely solutions to problems in urban areas which could be a potential bias. The researcher contacted urban food producers through the Extension specialist from OSU. Therefore, the opinions of respondents concerning the CES are identified as a potential source of bias.

Data Collection and Data Analysis

Data collection was done in January of 2017. Semi-structured interviews were conducted with each respondent to collect data. According to Creswell (2013), semi-structured interviews
are helpful for participants to add more information that is relevant to the context, but is not included in the interview guide. Moreover, semi-structured interviews are also helpful to explore concepts that are connected to the main topic. Interviews lasted 20-30 minutes with each respondent. The interviews were audio recorded with the permission of the respondents. Researcher notes were also taken to supplement the recordings. Informed consent was obtained from respondents to take part in the interviews. First the purpose of the study was explained to the respondents and casual conversations were had with respondents to build rapport with them (Creswell, 2013). Participant observations were done by visiting urban farms and shadowing urban producers to learn about them and their work. This allowed the researcher to learn about urban producers’ farm operations and activities in their natural settings (Creswell, 2013).

Data were analyzed based on the conceptual model developed for the study. According to the conceptual model, factors that influence attitude, perceived behavioral control, and subjective norms were identified and analyzed. The data were transcribed first. To identify categories, line-by-line open coding were used as explained by Strauss and Corbin (1990).

Trustworthiness was used to measure validity of this qualitative study. To measure the validity of a qualitative study and to establish rigor, Lincoln and Guba (1985) introduced the term trustworthiness. Credibility, dependability, confirmability, and transferability were used to measure trustworthiness as suggested by Lincoln and Guba (1985). Credibility was established through member checking and triangulation. Audio records and notes taken by the researcher were used to triangulate data. Member checking was done by getting the feedback from the respondents for the interview transcriptions. First, the voice records of the interviews were transcribed. Then the transcriptions were sent to the respective respondents for their feedback to confirm whether the transcriptions reflected the true opinions of the respondents. According to
the feedback received from the respondents, necessary changes were done to the transcriptions to ensure accuracy. 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). Throughout this study the researcher maintained a journal to take notes of each visit to individual producers. Audio records of each interview were listened multiple times for understanding. Transcriptions of the interviews were checked with the audio to ensure accuracy. All the reflective processes, notes, and data analysis used in this study were documented.

Results

Factors that lead to intention to continue farming in urban areas were categorized under attitudes, subjective norms, and perceived behavioral control to better predict the behavioral intention. Factors that influenced attitude included relative advantage, complexity, and compatibility. Referent influence was identified as a factor that influence subjective norms. Information and other resource availability and personal characteristics of respondents were considered as factors that influence perceived behavioral control.

Attitude towards Intention to Continue Farming in Urban Areas

Attitude to continue farming in urban areas was influenced by several factors. Those factors were broadly categorized under relative advantage, complexity, and compatibility.

Relative advantages of urban food production

Market, land price, and close to off farm income were some of the relative advantages mentioned by respondents. Market advantages included getting a good price and having enough market opportunities to sell. Respondents stated that they could sell their produce for a higher
price compared to rural areas, which is one of the biggest advantages for them. R7 went on to say “if I had a farm stand in the country and I was trying to sell a bag of lettuce for five bucks well they would just laugh and drive away. So, I think that the prices can be higher here in the city.”

According to the discussions had with the respondents, it was realized that urban consumers are willing to pay a little bit more to support their local producers, and to keep the money within the local economy. R5 mentioned that “getting produce to places that are extremely fresh instead of having to sit on it for a while until you're going to take all these loads into town” is another advantage of producing food within the city.

Proximity to markets was another advantage of urban farming. Several producers interviewed for the study mentioned that there are producers from rural areas who drive more than one hour to get into the city to sell their produce. R11 stated that she does not have to worry about distribution at all because her customers “can stop by on their way to or from work to buy her produce which is very cost and time effective for both parties.” Moreover, R9 stated that being located in the city gives her more time to interact with the customers than rural producers, because urban producers can save their transportation time. Some urban producers also make this an opportunity to invite people to volunteer in their farms which is mutually beneficial for both parties in terms of labor and experience. Therefore, being close to markets and having no burden of transportation were reported as relative advantages of urban food production.

The opportunity to market and sell diverse and value-added products is another advantage. Urban food markets have a good demand for value added produce. R11 mentioned that he grows Tulsi and artichokes on his farm which he sells at a higher price, because nobody else in the city is selling them. R1, R5, and R6 talked about the market opportunities they have to
sell value-added tea and herbs. R11 further explained that “if you have quality products you can usually command a premium if you have a market that can support that.”

**Complexity of urban food production**

Complexity of urban food production includes challenges and barriers associated with urban food production. These challenges and barriers included factors that restrict, hinder, and demotivate producers from engaging in food production and continuing to farm in urban settings. As stated by the respondents, rules and regulations imposed by city zoning are the greatest barrier for urban food production in the city of Columbus. Other than that, respondents also considered bylaws of Homeowners Associations (HOA) as a barrier.

Because of zoning it makes me hesitant to invest money into the business, knowing that I could be lost at any point and someone win. Yes, that would be the biggest thing. That would be the biggest barrier for growth (R 1).

Cultural barriers included acceptance and negative perception for urban food production, food habits of urban consumers, and preference for non-profit agricultural farms. Several producers expressed their frustration for not being accepted in their communities as farmers.

Moreover, the respondents also identified food habits of urban consumers as a barrier. Because of the busy lifestyles of urban residents, many people living in urban areas prefer to be eating out and are not used to cooking their own food. This has become a challenge for local food markets to sell fresh produce.

Another barrier and challenge would definitely be has that the public’s big picture shifted away from cooking with raw ingredients (R3)

Market challenges included competition and not having enough market options. Having to compete with non-profit urban farms is the biggest market related challenge for urban food producers. Because of the social mission attached to non-profit urban farms, many consumers prefer to buy produce from them. Funds, labor, information, and other resources are more
skewed towards non-profit urban farms because of the social mission attached to it. R1 stated that “the story about the non-profit side is shared and it seems it’s like a really successful business.” The consumers also prefer to buy produce from non-profit farms because of the social mission attached to it. R8 stated that for-profit producers have to “pay for all their stuff themselves while non-profit producers are getting money from grants.”

I don’t know any urban farm that hires labor. We can’t really afford labor generally like non-profit farms because they have a social mission. They get a lot of free labor. So it’s tough to compete with them (R14)

Factors that limit continuing food production in urban areas also included limitation of resources such as land, water, quality of the soil, and funds. The respondents interviewed for this study complained about the struggle they have to undergo to get a continuous water supply for their plants by installing pipelines and the amount of money they have to pay for importing soil because of the poor-quality soil they have on their lands.

**Compatibility of urban food production**

Compatibility refers to the degree of fit with existing values, previous experiences and needs of urban producers (Taylor & Todd, 1995). According to Tornatzkey and Klein (1982), when an innovation is compatible with the value system of an individual, it is more likely to be adopted. Therefore, it is expected that the more one is engaged in urban farming, the more urban producers perceive it to be compatible with their lifestyle.

Social motives and social missions of respondents has a direct influence on their attitudes towards urban farming. R2 explained how “seeing children are hungry” and “seeing school children’s’ lunch” became a “part of her consciousness” and motivated her to grow food. Moreover, she also expressed her “hate” towards the “collapses in the food system” which motivated her to “grow her own food and be a part of the local food movement and bring back the ability to be self-sufficient.” She expressed that “growing food is the only way that the
paradigm will shift where we go back to when everybody has something grown for themselves in their backyard.” R15 who has lived behind a super market expressed the frustration and sadness he felt when he “watched families get their daily food out of the dumpster.” It made him realize the “need for food in his close community” which was his initial motivation for becoming an urban food producer.

I guess another part that hurts me is to see that children are hungry, no matter where they are, whether they are American children or children somewhere else. That bothers me a great deal. When I think about children who are hungry here that bothers me more, because that’s close to home. Not only children who are hungry, but also children who are eating poor nutritional things, and that means that they are not healthy and they won’t meet the potential of their lives. So, when you talk about the emotional part of it, that upsets me. So, when you think about the larger world, that’s the impact that you can make when you start to grow your own food. Because the children will be healthier and they won’t be hungry and they won’t have to rely on the cooperate food and school lunch. I have seen my neighbor children who have never seen where their food is grown and where they are coming from. I see this is a potential for teaching garden. (R2)

Social factors also included the help and support respondents received from organizations. Those organizations included the Cooperative Extension Service and other agriculture related organizations in the city. Most of the respondents interviewed for this study had not have any background in agriculture. R3, R2, and R5 appreciated the knowledge they received from the Master Urban Gardener Program offered by Ohio State University Extension (OSU Extension). R1 and R5 explained the education, training, and networking opportunities they received from OSU Extension and the Ohio Ecological Food and Farm Association which helped them to continue their business as urban food producers.

The influence of media and communication materials were also identified as important factors in motivating respondents to become urban produces. R1, who is fond of reading books said that she was mainly inspired by the agriculture related books and Extension materials she received from different universities. R15 talked about the influence he got from TED talks and
books he read about urban farming in different countries and other states in the country.

Moreover, he explained how those videos “got him off his couch.” R8 specifically mentioned her “religious background” as her “biggest push” for growing food. “It teaches a lot about preparedness and self-sufficiency and how we need to have a food storage. So, if something happens like a loss of job or a natural disaster, or some catastrophe, so there is something to it.”

Subjective Norms towards Intention to Continue Farming in Urban Areas

Perceived expectations of people who play important roles in the decisions of an individual are captured under subjective norms (Ajzen, 1991). Taylor and Todd (1995) identified referent influence as a strong determinant of subjective norms. Several producers mentioned how gardening with their family as kids influenced them to become an urban producer. R1 stated how gardening practices she learned from gardening with her family helped her to make the decision to become an urban producer. R3 expressed how her mother in-law who “knew the land and seasons” helped her figure out which crop to grow during each growing term. R14’s life-partner who was an agro-forestry major has helped her to make decisions about “perennial systems, trees, and intermixing annuals and perennials” with his knowledge.

Not only close-ties such as family members, but also other urban producers have also influenced and motivated respondents to become urban producers. Some of those urban producers have been unknown to the respondents, while some of them were known. Most of the commercial urban producers appreciate the motivation they received from “Farm SW” which was the first commercial urban farm in Columbus.

Smith had a tour at his place and… he had a garden tour at his place and I went there and he was making a living doing it and on a very, very small spot. So, he was kind of my inspiration to try. (R 11)

R3, R1, and R14 identified their business partners as the most influential people for their business, because their business partners have more knowledge and experiences relevant to
farming. R1 stated there was a random person who she met through another event who offered her land to cultivate which was a great influential factor for her to start farming. R3 added, she “kept looking over the fence from our yard into our neighbor’s yard who was an elderly woman” who was the initial motivation for her to start practicing agriculture.

I had one mentor in my first year. He was a third-generation organic farmer. He would give me helpful advice. I have a friend who became a vegetable farmer. And he was the one who provided me space during my first year for poultry beds. He was fairly influential for that operation. (R 13)

Influence of Perceived Behavioral Control towards Intention to Continue Farming in Urban Areas

Individual perception towards the barriers and facilitators (control belief) for performing a behavior provided the foundation for perceived behavioral control (Ajzen, 1991). Perceived behavioral control directly and indirectly influences behavior. Taylor and Todd (1995) in their DTPB described personal characteristics and resource availability as factors that determine perceived behavioral control.

Influence of personal characteristics towards perceived behavioral control

Personal characteristics of food producers that influenced their perceived behavioral control included education, previous job trainings and experiences, and personal preferences. Most of the urban producers interviewed for this study did not have a formal education in agriculture or a related field. But the producers highly appreciated the non-formal education they received growing up in rural agricultural areas, and working in their own garden which influenced them to become urban producers at the adult stage. R9 appreciated her degree in Horticulture which provided her with the sound agricultural knowledge to start and operate her own farm. According to R9, her “educational background is congruent with farming as a lifestyle too.”
Personal and professional experiences of respondents have also been influential on their decision to become urban food producers. R9 discussed her experiences in working with food producers in different states as a part of her job. Those experiences with farmers have helped her to understand “some of the issues and concerns farmers were having” and motivated her to become an urban producer. R10 has traveled to different countries in the world, some of which are highly agricultural. During those visits, she explored different food systems in those countries which made her interested in becoming an urban food producer.

I think the travelling I did after college was one of the things that drew me into farming. I went to Tunisia, Egypt, Korea, and India. Their food systems are different. That is something that interested me. In Tunisia, I got probably the healthiest example of a local food economy with high quality produce that interested me. Just experiencing those kinds of things got me think about it. I was in India. Then I realized that development should come from within community. You can’t take 25-a year-old from Ohio stick them in Panjab, India and expect them to do anything. So, I decided that I need to come back to my own community and do it here.

Several producers expressed their concerns about the personal health benefits as the fact that influenced them for urban farming. R15 stated that he “started getting out of shape and not feeling well” which motivated him to grow his own food. He went on to say “I realized the direct correlation with our food and our health. You are what you eat!” R3 explained how her realization of the fact that the things she grows in her garden tasted better and the feeling of satisfaction in growing them which influenced her to become an urban producer. Other personal factors mentioned that influenced respondents to become urban producers included passion for agriculture, desire to share fresh produce with others, and preference to work at home.

That was like our kind of motivation. We had a few motivations. One of the things were to learn how to grow crops and plants. We both like how to experience green house, nursery, we wanted to learn more about growing crops. That was one goal. Another goal was learning about how to build a business. (R 14)
Professional job trainings. R4 received as a garden educator, and on the job experiences training and working with kids to develop gardens made him interested in becoming an urban producer of his own farm. R4 mentioned about his “boss” who was a city horticulturalist inspired and encouraged her to become an urban producer. R2 has been a culinary professional working in restaurants. She said, “the respect” she felt for food producers motivated her to start a farm of her own.

R9 has lived in the Caribbean for a long time and she has always had a small farm of her own. That experiences of operating an urban farm has influenced her to become an urban producer in the city of Columbus.

I grew up in a farm system and then the majority of my career I lived in the Caribbean and I always had a small farm there. So, when I moved to Cuyahoga to take a position with OSU I wanted to have a farm again and being an Urban Farmer was my option. (R9)

The desire to work from home has been another motivation for respondents to select urban food production. R7 and R3 mentioned that it is always been a goal for them to work from home. R3 went on to say “working from home has always integrated to my life seamlessly. My daughter will be getting dressed for school and I can go out and check on something or feed the chickens or water some seeds really quick.”

Influences of resource availability towards perceived behavioral control

Availability of resources has a direct influence towards perceived behavioral control (Taylor & Todd, 1995). Resources relevant to urban farming include human resources, financial resources, and natural resources. The producers interviewed for this study complained about the unavailability of funds, markets, and land which limits their capacity to produce food in urban areas. R1 complained about not having “enough” land to work as a “full-time” producer even though “farming is his only job.” Affording more land has been difficult for the respondents.
because of the high price attached to it. The availability of a market is another constraining factor. Even though Columbus has a plenty of market options, respondents have to compete with rural producers and non-profit producers to sell their produce at the farmers market. Production cost being higher in urban areas, selling produce at a competing price has been difficult for the producers. R1 stated that “there aren’t many options for local produce to be sold in a store other than a farmers’ market and restaurants.” Moreover, because of the social mission attached to non-profit farms, consumers prefer to buy produce from them. Respondents perceived that non-profit producers “drive prices down” which is unfair for for-profit producers who “have to pay for everything out of the pocket” while non-profit producers get “more grants” and “free labor.”

I don't understand why it's called “non-profit” because they seem to be the ones with the money. A lot of people have problems with non-profit because they might drive prices down. I feel like in general people want to be fair to one another (R 7).

Conclusions, Implications, and Recommendations

The results of this study confirm that attitudes, subjective norms, and perceived behavioral control play a significant role in the decision of the respondents to continue farming in urban areas. The results of this study do not show that the respondents are in a position to address food insecurity issues in Columbus. The number of urban farms in the city is comparatively less than rural farms and the price of their produce is higher than that of grocery stores and rural producers. Therefore, it is questionable whether low-income consumers could afford to buy produce from the respondents considered for this study. But, respondents serve the purpose of meeting needs of consumers who prefer to buy environmentally friendly, locally-grown produce that is delivered to their door or could be purchased at the farmers’ market at a fair price. Therefore, facilitating conditions that help producers to continue food production in urban areas is important because it addresses the needs of a specific consumer segment of the city.
If a person believes performing a behavior has positive results, then that person will have positive attitudes towards his/her behavior (Fishbein & Ajzen, 1975). The opposite will happen if the anticipated results of performing a behavior is negative (Ajzen, 1991). Food producers’ evaluation of engaging in urban food production is considered an attitude. Relative advantage, complexity, and compatibility determine the attitude towards urban food production. Getting the highest price for produce, proximity to markets, decreased transportation cost, use of environmentally friendly practices, contribution for local food systems, opportunity to off farm income, and ability to work from home are some of the relative advantages of urban food production as perceived by respondents. Therefore, these factors identified by the respondents positively influence their intention to continue farming in urban settings.

Complexity includes all the barriers associated with producing food in urban areas. Complexity has a negative relationship with attitude. When the complexity of performing a behavior is high, individuals are reluctant to perform that behavior (Taylor & Todd, 1995). Legal, market, resource, and cultural challenges perceived by the respondents negatively influence their intention to continue farming in urban settings.

The existing needs of urban food producers, cultural norms, values, and past experiences determine compatibility. According to Tornatzkey and Klein (1982), when an innovation is compatible with the value system of an individual, it is more likely to be adopted. Factors identified under compatibility had positive influences on attitude. For example, social motives and social mission of the respondents to support the existing local food system, and eradicate urban poverty are positive influences on their attitude.

Subjective norms have a great influence on an individual’s intention to continue farming in urban areas. If the individual thinks that the people around him/her approve a specific
behavior, then the individual will have positive subjective norms towards the intended behavior and have greater intent than if subjective norms were weak (Fishbein & Ajzen, 1975). The influence from family, peers, and other organizations provided strong evidence for the existence of social pressure and social influence. Food producers do not act independently in society. Cultural and social factors continuously influence them. Therefore, they always refer their behavior to referents. This highlights the role of society which plays an important role in the intention of the respondents regarding engaging in urban food production. Several drivers for subjective norms were identified in this study which had both positive and negative influences; (a) family, (b) other food producers, (c) neighbors, (d) Extension and other organizations, (e) job supervisors, and (f) government and other policy makers. There are reasons why people consider important people’s opinions when making decisions; to seek permission, to share commitment to ideas and values, and to benefit from the knowledge of others (Martinez-Garcia et al, 2013).

Sometimes, even though the respondents have a positive attitude towards urban farming, the social pressure could prevent them from actively engaging in it. On the other hand, the people who are important to the respondents can motivate them to engage in urban food production. According to the results of this study, the respondents are more influenced by the people close to them such as family, neighbors, and peers. Family and peers have a positive influence towards the intention while neighborhood issues were more towards the negative side of it. Since the respondents are influenced by their social networks, disseminating information to both food producers and to their family would also be helpful in influencing the intention towards urban food production. Moreover, community mediation programs would be helpful to solve issues between neighbors and food producers.
Perceived behavioral control acts as a very strong determinant of behavioral intention (Ajzen 1989). Knowledge, skills, availability of information and other resources were considered as positive factors that influenced perceived behavioral control of the respondents. Perceived behavioral control of the respondents towards their own capabilities had a positive intention towards their behavior. The higher the perceived capability to engage in food production, the greater the intention for urban food production. In order to overcome barriers associated with knowledge and skills, Extension can design and deliver more programs targeting the needs of the respondents.

The role of the Cooperative Extension Service is also important in keeping the respondents in the food system and motivating them to continue farming in urban areas. Several respondents appreciated the knowledge and other training materials they received from the OSU Extension. Developing strategies to facilitate urban food production by creating more grant and funding opportunities, facilitating low-interest loans, small grants, and leasing city-owned lands is recommended to overcome barriers associated with resource scarcity. Urban environments are diverse in all aspects; socially, culturally, economically, environmentally, and politically. Therefore, approaches that aim to address issues in urban areas need to understand these multiple jurisdictions and interconnections between them (Gaolach, Kern, & Sanders, 2017). Adaptation of Extension programs would not be able to make a positive change in the lives of urban residents in the absence of infrastructure investments such as pollution and waste water management systems (Gaolach et al., 2015). Therefore, responsible city authorities need to take actions to facilitate urban farming in the city by considering its complex nature.

According to the Extension Committee on Organization and Policy (2002), the public’s expectation for Extension to answer their problems exceeds Extension’s own perception about
the public’s need. Serving large populations with a small number of staff, competing for funds, and operating amongst different agencies are some of the issues faced by urban Extension offices. This has limited their capacity to address complex urban issues (Gaolach, Kern, & Sanders, 2017). Therefore, recruiting Extension agents from urban areas who understands urban culture, and allocating more funds for urban Extension programs would be helpful in increasing Extension’s capacity to address complex urban issues. The concept of subject-matter centers implemented by Washington State University Extension is a great example of Extension strategies that provide Extension programs to urban areas with flexible staffs and extra resources (Gaolach et al., 2017). Moreover, the Urban Action Team of Kentucky Extension recommended developing key skills such as community networking, and collaboration for Extension agents working in urban areas (Young & Vavrina, 2014). Fox (2017) suggested developing both organizational and interpersonal competencies to act as trusted and effective facilitators in urban communities. This is a great suggestion for other state urban Extension agents who are working with diverse urban clientele with complex urban issues. Even though most Extension related recommendations were given for Extension practitioners in this study, the CES needs to think about strengthening technical expertise, funding, staffing, and programming to serve the urban clientele (Ruemenapp, 2017; Tiffany, 2017). More research on identifying factors that influence the respondents’ intention to continue farming can better align strategies, rules regulations, programs, and opportunities with current and future urban food production needs.
CHAPTER 6
CONCLUSIONS AND RECOMMENDATIONS

This chapter summarizes the findings of the previous three chapters to develop a cohesive understanding about urban food producers in Columbus, Ohio. A summary of each chapter is provided, followed by conclusions and implications. The final section of this chapter focuses on the recommendations for urban food producers, policy makers, Extension, and researchers.

Summary of Studies

The U.S. is becoming increasingly urban. The increasing demand for food has become an unavoidable issue with an increasing number of people living in urban areas. In terms of food security, urban dwellers are more susceptible to food related issues compared to rural people because food is not produced sufficiently in urban areas (FAO, 2009). If actions are not taken to adapt the challenges of population growth and urbanization in cities, urban dwellers being vulnerable to complex issues such as food insecurity and poverty become unavoidable. Therefore, urban food production has been identified as a source of income and a strategy for subsistence for urban dwellers. The need for a locally-grown new food system has been highlighted especially in urban areas that can supply fresh and nutritious produce to consumers and processors (Blay-Palmer, 2008). The demand and recognition for urban food production is increasing in this context (van Veenhuizen, 2006). Therefore, it is important to identify and explore the perspectives of producers who are already engaged in farming in urban areas, to motivate more people towards urban farming and to make recommendations to urban Extension programs that helps to tailor Extension programs that address the needs of urban farmers.

The purpose of this study was to identify urban producers’ perspectives of farming in urban areas. The specific objectives of the study were to,

• identify information needs and information-seeking behavior of urban food producers,
• explain urban producers perceived barriers to food production in urban settings, and
• identify urban food producers’ overall intention to continue food production in urban settings

Three related studies were conducted to explore the above-mentioned objectives. The methods used, objectives, and findings of each study will be covered in the next section of this chapter.

Information Needs and Information-Seeking Behavior of Urban Food Producers

Agricultural information acts as a determinant factor for the success of agricultural farms and other related enterprises (Boehlje & King, 1998). Having an understanding about what, when, and how urban producers gather information is important to address their needs. When the information received is relevant, up-to-date and, meets the clients’ needs it enables the ability to adopt new ideas and innovative technologies, providing more opportunities for success (Mchombu & Cadbury, 2006). The purpose of this study was to explore information needs and information-seeking behavior of urban food producers. A mixed method research design was used for this study. Semi-structured interviews and questionnaires were conducted to collect data. According to the results of this study, the respondents use a variety of information sources to gain information. They preferred online sources over other sources and trust people from their close social network to receive information. The presence of Extension is not strong in the area, even though producers preferred to receive information from Extension.

Perceived Barriers to Urban Food Production

An understanding of the barriers to urban food production is needed because, if not addressed properly, urbanization may lead to severe threats in urban communities such as food insecurity and poverty. The purpose of this study was to identify the barriers associated with urban food production in Columbus, Ohio. A qualitative design guided this study. Semi-
structured interviews were conducted 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.

**Urban Food Producers’ Intention to Continue Farming in Urban Settings**

Understanding the factors that influence the intention of food producers towards urban food production is important to predict their behavior. The purpose of this study was to describe the intention of urban food producers to continue farming in urban settings. The specific objectives that guided the study were (a) to describe the factors that influence attitude towards behavioral intention, (b) to describe factors that influence subjective norms towards behavioral intention, and (c) to describe factors that influence perceived behavioral control towards behavioral intention. Constructionism is the theoretical framework used for this study. The study followed a qualitative design. According to the results of the study, attitude is a strong predictor of behavioral intention. Complexity is a great determinant of attitude. Not having legal and institutional support hinders food producers’ intention towards urban food production.

**Overall Conclusions and Implications**

The findings of this study provided an overview of the urban food production in Columbus, Ohio. Although the overall purpose of the research was separated into three studies, the conclusions drawn from the studies overlap. Therefore, the conclusions and implications are presented as a reflection of the purpose of the study as a whole.

Attitude is a strong determinant of behavioral intention for urban food production. Attitude is positively and negatively influenced by several factors. Relative advantage, complexity, and compatibility determine the attitude towards urban food production as is confirmed by Taylor and Todd (1995) in DTPB. Getting a higher price for produce, proximity to
markets, decreased transportation cost, use of environmentally friendly organic practices, contribution for local food systems, opportunity for off farm income, and ability to work from home are some of the relative advantages of urban food production as perceived by the respondents.

Complexity includes all the barriers associated with producing food in urban areas. Legal rules and regulations imposed by zoning ordinances are the greatest barriers to urban food production. The respondents are reluctant to invest in their businesses because of the zoning restrictions, knowing that they could lose their business at any point. This has been proven as a barrier to urban food production in different locations across the country (Hodgson, Caton-Campbell, & Bailkey, 2011; Kaufman & Bailkey, 2000; Vitiello & Wolf-Powers, 2014).

Urban culture in terms of acceptance and neighborhood are not culturally supportive of urban agriculture. Especially because of the negative “acceptance” for urban farming in urban areas, many respondents are reluctant to present themselves as urban food producers. Pressure from the neighborhood in terms of neighborhood complaints, vandalism, and negative perceptions has made it difficult for producers to continue farming in urban areas. This aligns with the findings of Kim et al. (2014) about neighborhood issues.

Lack of available land, water scarcity, and soil contamination are important environmental barriers to urban food production. This is due to the competition for resources in urban areas. With urban cities being highly populated, many productive lands have been lost to construction of buildings for the increasing number of people (van Braun, 2007). Smit, Nasar, and Ratta (2001) identified proximity to residential areas as a barrier to urban food production because of the risk of contamination.
The influence from family, peers, and other organizations are strong predictors of behavioral intention towards urban farming. Society plays an important role in the decision-making process of urban food producers. Drivers of these social pressures identified through this study included (a) family, (b) other food producers, and (c) neighbors. The influence of family and other producers has been positive for urban producers. However, neighbors have exerted negative social pressure on behavioral intention. Negative pressure from neighbors include their negative perception of urban food production and their neighborhood complaints. Rogers (2003) in his *Diffusion of Innovations* mentioned that people tend to believe information received from immediate social connections (localite sources). There are many reasons why people consider important people’s opinion when making decisions such as; to seek permission, to share commitment to ideas and values, and to benefit from the knowledge of others (Martinez-Garcia et al, 2013).

Availability of information is a strong determinant for behavioral intention. The respondents use a variety of information sources. Those sources are selected by choice. The respondents prefer to receive information from the Internet and other electronic media over conventional information sources. They also prefer and trust close ties such as friends and co-workers to receive information from. This again aligns with the findings of Rogers (2003) about localite and cosmopolite sources and with Granovetter (1973) about strong and weak ties. According to Rogers, cosmopolite sources have access to different information hence, this source has the potential to bring in new information compared to localite sources. New information flows more through weak ties than through strong ties (Granovetter, 1973) because, connections in the close network circle of an individual tend to move similarly to that individual. This highlights the importance of weak ties in disseminating information to urban producers.
Visibility of Extension is a matter of concern in urban areas. Since Extension originated in rural, targeting their population, some urban producers are still not aware of the services they can receive from Extension service, while some of the respondents are completely unaware of the existence of Extension. Several research studies have stated that awareness, participation, and the use of Extension resources is low among urban populations. (Jacob, Willis, & Crider, 1991; Warner, Christenson, Dillman, & Salant, 1996). Bello and Obinne (2012) mentioned that when individuals feel the sources are credible, they tend to use those information sources. The respondents’ trustworthiness towards Extension and university resources is high, but they are concerned about the time, mode of delivery, and availability of Extension information. Some respondents believe that Extension is useful only up to a certain point and thereafter Extension cannot help with farming. Some producers who are aware of Extension programs feel as though they cannot benefit from Extension programs. This poses a challenge for Extension.

**Conceptual Model**

As the findings in this study indicate, behavioral intention to continue farming in urban areas is influenced by attitude, subjective norms, and perceived behavioral control. The conceptual model presented in Chapter 2 is still applicable to this study. Relative advantage, complexity, and compatibility influence the attitude towards behavioral intention. Referent influence affects the subjective norms. Perceived behavioral control is influenced by resource availability and personal characteristics. According to the findings of the study institutions such as CES, zoning, HOA, and other service providers have a significant influence on the behavioral intention of food producers to continue farming in urban settings. Extension’s influence on behavioral intention is both positive and negative in terms of information dissemination, program delivery, and professional interaction with urban food producers. Zoning ordinance and HOAs have negative influence on the behavioral intention. Therefore, adding an organizational factor
would further deepen the understanding about the context (Figure 6-1). Moreover, even though barriers were identified as a factor that influence attitude in the original conceptual model (Figure 2-2) barriers associated with different factors appeared to be great determinants of attitude, perceived behavioral control, and subjective norms. Therefore, an extra component was added to the original conceptual model that recognizes the influence of barriers to behavioral intention (Figure 6-1).

Figure 6-1. Revised conceptual model
Recommendations

Recommendations for Urban Food Producers

Findings of this research explained how the respondents who have negative relationships with their neighbors tend to have more issues compared to those who have friendly relationships with their neighbors. Therefore, it is recommended that the respondents try to build good relationships with their neighbors by talking with them and making them aware of what they practice while convincing them that they follow “environmentally friendly” practices. Extension, community organizations, and other responsible personnel in urban communities can moderate both parties to foster good relationships. The respondents could also share their excess produce with neighbors. This will assist in building a relationship with each other. Community mediation programs developed specific to urban agricultural issues could also facilitate communication and problem solving among neighbors and food producers when there is a conflict between them.

In the study, it was identified that the respondents have a higher level of trust towards the information offered by Extension even though they are not satisfied with the services they receive. If Extension services are provided in the way preferred by the respondents and if Extension information is delivered effectively, the respondents should be willing to accept those programs and information.

Glover et al. (2014) identified social capital as a critical barrier to the success of urban food systems. Some producers interviewed for this study had previous farming experiences while a majority of the respondents were new to urban agriculture. Therefore, it is imperative that urban food producers in the city build a social network to interact, communicate, consult, and share their experiences with each other. Developing social capital is important for the current food producers to connect with the people and organizations, and for the newcomers to build social networks.
**Recommendations for Extension**

Due to urban issues being complex and interconnected in nature, Extension cannot address all the issues without the support of the residents and other relevant authorities (Gaolach et al., 2015). Therefore, clear understanding about the multiple jurisdictions in urban areas is important (Gaolach et al., 2017). There is a gap between the public’s expectations from Extension and Extension’s understanding about the public’s needs (Extension Committee on Policy, 2002). A small number of staff with limited or no experience about urban contexts and lack of funds for Extension programs are some of the critical issues faced by Extension offices working in urban areas. This limits the Extension’s potential to provide solutions to urban issues (Gaolach, Kern, & Sanders, 2017). Washington State University (WSU) Extension’s subject-matter centers are a great example for Extension strategies that provide Extension programs to urban areas with flexible staff and extra resources (Gaolach et al, 2017). Implementing volunteer programs for urban Extension could be a solution to overcoming the problem of only having limited staff to serve urban clientele. Master Gardener Programs which heavily use the contribution of volunteers could serve as a model for urban Extension volunteer programs.

Visibility of Extension is a matter of concern in urban areas. During the study, it was realized that some respondents are unaware of the services they can receive from Extension while some respondents were completely unaware of the existence of this source. This aligns with the findings of NUEL (2015). This poses a challenge for Extension. It is recommended that awareness programs to be conducted among urban producers about the services available through Extension. Farmers’ markets could be a great avenue to spread the word about Extension, to those producers who are unaware of its existence. Since the respondents highly depend on co-workers and friends, producers who attended Extension programs could be advised to make other producers aware of programs and resources available through Extension.
leaders within the urban farming communities could be used to serve as opinion leaders to develop trust and make other producers aware of Extension services.

Preference for online and digital information delivery strategies highlight a need for a change in Extension information delivery modes. Extension need to focus more on electronic and other visual media to disseminate information to urban producers. As suggested by Mastel (2014), adopting new technologies will help Extension to expand its audience.

It was also realized that personal characteristics of an information disseminator also plays an important role. Several produces interviewed for this study stated that they had negative experiences with Extension professionals they talked to. Those unpleasant experiences made them feel dissatisfied and demotivated from seeking out help from Extension. Therefore, better understanding about the needs of clients will assist Extension professionals in designing and delivering effective Extension programs to urban clientele they serve. As reported by Young and Vavrina (2014), the Urban Action Team of Kentucky Extension has recommended developing key skills such as community networking and collaboration for Extension agents working in urban areas. It is recommended that other Extension offices in the U.S. has considered this recommendation and provided professional development opportunities for agents working in urban areas. Young and Jones (2017) identified the need for recruiting and retaining talented and skilled individuals in urban areas as the number one priority before implementing other steps.

Negative perception towards urban agriculture was identified as a critical barrier for urban food production. People may dislike agriculture because they are unaware of it and scared of the potential negative effects on them such as water contamination, health effects, and impact on land values. Therefore, negative perception towards urban farming can be resolved by informing and educating urban residents about of the importance of agriculture in the city. The
CES together with other responsible authorities can design awareness campaigns to promote urban agriculture and make residents aware of the importance of urban agriculture.

Actions need to be taken to encourage people to practice agriculture. This could be done through workshops and events. Urban residents should also be encouraged to buy produce from urban local producers. The city of Columbus should create more market options for urban food producers. The CES can help the city to identify barriers to entering new markets; such as restaurants.

**Recommendations for Other Institutions**

Ensuring food security in urban areas is one of the key components of sustainability in cities (Pothukuchi & Kaufman, 2000). 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. Zoning ordinances are the most critical barrier to urban food production in Columbus. Therefore, attention need to be given to revising city ordinances which would help urban producers to adopt them. The CES can educate the responsible authorities and recommend the need for action regarding a policy change. Bartling (2012) stated that advocates need to come up with strong arguments related to health, education, and nutrition requirements in order to suggest changes for city ordinances. Therefore, revising city ordinances and advocating for those revisions need to be done by balancing both parties; the residents and urban producers.

Ineffective communication and unawareness about city codes are also barriers to urban food production. The respondents must contact several agencies and departments to get information relevant to land use for agriculture, because they are spread out over several agencies. If the city can establish a department or a committee 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 lessening the time it takes to gather information. Educating the producers about legal aspects and legal requirements of urban farming is also recommended.

To overcome limitations for resources such as land, the city can develop a strategy to facilitate urban producers to purchasing city-owned land and leasing lands from private owners. Small grants and low-interest loans could be offered to commercial urban producers to motivate them more towards agriculture production. Cities like Cleveland, Baltimore, and Detroit have identified urban agriculture as a land re-use strategy and have created new plans to use vacant lands (LaCroix, 2010). These cities can serve as an exemplary model for Columbus to improve its urban food production system. Creating more grant and funding opportunities and government assistance for for-profit urban producers would help to continue agriculture as a sustainable income source.

**Recommendations for Future Research**

This study aimed at understanding the perspectives of urban food producers in terms of their information needs, perceived barriers, and behavioral intention to continue farming in urban settings. The respondents interviewed for this study were selected based on the nomination form the OSU Extension specialist and snow-ball sampling. The sample selected for this study did not represent a strong diverse population. Therefore, the researcher believes that there could be more producers in Columbus than this study reached. So, it is recommended that future studies should seek out more diverse producers to understand the context of food production in urban settings.

The methodology of the study included both mixed-method and a qualitative design to collect data. The use of mixed-method and qualitative design was helpful to gain a deeper understanding of the perspectives of urban food producers in Columbus. Other than in-person interviews used for that study, it would have been great if the researcher conducted semi-structured focus groups to collect data. Focus groups provide the opportunity to the respondents
to present their opinions, discuss them, and dispute ideas. Therefore, it is recommended future researchers consider conducting semi-structured focus groups to collect data which allow the researchers to explore pathways opened by participants (Merriam, 1998).

To understand the complete picture of urban food production, more research needs to be conducted in areas that were included in the conceptual model that weren’t addressed through this study. A similar study can be replicated in other states in the U.S. to see if there is any difference between the needs, challenges, and perceptions of urban food producers. Future research should also consider the perspectives of Extension agents and other professionals working in urban areas to add greater depth to the study. Moreover, more research needs to be conducted to gain an understanding of the diversity of urban areas. As mentioned in the previous chapters of this document both food producers and Extension agents are new to urban agriculture. Therefore, future research should aim at understanding the unique and intricate nature of urban environments in order to address the complex issues in urban areas (Ruemenapp, 2017).
APPENDIX A
PERSPECTIVES OF URBAN FOOD PRODUCERS ABOUT URBAN FOOD PRODUCTION
INTERVIEW GUIDE AND QUESTIONING ROUTE FOR FOOD PRODUCERS

Questioning Route
1. Please tell me a little bit about yourself, your farm and what you grow
   i. Do you come from a farming background
   ii. How long you have been farming?
   iii. Have you been farming in urban areas throughout those years?
   iv. Are you a full-time producer or a part-time producer?
   v. What type of facilities/technology do you use?
   vi. Do you own this farm? If so how long?

2. Can you take me through a typical day of your farm?

Now I would like to transition to another set of questions that focus on urban food production.
2. Why did you choose to start being an urban food producer?
   1. At which age did you think about starting an urban farm?
   2. Who introduced you to urban farming?
   3. Did your education have any impact on your decision/ how did you come to learn about urban food production
   4. Tell me about people that have influenced your decisions related your farm
   5. How has the community been involved in your farm?
   6. What about other urban farmers?
   7. How did you learn how to operate a farm?

3. Where would you like to see your farm in another 10 years?

4. Could you describe the advantages of being an urban food producer?
   1. compared to another profession
   2. compared to producing food in a rural area.

5. What advice would you give someone who is interested in becoming an urban farmer?

6. What are some of the current challenges and barriers you face?
   1. How are you trying to overcome these barriers?
   2. Do you know if other farmers that you know experience the same challenges?
Next I would like to ask some questions about your connections with other people and how do they influence on your farming activities

7. When you have a problem that must be solved on farm, where do you normally go?
   1. Who are the people, organization and sources you use to obtain information and to make decisions?
   2. Can you give me the type of information you receive from them
   3. How do you connect with them?
   4. How often do you interact with them?
   5. What type of influence do they have on your decisions related to farm?

Next I would like to hear about your experiences with the The Cooperative Extension service.

8. Have you received information or training from the Cooperative Extension Services in the past? (3-5 years)

9. How did you receive this information from Extension service?
   (Conference, workshop, online website, etc.) If they mention about Cooperative Extension Service,

10. Can you describe your experiences with the Cooperative Extension service?
    1. What methods were used to teach/train urban producers?
    2. What did you liked about these methods?
    3. What did you dislike about these methods used?
    4. What would you change about how Extension services were provided to you?

11. Do you think Cooperative Extension service is beneficial to urban food producers?
    1. Do you believe you have benefited from The Cooperative Extension Service?
       i. (If yes), could you tell me more about that
    2. Do you believe other urban farms benefited from The Cooperative Extension service?

12. How do you think The Cooperative Extension can help you to meet your needs?

13. Is there anything else you’d like to share about your work in farming that I haven’t asked you?
Section 01 – Information Needs and Information-seeking Behavior

1. What kind of information do you need to improve your production and to be a successful urban producer?

2. Please mark the appropriate box with an “X” regarding the level of importance of following factors that you would consider when selecting the source of information related to urban farming.

<table>
<thead>
<tr>
<th>Item</th>
<th>Not at all important</th>
<th>Moderately important</th>
<th>Importantly</th>
<th>Fairly important</th>
<th>Very important</th>
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<tbody>
<tr>
<td>a.</td>
<td>Cost of access to the source</td>
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<td>b.</td>
<td>Credibility of the source</td>
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<td>d.</td>
<td>Relevance of the information source</td>
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<td>Availability of the information source on time</td>
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<td>Time taken to access the source of information</td>
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</table>
3. Please indicate your frequency of using following information sources and the level of trust you have about the quality of those information sources. Please mark your answers in the appropriate box with an “X”

<table>
<thead>
<tr>
<th>Very Poorly trust</th>
<th>Poorly trust</th>
<th>Moderately trust</th>
<th>Highly trust</th>
<th>Very highly trust</th>
<th>Never Use</th>
<th>Use 1-2 times per year</th>
<th>Use 3-4 times per year</th>
<th>Use about monthly</th>
<th>Use about weekly</th>
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<td>Family members or close relatives</td>
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<td>Friends or co-workers</td>
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<td>Commercial Trade Shows</td>
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<td>Food production magazines</td>
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<td>Events at Research Centers</td>
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<td>Articles in the local newspaper</td>
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<td>Other (Specify):</td>
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Section 02 – Interaction with the Cooperative Extension Service

Now we would like to hear about your interaction with the Cooperative Extension Service. Please mark the appropriate answers.

1. Are you aware about the services you can get from Cooperative Extension office?
   a. Yes ( )
   b. No ( )

   **If yes**

2. How often do you interact with the Cooperate Extension Service?
   a. Never use
   b. Use 1-2 times/year
   c. Use 3-4 times/year
   d. Use about monthly
   e. Use about weekly

3. We would like to find out how you feel about the information you received from the Extension office. Please rate your level of satisfaction/dissatisfaction with the Cooperative Extension Service with an “X” in the appropriate box

<table>
<thead>
<tr>
<th>Item</th>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Strongly Satisfied</th>
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<td>a.</td>
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<td>How satisfied or dissatisfied are you that the information was up to date and accurate</td>
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<td>How satisfied or dissatisfied are you that the information was delivered in time to be useful</td>
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<td>d.</td>
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<td>How satisfied or dissatisfied are you that the information was relevant to your situation</td>
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<td>e.</td>
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<td>How satisfied or dissatisfied are you that the information was easy to understand</td>
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<td>f.</td>
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<td>Overall how satisfied or dissatisfied are you with the service provided by the Extension office</td>
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</table>
Section 03 – Demographic Information

1. What year were you born? Please provide 4-digit year (e.g. 1975): ……………………

2. How many years have you lived in this area? Please provide in years.: …………………

3. How many years have you done farming in this area? Please provide in years: …………

4. Please indicate your area of farm production in acres: ………………… acres

5. Gender
   a. Male
   b. Female
   c. Other

6. What is the highest level of education you have completed?
   a. Did not graduate high school
   b. High school graduate (include GED)
   c. Some college, no degree
   d. 2-year college degree (Associate, Technical)
   e. 4-year college degree (Bachelors)
   f. Graduate or professional degree

7. What is your marital status?
   a. Single
   b. Married
   c. Other

8. What is your gross monthly income from farming?
   a. Less than $10,000
   b. $10,000 – $19,999
   c. $20,000 - $39,999
   d. $40,000- $59,999
   e. $60,000 - $79,999
   f. Above $80,000

9. What is the type of produce you have in your farm? Indicate all that apply
   a. Vegetable
   b. Fruits
   c. Livestock
   d. Other (please indicate): …………………
10. Please indicate the type of marketing strategy you use to sell your produce
   a. Wholesale
   b. Selling at the farmer’s market
   c. Setting at the farm
   d. Selling to restaurants
   e. Other (please specify)

11. Which category best describe your race?
   a. White/non-Hispanic
   b. Black/non-Hispanic
   c. Hispanic
   d. Asian American
   e. American Indian or native Alaskan
   f. Multi-racial (please specify) ..................
   g. Other (please specify) ..................

Thank you for answering the questionnaire
LIST OF REFERENCES


Vickery, K. K. (2014). *Barriers to and opportunities for commercial urban farming: Case studies from Austin, Texas, and New Orleans, Louisiana.* Retrieved from https://repositories.lib.utexas.edu/handle/2152/26500

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BIOGRAPHICAL SKETCH

Kumudu Kopiyawattage was born and raised in Sri Lanka. After completing her primary and secondary school education, she attended University of Peradeniya, Sri Lanka and received her bachelor’s degree in agricultural technology and management in 2011. After her bachelor’s degree she attended the Postgraduate Institute of Agriculture and received her master’s degree in development communication and extension in 2013. Following graduation, Kumudu worked as a temporary lecturer at University of Peradeniya, and as a lecturer at Rajarata University of Sri Lanka. Kumudu then enrolled in the graduate program of Department of Agricultural Education and Communication, University of Florida and received her doctoral degree in 2017.