

2015

Understanding competing motivations for urban agriculture: an analysis of U.S. municipal ordinance adoption

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Understanding competing motivations for urban agriculture: An analysis of U.S. municipal ordinance adoption

by

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A thesis submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

MASTER OF COMMUNITY AND REGIONAL PLANNING

MASTER OF SCIENCE

Co-majors: Community and Regional Planning; Sustainable Agriculture

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2015

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ABSTRACT

Municipalities are increasingly responding to zoning regulations that act as a barrier to the practice of urban agriculture activities. While there has been some case-study research on municipalities engaging in large urban agriculture policy efforts, a framework for analyzing urban agriculture ordinances on a national scale has not yet been established. This research is an exploratory analysis of the motivations for urban agriculture ordinance adoption utilizing a theoretical framework of neoliberalism to understand the potential for urban agriculture to be used either as a tool to reinforce or alter neoliberal structures. Responses from 34 municipalities throughout the United States that participated in a survey on urban agriculture ordinance adoption were utilized to construct a cluster analysis of cities based on levels of ordinance adoption and motivations for adoption. A multivariate analysis of variance (MANOVA) analysis was used to determine differences between clusters on selected socioeconomic variables. The cluster analysis resulted in four clusters. Two clusters were low or average on both motivation and adoption variables. Two clusters had higher scores on either motivation or adoption variables, but differed in types of ordinances adopted and major motivations for adoption. Economic motivations were linked with adoption of commercial urban agriculture ordinances. Cultural and health motivations were linked with non-commercial, retail, and animal urban agriculture ordinances. Clusters with low engagement involved mostly government agencies in drafting ordinances, whereas more engaged clusters relied on government agencies and a variety of community groups in initial stages of ordinance adoption. The clusters that were least engaged in urban agriculture primarily had a Council-

Manager form of government, compared to the higher engaged clusters with a Mayor-Council
form of government

CHAPTER I.

INTRODUCTION

The United States has traditionally relegated agriculture to the rural landscape, where expansive tracts of land can support large farms and production facilities (Lovell, 2010). In recent years, however, there has been a shift in how agriculture is perceived and realized. The sustainability movement has fostered interest in growing food and fiber products in one's own home or community (Schindler, 2012). From Boston to Seattle, residents are raising chickens in their backyards, composting food and vegetative waste, and gardening on vacant lots. Home and community gardening activities have increased dramatically in recent years. From 2008 to 2012 participation in food gardening increased 13% (National Gardening Association, 2014). The demand for local foods stems not only from the desire to eat fresh, healthful food, but also to support local economies and to protect the environment (Schindler, 2012; Agyeman & Simons, 2011). This consumer demand for local foods has driven the expansion of market opportunities for farmers. For example, there were 8,628 farmers' markets in 2014 according to a recent report by the USDA, which marks a 180% growth since 2006 (Low et al., 2015). Other ventures like urban farms and Community Supported Agriculture (CSA) operations have been touted as a viable strategy to build community and provide greater access to fresh produce (Brown & Miller, 2008).

These myriad strategies for producing food in the urban environment are collectively termed urban agriculture. While these forms of food provisioning have been practiced for

centuries, recent growth and interest in urban agriculture has prompted governments to address zoning issues in response to longstanding barriers preventing individuals from practicing these activities legally.

Background of the Study

Community gardens and other urban forms of food provisioning have typically been promoted in the United States during economic downturns. Community gardens were promoted during WWI and WWII to supplement food budgets. The environmental movement in the 70s drove the formation of alternative food production, including a revived interest in home production activities such as keeping animals and composting (Lawson, 2005). With the recession of 2008 and an uncertain economic future due to climate instability and other factors, alternative systems of food production are increasingly seen as way to mitigate economic and food security impacts (Golden, 2013).

The resurgence of urban agriculture has encountered barriers, as many of these activities are not allowed in municipalities due to zoning codes that separate residential uses from agricultural ones. The origin of zoning in the United States was predicated in part on removing “nuisance” uses like the keeping of livestock from city centers (Herbster, 2000). With the establishment of sanitation systems and a greater understanding of how agricultural uses can work within urban environments, these zoning ordinances are becoming outdated and overly restrictive (Butler, 2012). Yet despite the growing viability and popularity of urban agriculture, municipal awareness of the barriers to increasing access and availability to local,

fresh food that regulations create is lacking. Most planners have neglected this for various reasons, but interest in food and land access has become a larger problem and planners are taking notice (Mukherji & Morales, 2010; Pothukuchi & Kaufman, 2000).

Research efforts are also lagging behind the rapidly developing urban agriculture movement (Bartling, 2012; McClintock, Pollana, & Wooten, 2014). Most research focuses on larger cities and highly visible projects, yet there has been a lack of critical analysis regarding even those urban agriculture initiatives that have been identified. In studies that do identify communities embracing urban agriculture, few go beyond identifying existing policies and programs. I wish not only to identify these efforts, but to examine the drivers behind adoption of these efforts.

My interest in this research evolved from my work under grants from the Leopold Center for Sustainable Agriculture. The focus of these projects was to identify legal and policy barriers to local foods. The first prong addressed barriers at the municipal level, resulting in a guidebook entitled “Reducing Local Regulatory Barriers to Local Foods: Municipal Zoning for Local Foods in Iowa” (Taylor & Vaage, 2015). One strategy for the guidebook was to collect relevant urban agriculture ordinances from municipalities across the country. It was this research that led me to understand the variability in the kinds of urban agriculture uses different cities had decided to allow.

I also examined many planning documents assessing urban agriculture initiatives. Most of these documents focused on a few large cities and disregarded efforts by smaller cities to

engage with urban agriculture. I noticed a dearth of literature and research examining a larger, national sample of cities that have addressed at least some form of urban agriculture in its zoning code.

Purpose of the Study

I focus on ordinance adoption as a measure of how local governments are involved in urban agriculture. This research is an exploratory analysis of the drivers of urban agriculture ordinance adoption. I aim to analyze the contextual motivations behind adoption of urban agriculture ordinances: were the ordinances used to quell complaints about urban agriculture, did they arise from grassroots efforts, or do they simply make way for more economic development? The research assesses municipalities throughout the United States to provide a broader framework for understanding urban agriculture policy.

The goal of this research is to determine where and why urban agriculture ordinances are being adopted and what the motivating force for their adoption is. To this end, I also include an analysis of socioeconomic variables of each community to determine whether there are commonalities between municipalities that adopt specific types of urban agriculture ordinances. This assessment uses a cluster analysis to form descriptive groups based on the types of urban agriculture ordinances adopted and motivations for adoption. I further test these relationships by performing a multivariate analysis of variance (MANOVA) on external socioeconomic characteristics.

Significance of Study

This study will lay the groundwork for future researchers to analyze the motivations and drivers associated with adoption of urban agriculture ordinances. There has been a general call for research evaluating the motivators to ordinance adoption and the influence groups have in initiating adoption of urban agriculture policies (Mukherji, 2009); although, to date, no such studies have been conducted on a large sample of municipalities. This study builds upon current research on ordinance adoption and is the first to provide a national assessment of urban agriculture ordinance adoption.

This research has special importance for those in the planning field. I take a novel approach to examining urban agriculture initiatives by evaluating the presence and importance of zoning ordinances related to a variety of urban agriculture activities in a municipality. Many planners grapple with understanding the history and context of these ordinances within the current regulatory framework. I hope to provide planners and other city staff with the knowledge and ability to evaluate the policy climate in their own communities regarding urban agriculture, and to understand the implications of planning in a neoliberal context. Planners are able to work in contestation to neoliberalism by advocating for social values and a just use of land, or they can reify neoliberal market ideologies by serving private interests in the name of public betterment (Baeten, 2012).

Research Questions and Goals

I ask three primary research questions in this thesis. The first two questions are intertwined and address the specific urban agriculture policy climate of a municipality. These questions examine the factors that are responsible for creating a shift away from regulatory practices that explicitly remove agriculture uses from urban spaces, to one where urban agriculture activities are being reintegrated into the urban landscape.

- 1) What kinds of urban agriculture ordinances are adopted in different municipalities?
- 2) Do communities adopt different kinds of urban agriculture ordinances based on their primary motivations?

Additional questions under these broad themes ask how important municipalities perceive urban agriculture to be and if outside groups/organizations play important roles in the adoption of urban agriculture ordinances. By addressing these questions, I hope to better comprehend the forces driving current municipal interest in urban agriculture.

- 3) What are the characteristics of communities that adopt urban agriculture ordinances?

I include socioeconomic characteristics, land characteristics of the city, and characteristics of the city government in my analysis to determine if commonalities emerge that may explain greater ordinance adoption in some cities over others. This question addresses both general factors influencing policy adoption and, more specifically, how these factors could influence the potential for implementation of urban agriculture ordinances.

Defining Urban Agriculture

So far, I have used the terms “urban agriculture” and “local foods” interchangeably. In referring to local food in this research, I mean those strategies that focus on connecting producers and consumers in the same geographical region, however defined. Urban agriculture is a component of the local foods system. It is an umbrella term that captures the variety of activities associated with agriculture occurring in urban landscapes. No one definition has been able to sum up the activities associated with the term urban agriculture. The most common definition, set forward by Bailkey and Nasr is, “Urban agriculture is the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities” (2000). This definition goes beyond the basic conception of a backyard or community garden and applies to a variety of activities related to the production, harvesting, processing, and retail of food.

Urban agriculture includes a multitude of activities involved with raising plants or rearing animals. Personal gardens in backyards, community gardens and urban farms are some of the more commonly referenced growing activities. Bees, chickens, fish, and livestock are also included. Other activities that are incidental to these include composting vegetative or animal waste and installing structures such as greenhouses and hoop houses to extend the growing season of plants. Marketing and retail efforts like farmers markets, food trucks and produce stands are also captured in this definition.

Beyond the production of food is the multitude of benefits attributed to urban agriculture.

Another definition of urban agriculture provided by the Council on Agriculture and Science

Technology (CAST) captures these additional benefits:

Urban agriculture is a complex system encompassing a spectrum of interests, from a traditional core of activities associated with the production, processing, marketing distribution, and consumption, to a multiplicity of other benefits and services that are less widely acknowledged and documented. These include recreation and leisure, economic vitality and business entrepreneurship, individual health and well-being; community health and well-being, landscape beautification; and environmental restoration and remediation (Butler et al., 2002).

These social benefits are often ascribed to urban agriculture regardless of the actual impacts the use may have. Many practitioners and advocates of urban agriculture cite these benefits as inherent to the use. Urban agriculture advocates often champion gardens and farms as a way to “bring back” nature into cities (Heynen, 2007). This hinders a critical analysis of what urban agriculture can provide, since, as Michael Classens explains, “the ‘natural’ aspects of urban gardens are either framed as unambiguously ‘good’ or beneficial, or overlooked as unimportant to the social change potential of urban gardens” (2014, pg. 231). The theoretical basis for this research attempts to critique these justifications to determine what role urban agriculture can actually play in transforming the urban environment.

Theoretical Framework

Theoretical models place urban agriculture within the local food movement. The local food movement flourished in the wake of the perceived failure of “organic agriculture,” which was originally defined by production methods that restored soil fertility (Harwood, 1990). The

movement was also rooted in the concepts of community support and environmental and social welfare, but has since been muddied with the co-option by industrial food producers that use the movement as a marketing strategy (Adams & Adams, 2011; Jaffee & Howard, 2010). Today, approximately four-fifths of organic foods on the market are sourced from two national distributors (Adams & Adams, 2011). Local foods then, were identified by many as the new and best alternative for creating a just food system.

In order to bolster the association of local foods with community and environmental goals, the movement is often encompassed in the broader alternative food movement. The alternative food movement seeks to create systems of food production that are oppositional to industrial forms of agriculture and commodity production, rebuild relationships between the producer and the consumer, and establish new forms of market governance and political association (Whatmore, Stassart, & Renting, 2003).

Many academics, politicians, and citizens alike have turned to local foods as the ideal form of food production and distribution. A common perception is that, simply by a foodstuff being locally-sourced, it is more just and socially responsible than other forms of food production (Born & Purcell, 2006; Morgan, Marsden, & Murdoch, 2008). Yet local food systems may still lead to environmental degradation and poor social outcomes. For one, there is the necessity for all people to be able to access and participate in these alternative food systems (Follett, 2008; Alkon & Agyeman, 2011). A scalar solution in the form of local foods does not mean all people will have the resources to participate in this system. Local foods are only a

means by which a goal is pursued; the means cannot on its own create the intended outcome, such as social justice or sustainability (Born & Purcell, 2006).

The food justice movement was an outgrowth of the alternative food movement as an attempt to link local foods to social and environmental goals. While the alternative food movement focuses primarily on sustainability, community and health, the food justice movement seeks to include racial, economic and environmental justice (Alkon & Agyeman, 2011). Food justice narratives untangle how neoliberal policies and the historic disenfranchisement of communities of color work to create harmful food systems (Alkon & Agyeman, 2011). It has been suggested that the food justice movement can create a broader network of support and better engage with policy processes (Werkerle, 2004).

The food justice movement can incorporate a greater diversity of potential actors in reimagining new food systems. However, I would argue an unspoken assumption of the food justice movement holds that place-based urban agriculture efforts are inherently positive if implemented correctly. This movement provides a good starting point for a critique of neoliberal economic policy and racial disparity, but fails to make critical distinctions between different urban agriculture projects. Guthman (2011) claims that the food justice movement cannot alter the unjust power relations inherent in the food system. Instead, the food justice movement strives to create change through alternative markets, rather than through political reform (Alkon & Mares, 2012).

The multiple and competing motivations for urban agriculture raise the issue of whether urban agriculture can effectively be utilized for a radical ends or if it is ultimately a tool of neoliberal urbanism. Different entities engage with urban agriculture for a myriad of motivations. Some types of urban agriculture are better suited than others in accomplishing certain goals. For example, a municipality that wants to pursue economic goals will likely allow uses like farmers' markets and commercial urban farms over other uses. In this context, urban agriculture has the potential to provide community benefits, but could also be used as a tool to maintain or reinforce neoliberal structures. An analysis of motivations is used to explain the contradictory tendencies of urban agriculture to result in both positive and negative outcomes (McClintock, 2014). It is within this framework that we can determine *who* is empowered by localization strategies in the food system (Born & Purcell, 2006).

Summary and Thesis Outline

I view the potential for alternative forms of urban food production through the adoption of urban agriculture ordinances to determine how planners and local governments respond to changing values and to further probe the question of whether planners reinforce neoliberalism or if they are able to work within the system to bring about change. I wish to investigate how urban agriculture ordinances are used as a tool to alter or reinforce neoliberal processes of the urban socio-environment (McClintock, 2014). Through this lens, I examine the various social and political factors that may influence planners and policy makers to adopt selective urban

agriculture ordinances. The following chapters will elaborate on these themes and provide additional context to the research.

Chapter II explores the history of urban agriculture and its relation to municipal zoning policy.

In particular, the link between removing livestock from the urban environment and the resulting urban/rural divide is investigated. The chapter also outlines the theoretical framework of neoliberalization and policy adoption as they relate to motivations for the adoption of urban agriculture ordinances.

Chapter III provides the methodology used to structure this research. The primary data collection method for this research was a survey sent to planning directors of municipalities in the United States. A cluster analysis was performed on policy and motivation variables obtained from survey data. A MANOVA was then used to test the significance of socioeconomic variables to the clusters.

Chapter IV presents a summary analysis of survey results and the initial findings in the cluster analysis and MANOVA model.

Chapter V presents a deeper discussion and interpretation of the results using the theoretical framework to evaluate cluster results. Grey literature and news sources are utilized to further assess the urban agriculture context in specific municipalities. Limitations to the study and opportunities for future research are also explored.

CHAPTER II.

LITERATURE REVIEW

Urban agriculture is more intensive and widespread in other countries than in the United States (Battersby and Marshak, 2014; Tornaghi, 2014). Most urban agriculture activities in the United States are directed towards individual uses, such as backyard gardening or raising chickens. In other countries, urban agriculture is an integral part of urban land use. For example, in Cuba, 14.6% of agriculture is conducted in urban areas (Ergas, 2013). There are specific reasons why urban agriculture is currently not as pervasive in the United States, one of which is the drive early on in the establishment of many cities to remove livestock, and the attendant elements associated with livestock, from growing urban centers.

Zoning regulations, established to separate these “incompatible” uses, are the most widely used regulatory tool employed by municipalities to control land use. Within this framework, agriculture is pushed to periurban or rural areas and is separated from the fabric of the built environment. Nowadays, the thought of farming or gardening in suburban front yards or vacant city lots is gaining acceptance, and a growing movement to reintegrate these activities back into urban spaces is forcing planners and city officials to reconsider prohibitive zoning ordinances.

Livestock and the Sanitation Movement

Many forms of productive agriculture activities including crop production, livestock raising, and attendant industries such as dairies and distilleries were a vital part of early cities (Brinkley and Vitiello, 2014). One example of the usefulness of livestock in the city is that of early piggeries as a form of waste management. Cities like New York allowed pigs to freely roam the streets. The pigs provided necessary sanitation services by eating the waste thrown out by residents, thereby keeping streets relatively clean (Brinkley and Vitiello, 2014). They were also important economically; poor residents of large cities often kept pigs or cows in order to feed themselves, and keeping livestock was a tolerated necessity to provide people with access to perishable food (Butler, 2012).

Prior to zoning, land use was guided by the law of nuisance. This concept was transferred to America from England, where conflicts were resolved through litigation when a landowner used her property in “ways that would interfere with the productive use of a neighbor’s land” (Abeles, 1989). As the United States expanded and urban centers achieved greater density, regulating uses under nuisance law became too burdensome. Proponents for greater regulation cited an increasing population and unregulated development patterns as problems resulting from an urban environment that was congested, noisy, smelly, and a hub for disease (Brinkley and Vitiello, 2014).

In the early 20th century, livestock was forced out of cities due to concerns over public health (Blecha, 2007; Butler, 2012; McClintock et al., 2014). In order to deal with the problems

of sanitation and waste management, new ordinances and greater powers were given to municipal governments. With the advent of boards of health, piggeries were cast as an unhygienic and unsuitable land use in cities. These boards drafted ordinances and other regulations to remove pigs and other livestock from urban areas.

The removal of livestock was a means to achieve goals beyond the improvement of physical sanitation systems. Many of these municipal governments were not only interested in removing livestock from the standpoint of sanitation, but also with the ulterior motive to remove immigrant and poor people from spaces that could be utilized for development projects. Maria Kaika writes in *City of Flows*, "Sanitation was not only a material imperative. It was also a matter of prestige for the urban elites who saw urban-social reform as their responsibility, and realized that this would contribute towards maintaining their established positions of power that were now threatened by social unrest" (2005, pg. 80). This process of sanitation and purification was embarked upon in order to purge the city from the environmental problems that plagued cities, but also the perceived social ills that were connected to the behavior and lifestyle of working and immigrant classes.

This imperative also affected formidable business interests, such as dairies, slaughterhouses and distilleries, who were adversely impacted by the removal of livestock from urban areas. These industries relied on the close proximity of animals and people. Poor residents were often employed by these industries, and residents could only access these products locally, in an era before refrigeration and other preservation methods (Brinkley &

Vitiello, 2014). The project upon which the urban elites embarked was able to remove both noxious agricultural and industrial uses from the city, while more insidiously pushing out those residents who relied on these activities for their livelihoods.

This task of sanitizing the city necessitated an expansion of the power of local governments, further entrenching the power of the urban elite. Local governments and boards of health invoked a broader understanding of police powers that were enforced to promote the health, safety, morals, and general welfare of a populace (Juergensmayer & Roberts, 2013). The invocation of police powers later became one rationale for the establishment of zoning controls.

Establishment of Zoning

Euclidian zoning is the tool whereby communities separate land into various “zones” or “districts” based on the type of activity and use intended for that area. Each district includes permitted and conditional uses, while also establishing uses and activities that are incompatible in those districts. Most of these districts are separated along the lines of residential, commercial, and industrial; zoning for agricultural districts was not firmly established until the 1950s (Daniel and Bowers, 1997). With the advent of zoning controls in the United States, agriculture uses become increasingly divorced from urban life. An oft cited rationale for zoning was to separate residential uses from agricultural ones (Schindler, 2012).

Zoning was adopted by many localities in the United States during the early twentieth century. New York City became the first city to adopt a comprehensive zoning ordinance in 1916 (Kwartler, 1989). The Standard State Zoning Enabling Act (SSZEA), drafted by the United States Department of Commerce in 1926, helped to further establish the structure and procedures for zoning (Meck, 1996). The eventual establishment of zoning enabling acts across all fifty states made zoning a powerful tool for local governments to impose uniformity of ideals and standards for physical development.

The continued disdain for agricultural uses in urban areas was apparent in this newly adopted zoning policy. In the landmark Supreme Court case that sanctioned municipal zoning in 1926, *Euclid v Amber Realty Co*, Supreme Court Justice George Sutherland remarked that, “A nuisance may be merely a right thing in the wrong place -- like a pig in the parlor instead of the barnyard” (272 U.S. 365). This ruling upheld a zoning ordinance that was largely focused on aesthetics, and confirmed the right of governments to regulate land use as a part of their conferred police powers.

Productive vs Consumptive Urbanism

This separation of spheres of activity was responsible for dividing “the producers and consumers of land uses” (Abeles, 1989). These laws created a foundation of policy that effectively removed vital sources of food and economic opportunities from city life. Those activities that were noncapitalist and reproductive, such as keeping livestock or growing a garden, became removed from the conceptualization of urbanism (Blecha, 2007; Brinkley &

Vitiello, 2014). Urbanism was configured to value the consumptive over the productive, thus creating a homogenous urban and suburban life and forming an urban-rural divide (Bartling, 2012). This largely affected women, children, and the elderly who were primarily responsible for these domestic activities, as well as immigrants who relied on home food production from both a cultural and economic perspective. This divide is explained in a passage in Brinkley & Vitiello's work on the history of animal agriculture in cities:

Despite working-class resistance and politicians' hesitancy to alienate these voters, municipalities and their boards of health gradually disentangled animal agriculture from public and private space, waste management, and certain links in the food supply chain. In the process, they established key precedents for the planning profession, including not only its separation of land uses but also its regulation of the urban poor and the demise of the organic infrastructure that connected waste streams back to food supply. They also separated the urban poor to a great extent from their sources of food, livelihoods, and sometimes their neighborhoods. Removing animal agriculture thus dismantled key dimensions of community food security as well as older, more organic systems of urban land use, economies, and waste management (2014, pg. 126).

With the removal of key methods for food and economic provision came an increasing reliance on industrial food and food assistance. Indeed, the growing consolidation of the livestock and meatpacking industries helped to bolster anti-livestock sentiments within cities (Brinkley & Vitiello, 2014). While most Americans became more reliant on purchasing meat and other groceries, those who subsisted on producing their own food were left to utilize new government programs formed to meet the growing need for food assistance.

The recent interest in urban agriculture suggests a reconsideration of what should be allowed in residential and urban spaces. This shift in thinking about agriculture in urban areas has surfaced several times in American history, especially during times of economic hardship

(Lawson, 2005; McClintock, 2010; Pudup 2008). In fact, most of the progress in reintegrating productive activities into urban spaces came about during economic crises and was seen by many as an “interim” use until normal development patterns could resume (Lawson, 2005).

Urban gardening and farming efforts were promoted during World War I and II and the Great Depression. The various forms of gardening efforts were labeled liberty gardens, relief gardens, and “Gardens for Victory” (Saldivar-Tanaka & Krasny, 2004). These efforts were in response to food shortages, and were also seen as a way to improve morale during wartime. In the 1960s and early 1970s, the USDA Cooperative Extension Urban Gardening Program funded community gardens in major cities. These gardens were created to support immigrants and African Americans in the production of their own food following disinvestment in urban centers (Lawson, 2005; Saldivar-Tanaka & Krasny, 2004).

The growing backlash against the industrial food paradigm was an additional driver of the increase in urban agriculture. The distancing of consumers from their food resulted in the greater emphasis and awareness of environmental concerns relating to pesticide use and the safety of conventionally-grown food (Lawson, 2005). Home gardening and composting became a reaction to this dependence on petrochemicals, and restored the ability for the home gardener to grow food without outside inputs and take control of his soil’s fertility (Pollan, 1991).

Despite these surges of interest in gardening efforts, most productive forms of urban agriculture are still banned or not wholly embraced in most cities. Use restrictions like

permitting schemes, restrictive setbacks, requirements for certain lot sizes, and other regulations can be overly restrictive even in communities that do allow urban agriculture uses. This overwhelmingly prohibits disadvantaged groups from engaging in these activities, since they are less likely to live in spaces with large enough lots or to be able to afford expensive permits (Schindler, 2012). Often these barriers to entry are planned. Even those early planners who wished to bring agriculture activities back into the city struggled with whether poor residents would be willing or able to maintain productive and aesthetically pleasing garden plots (Vitiello & Brinkley, 2014).

The most recent efforts to establish urban agriculture are addressing some of these issues of exclusion. A brief examination of the current rationales used to advocate for urban agriculture and the impacts of their implementation will be investigated. These rationales could be used to explain the motivations behind why some cities choose to embrace urban agriculture while others do not.

Motivations for Current Urban Agriculture Projects

While early urban agriculture movements were spurred by a need to increase food production, the current movements address additional needs such as the preservation of open space, the pursuit of educational opportunities, and the provision of community meeting spaces (Saldivar-Tanaka & Krasny, 2004). New federal programs supporting community gardens, such as the People's Garden Initiative established in 2009, reflect the social implications of urban agriculture. This program requires that gardens provide meeting spaces or food donations, are

run collaboratively, and use sustainable practices (Low et al., 2015). The multiplicity of benefits associated with urban agriculture stem from the potential for these activities to be multifunctional-simultaneously producing food while also providing opportunities for ecological functioning and space for social and cultural functions (Lovell, 2010). These benefits of urban agriculture can be nested within four broad categories: economic, social/cultural, health, and environment (Golden, 2013).

In response to this renewed interest, recent scholarship has attempted to enumerate and quantify the benefits associated with urban agriculture. A brief overview of these benefits outlines how urban agriculture has expanded beyond the realm of simple food production, and may provide the foundation for planners and advocacy groups alike to selectively utilize urban agriculture for specific goals.

Economic motivations

The impetus for emphasizing the economic value of urban agriculture initiatives stems both from the promotion of urban gardening during times of economic crisis as well as the more recent tendency to advocate for urban agriculture within a neoliberal framework of self-sufficiency and entrepreneurship. Unlike the community gardens grown in response to food shortages during both World Wars and the Great Depression, the current movements in urban gardening efforts focus on creating individual transformations, rather than on collective resistance (Pudup, 2008). These urban gardening and farming efforts use urban agriculture as a

tool to provide various services such as job training and business incubation (Albert, 2015; Krasny & Doyle, 2002).

On a larger scale, ventures like urban farms and CSAs (Community Supported Agriculture), farmers' markets, and farms stands are promoted as ways for communities to be more sustainable while also pursuing goals of economic development (Bradley & Galt, 2013). These uses require little infrastructure or financial commitment from a municipality, yet they can bring additional economic activity into an area and provide expanded markets for farmers.

Even non-commercial activities may be championed as having a positive economic effect. Voicu and Been found that home prices in New York City were significantly higher within 1,000 feet of a community garden than surrounding homes not near a garden. The effect was stronger in depressed neighborhoods and with higher quality gardens (2008). Of course, while this is a positive for some, it could also have a gentrifying effect in neighborhoods that have a history of disinvestment (Crouch, 2012, October 23; McClintock, 2014).

Social motivations

Urban agriculture is also seen as a way to improve the image of a community. The increase in home prices near community gardens outlined above could be attributed to improved aesthetics. These gardens are typically a response to disinvestment in urban areas in order to utilize vacant lots more productively, in part to improve the image of the area and decrease crime rates (Bradley & Galt, 2013; Lawson, 2005). These gardens can also be used for leisure and recreation and to preserve open space (Ferris, 2001; Patel, 1991).

Community gardens are also used as a tool to help specific groups grow plants that are familiar to them, gain job skills, or provide educational opportunities (Kerton & Sinclair, 2009; Krasny & Doyle, 2002). Gardens flourish in institutional settings, from teaching children how to grow food at schools to providing inmates job skills training in prisons (Blair, 2009; Lewis, 1994). For many, these gardens are the first foray into growing, harvesting, and preparing one's own food.

Farmers' markets and food trucks can serve as community gathering spaces. Many farmers' markets in particular offer entertainment and music in order to create a festive atmosphere (Taylor and Vaage, 2015). Both may offer culturally appropriate food items that may not be readily available elsewhere.

Health motivations

The effects of divorcing productive activities from urban life is also evident in people's knowledge and ability to prepare fresh foods. Knowledge of healthy food choices and how to produce or prepare food is key to many urban agriculture activities. Without a strong program educating residents about their food options, those with fewer resources will be less likely to have access to healthy food (Macias, 2008). Gardening efforts can help people not only increase fresh fruit and vegetable consumption (McCormack, Laska, Larson & Story, 2010), but also learn about healthier preparation techniques. Many gardens provide local community members with free food and education, thus increasing access to fresh, local produce (Larsen & Gilliland,

2009). Farmers' markets and other retail outlets like farm stands also give residents greater access.

Urban agriculture activities can also improve mental and physical wellbeing. Gardening and other agriculture activities require mental and physical exertion, yet can also be a space for relaxation and meditation. Gardens are touted as places for healing for not only the individual, but also for those located near a garden (Bellows, Brown, & Smit, 2003). Raising animals also has the potential to improve well-being and provides pleasure similar to keeping traditional domesticated pets.

Environmental motivations

Environmental concerns are the least documented in literature on urban agriculture. As cities face the uncertainty associated with climate change, urban agriculture could become a useful tool for environmental adaptation strategies. One avenue where urban agriculture could become important for environmental reasons is in the struggle that many cities are facing to maintain stormwater systems, especially with the forecast of higher intensity rain events stressing an already aging infrastructure (Freshwater Society, 2013). One solution to this problem is to create more area where water can infiltrate, rather than expanding the capacity of pipes to contain surface runoff. The strategies used to capture water before entering the stormwater system are referred to as "green infrastructure" (EPA, 2014). Urban agriculture in the form of rooftop gardens, vertical gardens, or conversion of impervious lots to gardens may be a strategy to retain water during rain events.

Vacant lots account for a major impervious surface increasingly becoming an issue in cities. A study conducted in New York City found that 60% of the area in vacant lots is impermeable (Ackerman, 2011). Many cities are seeing the percentage of vacant lots increase, due to disinvestment and central city population loss. The conversion of these lots to urban gardens could increase infiltration and minimize runoff.

Other benefits include the potential for livestock and general waste composting to provide fertilizer. These fertilizers can be used in lieu of petrochemical-based fertilizers which contribute to water quality problems. Composting can also help to improve soil infiltration, reduce erosion, and immobilize heavy metals commonly present in urban soils (McClintock, 2010).

Urban Agriculture as Reproduction of and Resistance to Neoliberalism

While many of the motivations for urban agriculture have the ability to bring about positive change, a further understanding of the current economic and governmental context is crucial to deconstruct the true radical potential of these movements. Within the context of the theoretical approach for this research, the varied and sometimes competing motivations for urban agriculture are explained by the contradictory nature of urban agriculture as simultaneously supporting neoliberalism while also opposing the same structure.

Current trends in economic processes are towards a market-oriented form of urban governance. This form of governance is in opposition to the Keynesian economic system and

New Deal policies that characterized the 1930s-1970s (Harvey, 2007). Under Reagan, neoliberalism became the dominant political economic force in the United States, with an emphasis on deregulation and marketization (Harvey, 2007).

Neoliberalization as a process is used to refer to a “prevailing pattern of market-oriented, market-disciplinary regulatory restructuring, one that is being realized across an uneven institutional landscape and in the context of heterogeneous, coevolving political-economic processes” (Peck, Theodore, & Brenner, 2009a) characterized by dynamic, “open-ended social processes” (Peck, Theodore, & Brenner, 2009b). This process of market restructuring creates uneven development patterns, resulting in both macro and micro forms of economic crisis. Cities are dominant in the process of neoliberalization (Baeten, 2012; Leitner et al., 2007). The form this process of neoliberalization takes in cities is sometimes referred to as neoliberal urbanism. In neoliberal urbanism, cities are entrepreneurial, with a primary directive for economic competitiveness (Leitner, Peck, & Sheppard, 2007). I argue the political economic context of neoliberal urbanism provides fertile ground for a resurgence in urban farming and gardening practices, not only as response to neoliberal policies but also because of them.

The motivations behind urban agriculture, therefore, are molded from the dominant values associated with neoliberalism or, alternatively, bottom-up challenges to neoliberalism. Nathan McClintock provides a compelling analysis of the major discourses surrounding urban agriculture. He writes that,

Urban agriculture, in its many forms, is not radical *or* neoliberal, but may exemplify *both* a form of actually existing neoliberalism *and* a simultaneous radical counter-movement arising in dialectical tension. Further, I contend that urban agriculture *has to be* both; indeed, contradictory processes of capitalism both *create opportunities for* urban agriculture and *impose obstacles* to its expansion (2014, pg. 148).

Many scholars argue that local food policy efforts are only able to bolster market-based food systems and do not challenge neoliberalism (Alkon & Mares, 2012). With this interpretation, cities use urban agriculture for entrepreneurial ends, not to provide social support, but for an economic development agenda to attract a specific set of residents much like the “creative class” made popular by Richard Florida (2002). In other cases, urban agriculture is used to increase land scarcity and improve the aesthetics and utility of vacant lots until development pressures are built up in the area (Kaufman & Bailkey, 2000). In urban agriculture projects with a neoliberal bent, individuals are responsible for their own education and work is for self-improvement to become better citizens (Leitner et al., 2007; Mayes, 2014; Pudup, 2008).

At the same time, urban agriculture is offered up as a radical, or at least reformist, solution to the effects of neoliberalization (Ferris, Norman, & Sempik, 2001; McClintock, 2014; Reynolds, 2014). Urban agriculture initiatives with social goals, like community gardens, are shown to be a response to neoliberal policies that “roll back” social support programs (Peck & Tickell, 2002). In this way, urban agriculture is a response to a loss of the social safety net.

Although neoliberalization is a dominant process in many cities, it should not always be at the center of discussion, as many alternatives are not a direct response to neoliberalization

and happen in places or times where it is not hegemonic (Leitner et al., 2007). Indeed, urban agriculture uses were excluded long before neoliberalism became the dominant economic rationale. Community gardening and other forms of urban agriculture were reintroduced into the city in times of market crisis. The current context of neoliberal urbanism simply shapes how urban agriculture is defined and under what agenda it is being promoted. Alternative agriculture practices have always worked as a strategy for various political orientations and ends. These alternative visions reveal how urban spaces are malleable and open to new social and economic forms.

Policy Adoption Framework

Beyond the theoretical approach of competing motivations for urban agriculture in the context of neoliberalism, I also examine municipal characteristics to determine if there are factors which support urban agriculture ordinance adoption. Recent research has tested hypotheses for policy adoption on various environmental ordinances, however, there has as yet been no research using this framework for urban agriculture ordinances.

Before a local government decides to create policy, some agent or group must propose that such a policy be adopted. The groups or interests in a city that initiate adoption of ordinances are varied. First, local residents may desire to engage in some kind of currently restricted agricultural activity, prompting these individuals to petition for the adoption of a policy. For example, a high school student in Guilford, Maine circulated a petition to allow chickens in her community, which was adopted as the basic proposal to the planning board

(Lange, 2015, January 4). In other instances there may be a non-profit or other informal group that brings together a group of individuals interested in advocating for these policies. An extreme example of this would be the Environmental Protection Agency's involvement in Milwaukee. The EPA brought together practicing urban farmers, non-profits, and city staff to identify areas in the city code that posed barriers to urban agriculture (EPA, 2012). A third possibility involves the idea being brought from within the municipality itself, for example, from a city council member or a member of the planning staff.

Policy adoption models are often crafted around a variety of internal and external factors (Berry and Berry, 2014). Internal factors include the economic, social and political context; whereas external factors capture the influence other levels of government and surrounding jurisdictions may play in policy adoption (Berry and Berry, 2014; Locke and Rissman, 2015). I look at the group influences mentioned above that may influence ordinance adoption in addition to an analysis of the internal social, economic, and governmental characteristics that may lead to the adoption of urban agriculture ordinances. The following section outlines the primary hypotheses for characteristics that may determine greater levels of policy adoption.

Social characteristics

Population seems to be a key determinant for general levels of policy adoption. Meltzer and Schuetz (2010), found that a large population was a predictor for number of policies adopted, with a larger city more likely to adopt a greater number of policies than a smaller one.

In terms of policies geared toward land use, Hawkins (2014) and Locke and Rissman (2015) found that municipalities with growing population had a greater desire for growth controls and policies that protect open space. These hypotheses fit well with the general belief that urban agriculture ordinances are usually adopted in larger cities.

The effects of other demographic characteristics, like diversity and age, weren't tested in the policy adoption literature studied. Instead, I view these characteristics as important to urban agriculture ordinance adoption due to the perception that urban agriculture is predominately for younger, middle-class, white residents (Reynolds, 2014).

Economic characteristics

There are several hypotheses regarding the potential economic reasons for adoption of urban agriculture ordinances. The overall affluence of a community may influence policy adoption. Communities which generate greater revenues are able to take risks and adopt programs with high start-up costs (Feiock and West, 1993). In the case of urban agriculture, those communities that adopt programs that the city is responsible for initiating and maintaining, such as a community garden program, would likely have higher fiscal capabilities. Wealthier citizens may also be more likely to protect their own interests and higher home values may indicate a stronger response towards protecting property values. Those municipalities with lower income and capacity may be less willing to remove land from potential for future development (Hawkins, 2014).

Governmental characteristics

Governmental or political characteristics within a municipality also affect whether policy is adopted. Municipalities take on different forms of government, which, in turn, may affect whether new policies are considered and adopted. There are five primary types of municipal government in the United States: council manager, mayor-council, commission, town meeting, and representative town meeting (DeSantis and Renner, 2002). The Council-Manager form of government is most popular, especially in larger cities. Many cities are turning towards this form of government as professionalization in government becomes more important (National League of Cities, n.d.). It is hypothesized that those forms of government with greater control and professionalization are more likely to adopt policies. This hypothesis is supported by a study on the adoption of anti-smoking laws, which found that municipalities that moved away from the mayor-council form of government were likely to adopt new policies, potentially due to the greater expertise found in these forms of government (Shipan and Voldan, 2008).

Another way to measure expertise and capacity for adoption would be to measure the administrative capacity of a municipality. Many studies have shown the importance of administrative capacity to the likelihood of policy adoption (Burby and May, 1998; Feiock and West, 1993; Hawkins, 2014; Locke and Rissman, 2015); these studies show that a strong staff is needed to increase the capability of a city to draft and enforce policy.

Summary

The great complexity in evaluating urban agriculture lies in its ability to be used for both a neoliberal and radical ends. If urban agriculture initiatives are *both* neoliberal and radical, a single hypothesis for the adoption of these policies is insufficient (McClintock, 2014). The multiple and competing motivations for urban agriculture arising in different spaces in a neoliberal political economic context can be utilized to explain why municipalities adopt ordinances allowing certain urban agriculture activities over others.

If urban agriculture is implemented as a “protective countermovement,” then we would see ordinances supporting forms of urban agriculture being implemented in areas where there is a retreat of capital (Polanyi, 2001). The forms of urban agriculture could be those that promote goals of social justice and community support, such as community gardens. However, they may also be those that are more aligned with the goals of neoliberal urbanism, such as urban farms and other forms of urban agriculture with entrepreneurial or profit-driven goals.

Viewing socioeconomic and political characteristics of municipalities through the lens of policy adoption may provide a new way of looking at the motivations that compel cities to adopt some forms of urban agriculture and not others. It may also be useful in determining important characteristics that make a municipality able to adopt new ordinances.

CHAPTER III.

METHODOLOGY

This study is designed to assess whether cities' adoption of new zoning policies allowing for urban agriculture could be neoliberal, such as using urban agriculture for entrepreneurial ventures, or if they are used by cities and planners as a "progressive, if not radical, return of the means of production to urban residents" (McClintock, 2014). The research is exploratory in nature. This study is the first to determine if there are potential links between ordinance adoption and motivators to adoption on the national level. The backbone of this research is a survey sent to planning directors of municipalities across the nation. In this survey, I measure the adoption of ordinances related to urban agriculture activities and the motivations and other influencing factors for adoption. The variables obtained from this survey are used to create a cluster analysis to find groupings of municipalities within the larger data set.

The data collected from the survey were analyzed by first performing a cluster analysis of variables relating to policy climate. Membership in each cluster was tested further using a MANOVA of socioeconomic variables collected from the U.S. Census and American Community Survey. These tests were utilized to answer the two primary research questions of this study:

1. What kinds of urban agriculture ordinances are adopted in different municipalities?
2. Do communities adopt different kinds of urban agriculture ordinances based on their primary motivations?

These questions are answered by using a survey sent to the directors of the planning department in each sample city. The survey identifies the types of urban agriculture a city allows and explores motivations for adoption and group influence, among other things. I determined whether commonalities may exist between cities by creating a cluster analysis based on weighted ordinance scores and scores for different motivations for urban agriculture.

3. What are the characteristics of communities that adopt urban agriculture ordinances?

I then examine other social, economic, land, and governmental variables to further describe clusters and test if there are significant differences between clusters. This is done by creating means of each variable by cluster and using a multivariate analysis of variance to test significance.

In the rest of this chapter, I explain the dependent and independent variables used in the research. I also provide a thorough assessment of the study participants chosen and the reason for targeting these individuals. I then provide rationale for each instrument and test used for this research. Details of survey design and methods of variable creation from the survey are explained. Finally, I outline the procedures used to conduct a cluster analysis and multivariate analysis of variance (MANOVA). The study was IRB exempt (Appendix B).

Sampling Design and Participant Selection

The unit of analysis in this research is municipalities throughout the United States (also referred to as “cities” or “communities”). These municipalities were identified from a database I created in conjunction with a grant from the Leopold Center for Sustainable Agriculture. The output of this project was a workbook entitled “Reducing Local Regulatory Barriers to Local Foods: Municipal Zoning for Local Foods in Iowa Guidebook” (Taylor & Vaage, 2015). As part of this effort, I collected ordinances on urban agriculture from January 2014 through March 2015.

To populate this database, I conducted a thorough search of literature and existing databases, including Growing Food Connections policy database and University of Missouri food systems database, which cited municipal codes addressing these topics associated with urban agriculture. I used search engines to locate news articles identifying cities that had gone through the process of adopting urban agriculture ordinances. I also conducted a more fine-grained search by entering words associated with urban agriculture into Municode, a hosting website for legal documents. This process allowed me to find codes from a more diverse range of municipalities. While it would be impossible to collect all ordinances associated with urban agriculture, this process was useful for capturing a large sample of municipalities that had adopted urban agriculture ordinances. To clarify, the sample obtained from this database is the list of municipalities discovered through this research that adopted urban agriculture ordinances, not the ordinances I collected individually.

I identified 66 cities that had adopted urban agriculture ordinances through this method of purposive sampling. The sample population was fairly diverse. 32 states were represented in the original sample population. Population size ranged from 1,365 to 2,718,782 according to 2013 ACS estimates. I then created a matched pair for each of these municipalities in order to control for potential differences in state governance. To do this, I downloaded the population list for all Census places. I then sorted by state and population. The matched pair was chosen by selecting a city within the same state and closest in population to the original city. With the inclusion of the paired sample, the final study sample was comprised of 132 municipalities.

Study participants

The persons involved in the survey portion of this research were either the planning director of a municipality or staff member who served a similar function in municipalities that do not have the capacity for a planning department. I refer to this person as a “planning director” throughout this thesis, regardless of the actual title of the person who took the survey. These persons are typically most knowledgeable about adoption and implementation of zoning code provisions and would be best able to accurately answer survey questions regarding these policies. Additionally, planners are subject to the directives of their employers, yet they also inhabit a unique space where they are able to advocate for the needs and desires of community members (Davidoff, 2012). Planners are able to engage in participatory processes that can include voices in a community that may otherwise not be heard. Planners may

therefore be the political point of intervention whereby creative solutions to bring about new dynamics in a city can occur (Heynen, 2014).

By assessing planners' motivations and understanding of their policy environment, I expect to gain a better sense of who is benefitting from attempts at community engagement and the policy formation that stems from this engagement. Neighborhood associations, for example, often represent white homeowners and exclude other groups (City of Minneapolis, 2015; Rohe & Stegman, 1994). Community meetings are often held after typical working hours, excluding community members who don't work traditional jobs (Kelly, 2010, pg. 96). Language and cultural barriers are an additional impediment for adequate public participation (Tran et al., 2013); especially in the case of undocumented immigrants who may be wary of government involvement. The survey, then, is structured to not only understand why the city chose to adopt urban agriculture ordinances, but what influence outside groups may also have in the adoption of ordinances.

I reviewed the website of each municipality included in the study to find the contact information of the relevant department. In most cases this was the planning department, but for smaller municipalities the relevant contact was often a city administrator or city clerk. While in some cases I was able to identify the person in head of the department, in most cases I was only able to find a general department email. Specific contact information has been removed from the survey and research results.

Instrumentation

I collected data through a survey instrument. I chose a survey as my data collection instrument because it enabled me to collect information from a geographically dispersed sample population. The survey was delivered through Qualtrics, an online survey software. Surveys conducted on the internet are useful in that they take less time to transmit, have lower delivery cost, more design options, and take less time for data entry (Fan & Yan, 2010). In addition, the online format gave participants the ability to research answers since the survey addressed issues that are not common knowledge (Alreck & Settle, 2004; Miller & Salkind, 2002).

The survey first asked respondents to identify what explicit urban agriculture ordinances they had adopted permitting the activity based on a list of eighteen different types of agriculture-related activities. Two additional questions asking about a general urban agriculture ordinance or urban agriculture district were also included. I structured the survey so that each municipality would be able to self-identify which ordinances in their code relate to urban agriculture. Respondents could choose “yes,” “no,” or “Attempted, but failed” to a question asking whether they adopted an ordinance on these topics. They were also asked to provide the ordinance reference and year adopted if they chose “yes.” Ordinances that mentioned urban agriculture uses, but did not permit the use, were not to be included in the “yes” category.

Many of the following questions were based on a Likert-scale. Two questions were asked regarding the importance of urban agriculture to the planning officials and community on a 5 point scale ranging from “not important” to “very important.” Two series of influencing factors followed measuring group influence and the influence of various benefits and downsides of urban agriculture to the decision to adopt urban agriculture ordinances. These survey items were developed from applicable literature. Next, the survey collected data about perceived changes in participation in urban agriculture and complaints arising from the practice of urban agriculture after ordinances were adopted. Questions about the provision of informational materials on urban agriculture and related ordinances followed. Finally, the survey asked questions about the jurisdiction in question: name of the municipality, number of zoning code enforcement staff members, and form of municipal government. The full survey can be found in Appendix A.

One problem for web-based surveys is the lower response rate they receive compared to traditional methods of survey distribution. A meta-analysis of 45 studies examining differences in the response rate between web surveys and other survey modes estimates that the response rate for web surveys is on average approximately 11% lower than for other delivery methods (Manfreda et al., 2008).

In an effort to boost the response rate, a prenotification letter was mailed to the director of the planning department or similar representative of each municipality. Studies have suggested that prenotification letters can boost response rates for web-based surveys

(Kaplowitz, Hadlock, & Levine, 2004). The letter followed IRB requirements for exempt studies and provided an explanation of the study and its purpose along with a link to the survey. It also outlined the voluntary nature of participation and the confidentiality of responses; contact information of the principal investigator was also provided if study participants had any additional questions or concerns. This mailed prenotification letter was followed up with two email notifications. The first was sent one week after the letter was distributed and the second was sent three weeks after the original prenotification letter was distributed. The same information was present in all notifications; however, slight modifications were made to wording per survey research recommendations (Dillman, Smith, & Christian, 2009). The survey was open from June 24, 2015 to July 28, 2015.

An additional consideration for the response rate was the target of my survey. My survey was conducted at the organizational level, which necessitated that I contact directors of that organization, in this case planning departments. Baruch and Holtom hypothesized that the average response rate would be lower for surveys targeting representatives of organizations than for those targeting individuals. They found that the average response rate for the organizational level was 35.7% with a standard deviation of 18.8, compared to a response rate of 52.7% with a standard deviation of 20.4 for surveys targeting individual attitudes (2008). Several studies have suggested that 35–40% is an adequate response rate. (Baruch and Holtom, 2008).

I had a response rate of 25.8%, which is lower than the suggested rate, but within one standard deviation of the average response rate seen in other organizational surveys. I

calculated my response rate by dividing completed surveys by the original sample size (34/132). Completion was determined by assessing if all questions used in the cluster analysis were answered to, at minimum, 90% completion. Surveys were retained for the sample if a question was only partially completed (for example, a respondent only marked the ordinances they had on a specific topic and did not complete the questions for ordinances they did not have). The final sample was composed of municipalities in both groups from purposive sample: municipalities selected from Leopold Center for Sustainable Agriculture project database comprised 62% of the sample, while municipalities from matched pair comprised 38% of the final sample. I downloaded and cleaned survey data in an Excel spreadsheet. Analysis of data was either conducted in Excel and SPSS statistical software.

Cluster Analysis Methodology

I conducted a cluster analysis in order to construct a classification of cities based on policy adoption and motivation for adoption. Cluster analysis is a multivariate statistical tool that encompasses many possible methods of classification. Cluster analysis is rooted in the social sciences and is a useful descriptive tool. It has been used extensively in market research, psychiatry, and archaeology (Everitt, Landau, & Leese, 2001). It is widely utilized to order a large data set into smaller groups, in order that patterns in the data can more easily be summarized and described (Everitt, Landau, & Leese, 2001). My use of cluster analysis to describe policy environments is largely experimental.

One challenge of cluster analysis is establishing the correct set of variables to define the cases and the issue under examination (Ritter, 2015). Although I collected a variety of variables from the survey results, I only used those variables focused on ordinance adoption and influence of urban agriculture motivations in the cluster analysis. These variables were based on multiple survey items that were combined into aggregate variables using the methods explained below. There is no minimum sample size required for cluster analysis, however, it is important to balance the number of variables with the total number of cases. Too many variables and too few cases could lead to poor segmentation (Mooi & Sarstedt, 2011). The reduction in variables by aggregating survey items into a single variable can create a higher quality and easier to interpret cluster solution.

Weighted ordinance scores

The weighted ordinance score is based on survey responses to the ordinance adoption question. The score is constructed by creating weights based on the presence/absence of an ordinance multiplied by the importance of that activity to a strong urban agriculture policy environment. Eighteen urban agriculture-related activities were divided into four subcategories: animal agriculture, non-commercial agriculture, commercial agriculture, and retail uses. The survey questions testing whether a municipality had a general urban agriculture ordinance or urban agriculture zoning district were not used in this analysis, since I only test what uses are effectively allowed, not the type of zoning provision the uses are allowed under.

These subcategories attempt to differentiate urban agriculture activities based on their function within the food system. Several researchers have attempted to create a typology of urban agriculture. Nathan McClintock (2014) created a typology of urban agriculture by categorizing activities on scale, function, labor/management, and market integration. A second typology places activities in a matrix based on dimensions of extensiveness and intensity of the use (Mukherji & Morales, 2010).

Both typologies are structured around what or whom the author is addressing. McClintock examines urban agriculture in the context of how it operates as both a neoliberal and radical project (2014). Mukherji and Morales address planners and envision urban agriculture as a land use activity defined by its form and function (2010). I look at urban agriculture both from a regulatory perspective, how activities are treated in zoning code, and from a goal-oriented perspective, what types of activities are likely to be implemented together to meet a specific motivation or objective. Obviously, this typology is subject to overlap. For example, a community garden may allow sales and thus have some elements of a commercial use. The expectation is that the combination of activities into one category will provide a reasonable picture of a municipality's intentions for engaging in urban agriculture.

The validity of this measure is subject to how accurate the responses were. I did not review every city code to determine whether the questions were answered correctly. For one, not all respondents provided the ordinance or code reference. An additional consideration is the potential presence of "silent" ordinances that may allow for urban agriculture by not specifically prohibiting or permitting the use (Castillo et al., 2013). Some respondents left

comments that they marked they allowed a use, even though they don't have code explicitly regulating the use. Although my original intention was to identify communities that have explicitly engaged with urban agriculture, I had to alter my assumptions and trust that respondents know what their code actually allows/doesn't allow in their specific policy context. The strength of this assumption is that the analysis focuses on what uses are allowed in the municipality regardless of how the municipality structures or enforces its code.

The method for creating ordinance weights was developed from a study conducted on policies for effective farmland protection (Clark, Inwood, & Jackson-Smith, 2014). This study computed a weighted policy score by multiplying presence and strength of the individual policy by importance to the policy topic. Since I did not review each ordinance individually, I could not create a reliable score for the strength of the ordinance. Therefore, my score is weighted on two variables:

$$\textit{Ordinance score}=\textit{Presence}*\textit{Importance}$$

The first variable was based on presence of an ordinance to the specific urban agriculture activity (0=absent, 1=present). The score for this variable was determined based on survey responses. The variable was then multiplied by the relative importance of the ordinance to urban agriculture (1= relatively weak policy, 2=stronger policy, 3=strongest policy). The final score thus had a value ranging from 0-1. The importance score was developed from literature; rationale for each score can be found below. Major factors considered when assigning a score include intensity or extensiveness of a use (Mukherji & Morales, 2010), the historical treatment

or presence of this activity in urban areas, and the typical degree of policy change required to allow this activity. Scores for importance were added together and divided by the total possible score in the subscale for each city. Importance values for each activity are shown in Table 3-1.

A score of 1 denotes an activity that has likely already been addressed in many communities and is an existing practice. Typically, these uses have less impact on the land and are not very extensive. Activities given this score are generally weak indicators of a robust urban agriculture policy environment.

A score of 2 may have elements of both a weaker and stronger use. The intensity or extensiveness of the use may be high, but have few nuisance characteristics.

A score of 3 would suggest the activity has a large impact on surrounding land and may alter the characteristics of the neighborhood or land the use is practiced on. These activities have historically been disallowed in urban areas, and a new ordinance allowing the use is more difficult to adopt.

Table 3-1: Ordinance importance weight scores

<i>Urban Agriculture Activity</i>	<i>Importance weight</i>
Animal Agriculture	
Aquaponics	2
Aquaculture	2
Bee keeping	2
Chicken keeping	1
Goats and other livestock	3
Retail	
Farmers markets	2
Food trucks/pushcarts	1
Commercial Production	
Urban farm/CSAs	3
Commercial greenhouses	2
Hydroponics	2

Table 3-1 continued

Non-commercial Production	
Community gardens	2
Vacant lots	3
Right of ways	3
Rooftop	2
Front-yard	2
Composting	1
Season extenders	2

*Ordinance weight values: 1= weak 2= stronger 3=strongest

Animal Agriculture Literature Rationale

Animal agriculture includes all activities primarily geared toward the raising of animals. Other ordinances may also allow for animals. For example, an urban farm ordinance might allow for the farmer to keep bees in addition to producing crops. This subcategory focuses only on ordinances addressing the raising of animals as the primary activity.

- **Aquaponics** combines hydroponics, the growing of plants in water, and aquaculture, the raising of fish, into one integrated system. Aquaponics systems simultaneously produce edible plants and fish. Fish waste fertilizes the plants which then filter the water to be recirculated back into the fish tank. Both aquaponics and aquaculture on its own require a modest amount of equipment, especially with greater intensity operations. Cities that specifically allow these uses show they are aware of different methods for raising fish.
- **Bees and Chickens** are the most common animals allowed in a city that is starting to engage with animal agriculture. These “egg and honey ordinances” are the standard for cities looking to allow residents to produce their own food (Brinkley & Vitiello, 2014). Both bees and chickens can be kept in relatively small spaces. Bees are given a higher

score than chickens simply due to the danger associated with bees from the potential for stings and swarming (Moore and Kosut, 2013).

- **Goats and other livestock** have historically been removed from urban areas, as detailed in the previous literature review. Recent regulations that allow for goats and other livestock have met more vociferous opposition than some other forms of urban agriculture, primarily due to noise and odor concerns (McClintock, Palana, & Wooten, 2014). Goats require shelter and space to roam. They are more visible and potentially more destructive than other forms of animal agriculture. Cities that allow goats and other livestock show a serious commitment to animal agriculture.

Retail Literature Rationale

The retail subcategory includes activities with an emphasis on the selling of produce and other agricultural products. As with the other subcategories, there is potential overlap when another use also allows the sale of produce. One problem with this subcategory is the small number of activities. Farm stands are another retail use that should have been included in the survey, but was inadvertently omitted. This omission is potentially a limitation to this ordinance subcategory.

- **Food trucks and pushcarts** are forms of mobile food vending. They are included as an urban agriculture activity for their ability to bring fresh produce to areas that are considered “food deserts” or areas that may not be able to support traditional retail outlets (Morales & Kettles, 2009). Since not all food trucks provide fresh produce, they are given the lowest possible ordinance importance score.

- **Farmers' markets**, on the other hand, almost always offer fresh produce. Many farmers' markets require a percentage of vendors to produce their own products. Farmers' markets are usually open seasonally, and codes can differ by allowing markets in a certain location or by allowing them in specific zoning districts.

Commercial Production Rationale

The distinction between the commercial subcategory and the other subcategories is less apparent. Activities were considered commercial if they were primarily implemented for profit-driven goals. Activities that could be considered either commercial or non-commercial were placed into one of the respective subcategories based on how policy is generally structured. For instance, hydroponics were included as a commercial use since many municipalities structure the ordinances allowing the use with the assumption that the use is commercial and therefore fairly intensive.

- **Urban Farms and CSAs** are usually the largest and most intensive urban agriculture activities. These farms may require small tractors, pesticides, and more workers. Typically, many additional uses are allowed on an urban farm such as raising animals and selling produce.
- **Greenhouses for commercial production** can be used to produce a variety of horticultural products. Not all greenhouses produce edible plants. While greenhouses can be used to grow food, the regulations that allow for commercial greenhouses do not typically single out greenhouses solely for food production.

- **Hydroponics** involves the growing of plants in water. This use faces zoning issues similar to greenhouses. If hydroponics are addressed in a code, it is often because the scale of this use is large enough for commercial operations.

Non-commercial Production Rationale

The non-commercial subcategory includes the largest number of activities. Unsurprisingly, this subcategory may overlap with others. An activity is included in this subcategory if the primary function is for individual or community use. Regulations pertaining to *where* crop production is allowed are included in this subcategory.

- **Vacant lots and right of ways** are non-traditional public spaces for food production. This radical use of space is usually used to provide food in economically depressed areas (Crane, Viswanathan, & Whitelaw, 2012).
- **Rooftops and front yards** are also non-traditional spaces for food production, however, these locations are usually privately owned. Many times, cities are forced to examine their stance on growing food in these areas over disputes about property rights.
- **Community gardens** are what people typically associate with urban agriculture. Community gardens are usually open to the public. Members of a community garden are often assigned a section, or plot, of land. These gardens can be owned or run by a municipality or other organization. Most community gardens do not primarily operate to sell produce, although sales are sometimes allowed incidental to the use.
- **Composting** converts food and vegetative waste into a nutrient-rich humus (Jauron, 2013; Starbuck, 2010). Composting can occur on many scales; however, the survey

question addressed home composting specifically. While composting is certainly an important component of urban agriculture, it is less extensive and intensive than other activities when used non-commercially.

- **Season extenders** for non-commercial use include cold frames, hoop houses or high tunnels, and occasionally greenhouses. All season extenders excluding greenhouses utilize passive solar heating, which means they require no additional heating or ventilation systems (DeLong, 2001). Most of these season extenders don't require permanent foundations, but they can still be large structures. Communities that allow season extenders thus display a willingness to allow for urban agriculture despite potential aesthetic concerns.

Motivation scores

The motivation scores were adapted from questions in the survey based on a 5 point Likert-type scale. In total, the survey tested 19 Likert items testing the importance of different benefits or motivation of urban agriculture to the decision to adopt a policy. The items were adapted from a comprehensive literature review (Golden, 2013) that grouped urban agriculture benefits into three primary categories: culture, economic, and health. An additional category, environment, was also developed from existing literature. The literature rationale for each survey item can be found in Table 3-2. The sources provided are by no means exhaustive. A general description citing the benefits of urban agriculture was also provided in the literature review. The benefit of creating an aggregate score for survey items is that the underlying construct the items are testing can be better explained by grouping the items together. Since I

have so few cases for the cluster analysis, the reduced number of variables provides for a better analysis.

Table 3-2: Survey items & literature for motivation variables

Motivation Item	Literature
Economic	
Entrepreneurship opportunities	Bradley & Galt, 2013; Pudup, 2008
Job skills building	Blair, 2009; Krasny & Doyle, 2002; Lewis, 1994
Increased property values	Voicu & Been, 2008
Expansion of property rights	Schindler, 2012
Economic savings on food	Larsen & Gilliland, 2009
Social	
Educational opportunities	Kerton & Sinclair, 2009; Krasny & Doyle, 2002; Lawson, 2005
Cultural opportunities	Krasny & Doyle, 2002; Lawson, 2005; Lovell, 2010
Creating safe places	Bradley & Galt, 2013; Lawson, 2005
Aesthetics	Lawson, 2005
Community development	Battersby & Marshak, 2014; Ferris et al., 2001
Increased access to land for agricultural purposes	Patel, 1991
Health	
Increased fruit and vegetable consumption	Larsen & Gilliland, 2009; McCormack et al., 2010
Access to local food	Corrigan, 2011; Larsen & Gilliland, 2009; Macias, 2008
General well-being (mental health and physical activity)	Bellows et al., 2003; Saldivar-Tanaka & Krasny, 2004
Environment	
Managing storm water/green infrastructure	EPA 2014, Freshwater Society, 2013
Remediating toxic land	EPA, 2014

I grouped these items into aggregated variables by calculating the median of each category. The best way to aggregate data from Likert scales is a subject of much controversy (Field, 2009; Kinnear & Gray, 2008). I chose the median as the statistic for central tendency because I did not find my Likert scale to be interval data, where the mean is typically used. Many researchers assume that Likert items can be treated like interval data based on a scale

measuring attitudes; however, recent literature suggests that the median may be the more appropriate statistic (Allen & Seaman, 2007; Gardner & Martin, 2007).

My research measured variables based on importance or involvement. The scale ranged from “no influence/not considered” to “very high influence”. Most verbal descriptors for Likert scales range from one extreme of the spectrum to another (i.e. “strongly disagree” to “strongly agree”). The assumption for these scales is that a move from one descriptor to another is the same for all points on the scale. Since my scale is not based on these extremes, but rather starts from absence of influence to high influence (or importance) I cannot trust the scale to be measured at interval level. Therefore I use the median as the proper descriptor of central tendency for ordinal data. Additionally, I found the median statistic to provide the most variability between groups. Aggregated Likert data using the mean can reduce variability, thus masking what the data is actually showing (Gardner & Martin, 2007). Other variables generated from the survey are used to further describe clusters. These data were also calculated by finding cluster medians.

Validity and reliability of motivation scores

I tested the reliability of the aggregated variables using Cronbach’s alpha. This test is often used to measure the internal consistency of grouped Likert items. A Cronbach’s alpha of 0.70 is generally sufficient (Desselle, 2005). I used literature and Cronbach’s alpha as a guide for creating the aggregated variables rather than conducting a factor analysis. The sample size for

this study was very small ($n=34$), and several sources have stated that a factor analysis requires a minimum sample size of 100 (Gorsuch, 1983; Kline, 1979).

All subcategories except environment had a Cronbach's alpha above 0.70. Environment had a Cronbach's alpha of 0.672, which is just under the limit. I retained the subcategory because the reliability is sufficient enough. The low score could be due to the small number of items included to create the variable. The other variables ranged from a score of 0.757 to 0.884 (Table 3-3). This indicates strong reliability for the other subcategories.

Table 3-3: Cronbach's alpha for motivation variables

Motivation category	Cronbach's Alpha	N of Items
Culture	.820	6
Economic	.757	5
Health	.884	3
Environment	.672	2

Selection of clustering method

After determining the appropriate variables for a cluster analysis, the next step is to choose the appropriate method for clustering. Emphasized is the need to obtain a solution that provides the most practical results in relation to the research question.

I utilized the two-step cluster analysis, which is a relatively new procedure developed for IBM's statistical software package (SPSS). This method has several advantages over other methods of cluster analysis, most notably that it can handle differently scaled variables and doesn't require that data be at the interval or ration level (Bacher, Wenzig, & Vogler, 2004; Mooi & Sarstedt, 2011). This method of cluster analysis works well for both continuous and categorical data. The method works by first forming "preclusters" which help to sort data with

many entries. Next, the “preclusters” are clustered using a hierarchical clustering algorithm (Norusis, 2012). To perform the cluster analysis I input the weighted ordinance scores and the motivation variables. Log-likelihood was used as the distance measure.

Next, an appropriate cluster solution was determined. There are no set rules for determining the correct number of clusters, however, several guidelines can direct the researcher in choosing an appropriate solution. The goal of the analysis should also be taken into consideration when considering the final solution.

The two-step method provides the ability to preselect the resulting number of clusters or to let the model decide the appropriate number of clusters. In order to select the appropriate number I ran a cluster using the two-step method and allowing the program to decide the number of clusters using Akaike’s Information Criterion (AIC) and Bayes Information Criterion (BIC). Both criteria resulted in a two cluster solution. The issue with these solutions is that clusters are separated by HH and LL, with high motivation and high adoption and low motivation and low adoption. This solution would not provide much explanation for differences in how urban agriculture arose in different communities.

Other studies using the two-step method have used hierarchical clustering first to determine the correct number of clusters and provide further validation of the cluster solution (Facca & Allen, 2011). I ran a hierarchical cluster using between groups for the average linkage and Euclidian squared for the distance measure. The resulting dendrogram suggested either a two or four cluster solution was feasible. Other tests used to validate the cluster solution for this variation included a fusion plot that shows loss of information with each new cluster

added. This statistic suggested either a four or five cluster solution. The pseudo t-squared statistic showed a jump at stage 3, which means four clusters are the appropriate solution. Finally, the pseudo f-statistic also suggested four clusters was an appropriate solution. I used the four cluster solution, then, as the preset number of clusters for the cluster analysis.

Determining validity of cluster solution

In the two-step cluster method, the statistic measuring the quality of the cluster solution is called the silhouette coefficient. The silhouette coefficient measures cohesion and separation of the clusters. It is calculated for each case as the “difference between the smallest average between cluster distance and the average within cluster distance, divided by the larger of the two distances” (Norusis, 2012). The coefficient for the cluster solution is the average of each case coefficient. The coefficient ranges from -1 to 1. Both the two and four-cluster solution had a silhouette coefficient just below 0.5, indicating a fairly good cluster model.

MANOVA Procedure

A multivariate analysis of variance (MANOVA) analysis can also be used as a measure of external validity for cluster solutions. In addition, I use the analysis to determine differences between clusters on selected independent variables to explain differences in ordinance adoption. MANOVA is used to test whether there are significant differences in means by comparing multiple dependent variables on multiple independent variables; in this case, the four clusters on internal socioeconomic and governmental variables. Relevant variables were drawn from policy adoption literature. As with most statistical tests, a large enough sample size

is required to create a robust analysis. At minimum, the number of independent variables should not outnumber the sample size (Foster, Barkus, & Yavorsky, 2006).

I used least squares difference (LSD) as a post hoc method for pairwise comparison of the clusters. LSD, the least strict of post hoc tests, only performs a series of t-tests after the null hypothesis has been rejected (Foster et al., 2006).

Expected Findings

The goal of this research is to determine differences in how urban agriculture is treated by different municipalities based on the types of ordinances adopted and the primary motivations for adoption. I used a cluster analysis as an appropriate statistical tool to create distinct groups of municipalities.

I further tease out the relationships between clusters by describing the clusters based on additional data collected from the survey sent to planning directors and from socioeconomic data obtained from the United States Census Bureau. This analysis can provide greater support to my original description of the cluster solution, but can also help to test whether similar variables predict ordinance adoption as hypothesized in other research. The results from this analysis will be presented in the next section.

CHAPTER IV.

RESULTS

In this chapter, I present the results of the cluster analysis, survey data, and comparison of socioeconomic variables as explained in the methodology chapter. The cluster analysis was formed to assess the relationship between motivations for urban agriculture and the variation in the types of urban agriculture ordinances adopted. I hope to answer why some types of urban agriculture are favored over others in different municipal contexts.

The results from the urban agriculture ordinance survey are summarized in a profile of each cluster. I also interpret the significance of socioeconomic variables across clusters using a multivariate analysis of variance model. Socioeconomic variables that are not significant for comparison of clusters are still provided to present a clearer picture of each cluster.

Cluster Results

The objective of the cluster analysis was to group the 34 participant municipalities into clusters by levels of ordinance adoption and attendant motivations for adoption of urban agriculture ordinances. The variables for the cluster analysis were ordinance scores and motivation scores measured using the survey instrument described in the previous methodology chapter. The method I used to identify clusters was the 2-step cluster analysis in SPSS.

The cluster analysis yielded four groups. Membership between clusters was evenly distributed. Cluster 1 contained 6 cases (17.6%), cluster 2 had 10 cases (29.2%), cluster 3 had 11

cases (32.4%), and cluster 4 was comprised of 7 cases (20.6%). An initial breakdown of the clusters is presented in Figure 4-1; these scores are based on a z-score of the variable means. Values around 0 denote the average response. Values closer to 1 indicate a stronger response, while values close to -1 indicate the variable is comparatively weak for that cluster.

The results from the standardized scores show two clusters with below average or average characteristics. The other clusters have stronger scores, but differ on what variables are strongest for the cluster. Clusters were given names using general characteristics from this table and from group influence scores presented later in Figure 4-2. Cluster 1 is referred to as “Reluctant Revisers.” Cluster 2 and 3 are named “Backyard Bargainers” and “Community Collaborators,” respectively. Cluster 4 is referred to as “Powerhouse Planners.” Rationale for naming of the clusters will be made evident in the following analysis of each cluster.

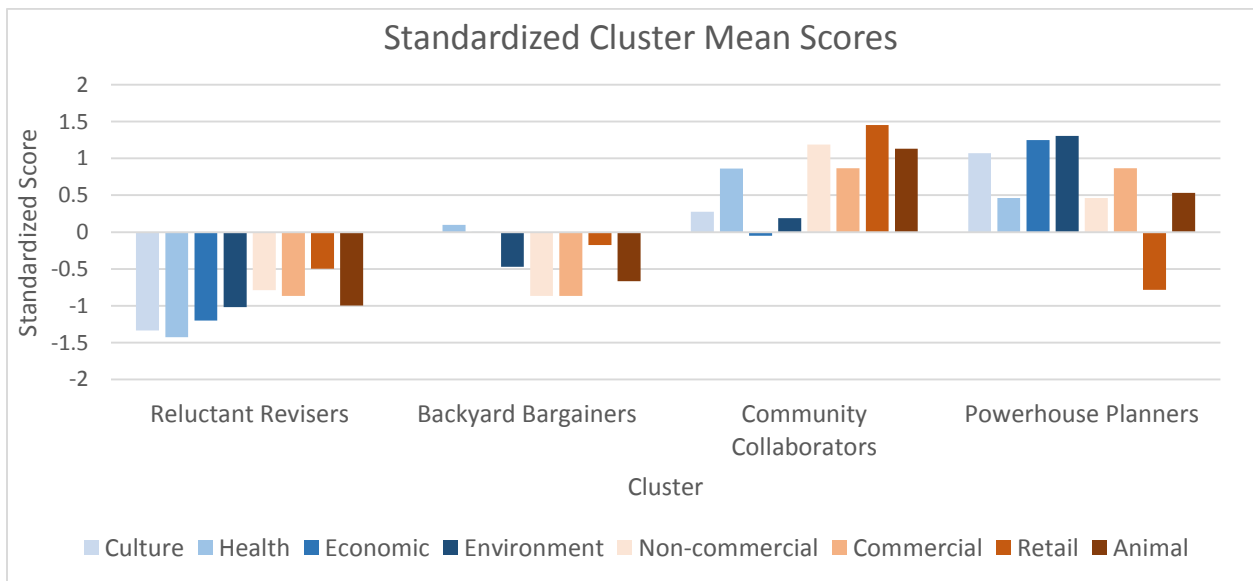


Figure 4-1: Cluster analysis standardized scores

Importance was used as an evaluative variable when first describing the clusters. I present it here to convey the consistency with the relative importance of urban agriculture to each cluster and the resulting ordinance and motivation scores (Figure 4-2).

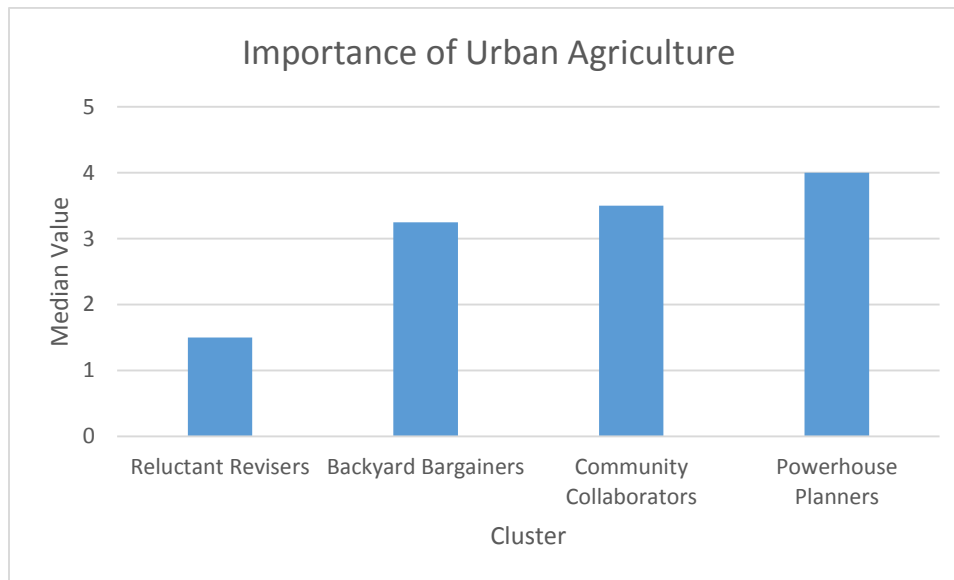


Figure 4-2: Importance score by cluster

Importance scores reflect increasing engagement with urban agriculture. Reluctant Revisers have the lowest score at 1.58 (on a 1-5 point Likert scale). Backyard Bargainers have a score of 3.25. Community Collaborators are the next highest at 3.5, followed by Powerhouse Planners with a fairly high overall score of 4.

Cluster 1: Reluctant Revisers

The first cluster resulted in a group with low ordinance and motivation scores. Six cases were included in this cluster: Sacramento, CA; Sioux Falls, SD; Tuscaloosa, AL; Hagerstown, MD; St. Charles, IL; and Staunton, VA. Cities are distributed throughout the country. It is likely that

this cluster could represent any number of cities in the United States that have not considered code changes relating to urban agriculture.



Figure 4-3: Cities in Reluctant Revisers cluster

This cluster is the least engaged in urban agriculture due to the lackluster overall scores. The importance of urban agriculture to this cluster was only 1.58 on a scale of 1-5. The highest ordinance score is for retail activities. Commercial activities have the lowest score in this cluster. The motivations scores for this cluster are similarly low. Health is marginally the highest motivation score for this cluster.

Cluster 2: Backyard Bargainers

The second cluster generated in this analysis includes ten cases. The cities included in this cluster are Council Bluffs, IA; Fort Collins, CO; Greensboro, NC; Harrisonburg, VA; San Diego, CA; San Francisco, CA; South Windsor, CT; Warrensburg, MO; Billings, MT; and St. Petersburg, FL.



Figure 4-4: Cities in Backyard Bargainers cluster

This cluster has the second lowest in importance and has relatively lower overall scores. This cluster may be considered average in regards to engagement with urban agriculture. In terms of ordinance scores, this cluster mirrors the ranking from highest to lowest scores as Reluctant Revisers, only with relatively higher scores. Retail is the highest score in this cluster. Animal agriculture is the second highest ordinance score. Beyond that, scores drop to Reluctant Reviser levels. Non-commercial scores are even lower than for Reluctant Revisers and commercial scores are tied.

Motivation scores follow a similar pattern to Reluctant Revisers: health highest, followed by similar scores for commercial and non-commercial, with environmental motivations receiving the lowest score. The economic motivation score for this cluster is slightly higher than in the Community Collaborators cluster.

Cluster 3: Community Collaborators

This cluster contains eleven cases, the largest number of cases among all the clusters. The cities present in this cluster include: Chapel Hill, NC; Iowa City, IA; Peoria, IL; St Paul, MN; Topeka, KS; Fayetteville, AR; Lawrence, KS; Philadelphia, PA; Rochester, MN; Salem, OR; and Sioux City, IA.



Figure 4-5: Cities in Community Collaborators cluster

This cluster ranks as the second most engaged with urban agriculture measured by the importance variable. This cluster is the most engaged with urban agriculture by ordinance scores, but has modest motivation scores. Ordinance adoption scores for animal, retail, and

non-commercial activities are highest in this cluster compared to the others. Commercial scores are tied with Powerhouse Planners. The retail score is the overall highest score within the cluster. Non-commercial and commercial scores are tied.

This cluster has the highest motivation score within and between clusters for health. Culture is the second most important motivation to this cluster. Environment scores are just above average and economic motivation is just below average. All other motivation scores are average, so while ordinance adoption is high, motivations for adoption are lower.

Cluster 4: Powerhouse Planners

Cluster 4 is one of the smaller clusters comprised of seven cases. The cities contained in this cluster include: Chicago, IL; Evanston, IL; Minneapolis, MN; Orlando, FL; Pittsburgh, PA; Milwaukee, WI; and Toledo, OH.



Figure 4-6: Cities in Powerhouse Planners cluster

This cluster ranks as the most engaged cluster with urban agriculture considering the importance and motivation variables. However, the cluster has lower overall ordinance scores, especially compared to Community Collaborators. Compared to all the clusters, this cluster had the lowest retail score. It also has a lower animal and non-commercial score than Powerhouse Planners. As mentioned previously, the commercial score is tied for this cluster and for Powerhouse Planners.

Motivation scores are very high for this cluster. This cluster has the highest culture, economic, and environment motivations between clusters. Health is the highest score within the cluster. Culture and economic scores are slightly lower. As with all the other clusters, the environment motivation is the lowest within the cluster.

Group Influence

The previous section analyzed the results from the cluster analysis. The ordinance and motivation scores were presented since they were the independent variables input into the cluster analysis model. The “Importance” variable was also presented; this variable was included in the cluster analysis as an evaluative variable and did not influence the formation of the clusters. The following section presents the rest of the survey results to further define the clusters. These questions were also based on a 5-point Likert scale. The scale ranged from “No influence/not considered” to “very high influence.” Cases were grouped depending on what cluster they fit into and the median was calculated for each variable.

The scores for group influence were based on seven survey items and aggregated into three primary group influences: government entities, non-profits/interest groups, and residents or groups of residents. City council members, planning staff, and a planning commission were combined to create the government entities group; non-profits generally, business interest groups, educational institutions and religious groups composed the non-profits/interest group category; and residents/groups of residents was its own category. These individual groups were created from the discussion on a framework for ordinance adoption in the literature review.

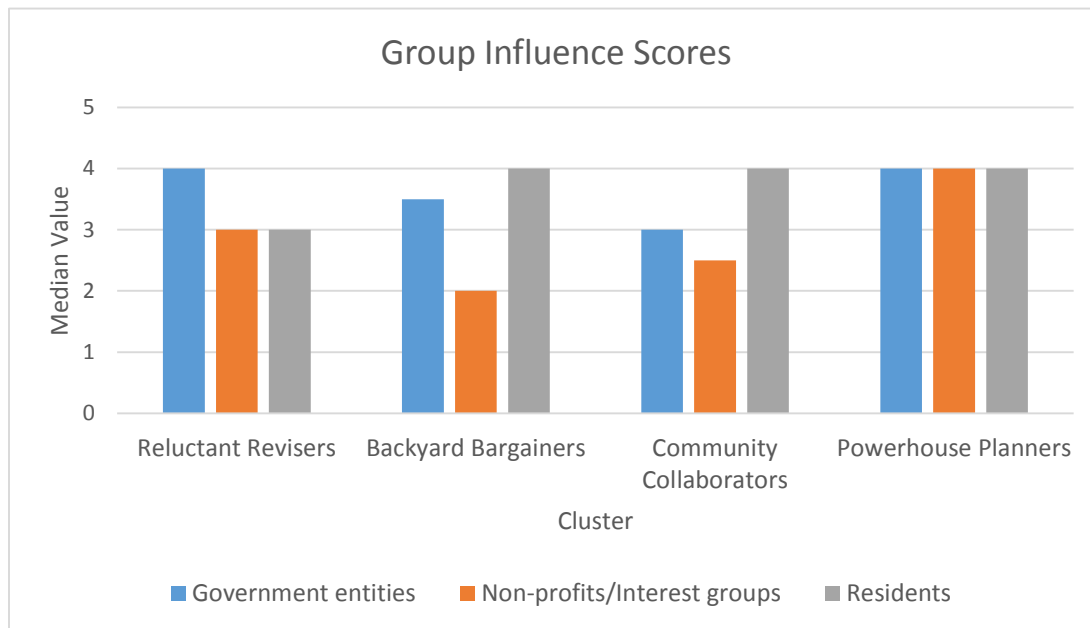


Figure 4-7: Group Influence by cluster

The survey question on group influence measured how influential different groups were for initiating the adoption of urban agriculture ordinances. Reported levels of influence were relatively high for Reluctant Revisers. The groups with the most influence in this cluster were government entities. The remaining groups had a moderate influence in the adoption of ordinances for this cluster.

Backyard Bargainers had the most influence from residents. Government entities had moderate influence, whereas the other groups little influence. Respondents also had a choice to provide additional groups they felt influenced their decision to adopt urban agriculture ordinances. Sioux Falls, South Dakota also noted that their farmers union and media provided moderate to high influence, respectively.

Community Collaborators had a similar profile for group influence as Backyard Bargainers. Residents played the biggest role, followed by government entities. Non-profits were more important in this group than for Backyard Bargainers. Many respondents in this cluster provided additional group influences. These additional groups, with the exception of one, are all organized around food, community, or environmental concerns. Non-profit groups in this cluster are thus organized around broader interests than specific-interest groups of Backyard Bargainers. Only Lawrence, Kansas mentioned a general governmental group, the Board of County Commissioners, as a highly influential additional group influence. Topeka, Kansas said its State Extension Office provided a very highly influential role. Philadelphia, Pennsylvania did not provide a ranking, but noted that "food access organizations" were a group influence. St. Paul, Minnesota stated that the county food commission had very high influence in their decision to adopt these ordinances. Finally, Iowa City, Iowa mentioned "local food groups" as highly influential and "environmental groups" as having moderate influence on the decision to adopt urban agriculture ordinances.

The final cluster, Powerhouse Planners, has the highest overall levels of influence for all groups. Chicago, Illinois and Milwaukee, Wisconsin said the mayor had very high group

influence. Orlando, Florida noted that a “food policy council” provided moderate group influence.

Participation, Complaints, Downsides to Urban Agriculture

The participation question in the survey asked whether the respondent noticed difference in residents’ involvement in urban agriculture activities after the adoption of urban agriculture ordinances. About three-quarters of respondents, 74%, said participation was somewhat higher or much higher. 24% said there was no change, and only one respondent, or 3%, said participation was much lower.

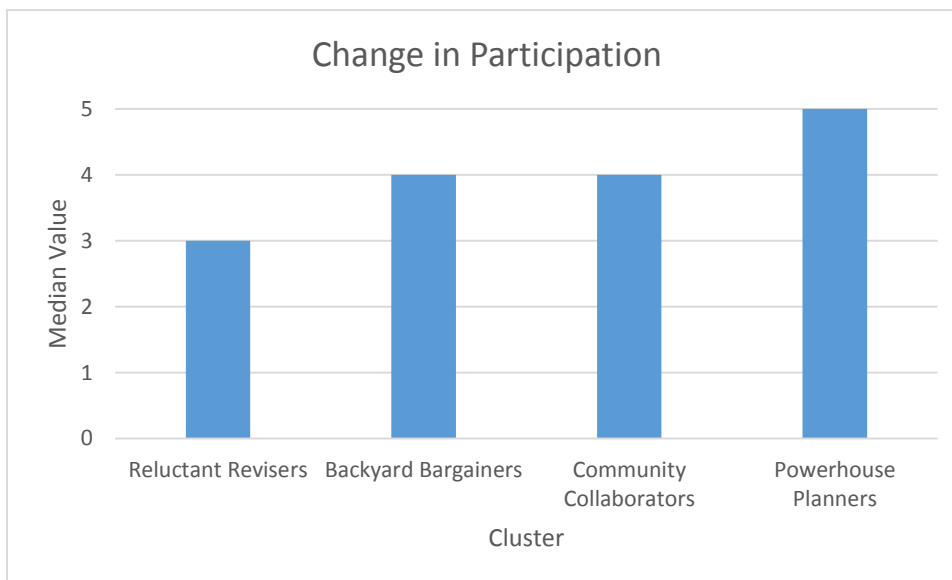


Figure 4-8: Change in participation after adoption of urban agriculture ordinances

A similar picture to the overall frequency emerges when broken down by cluster, as shown in Figure 4-8. Reluctant Revisers, the least engaged cluster, had a median score of 3, or no change, in regards to participation in urban agriculture. Both Backyard Bargainers and

Community Collaborators had somewhat higher participation. Powerhouse Planners observed much higher participation in urban agriculture after the adoption of new ordinances.

The survey also asked whether there was a change in the number of complaints a city received after the adoption of urban agriculture ordinances. Most of the respondents (76%) found no change. 12% saw somewhat fewer complaints, while 12% received somewhat more complaints. This question was also sorted by cluster. All clusters had a median of 3, meaning there was no change in the number of complaints.

Complaints could be linked to different downsides associated with urban agriculture. Nuisance issues like poor aesthetics, noise, odor and pests are all potential problems. Other issues that arise alongside the practice of urban agriculture include parking and traffic issues when the activity involves people coming to the site to work or purchase produce. Economic concerns include the loss of land for development or the potential for a reduction in property values if the use is perceived to be nuisance-like. Food safety concerns are a final issue, especially if these products are being consumed by someone other than the producer. Figure 4-9 provides the median Likert scale values broken down by cluster. Again, these values range on a 5-point scale from “no influence/not considered” to “very high influence.”

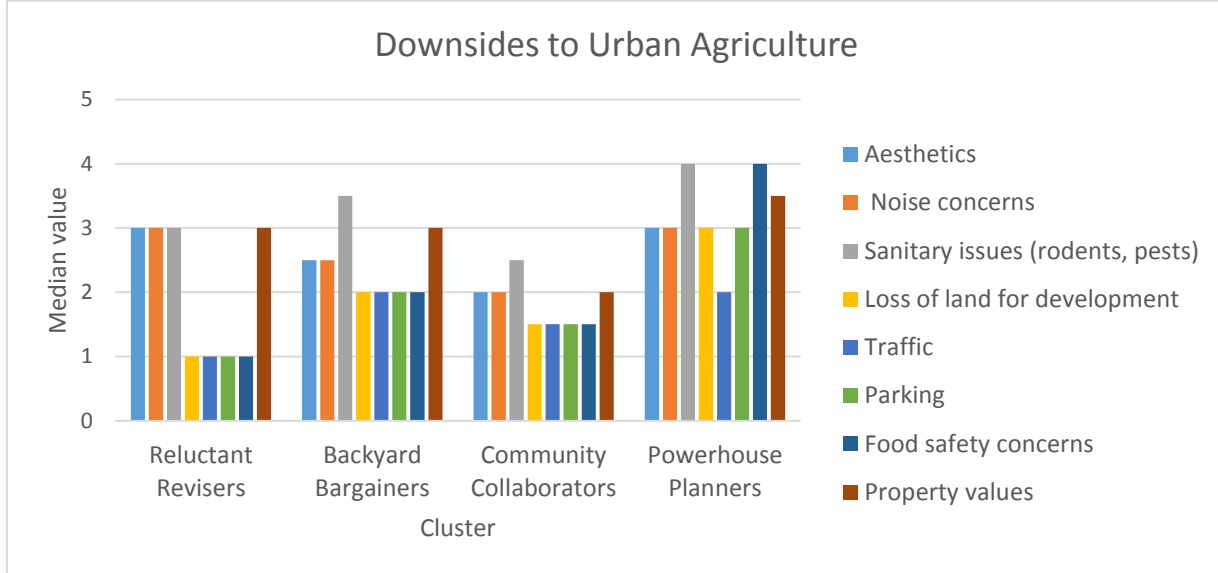


Figure 4-9: Downsides to urban agriculture by cluster

All factors for Reluctant Revisers were of moderate or lower interest. Aesthetics, noise concerns, sanitary issues, and property values were the highest concerns within this cluster. Loss of land for development, traffic, parking, and food safety concerns were of low influence. Individual respondents also mentioned other downsides for urban agriculture. Hagerstown, Maryland found “irresponsible animal husbandry” to be a very important deterrent to urban agriculture ordinance adoption. Staunton, Virginia noted that “keeping an agricultural tax rate” was a downside to implementing these practices.

Backyard Bargainers had generally higher scores across the board than Reluctant Revisers. Here, sanitary issues were of the greatest concern within the cluster with a score of 3.5. Property values were the next highest influence in the cluster. The final six factors all received scores below 2.5 and were of little influence to this cluster. In terms of additional

factors, Fort Collins, Colorado listed “chemical use” as a highly influential downside to urban agriculture.

The cluster with the highest ordinance adoption, Community Collaborators, presented the lowest overall median scores for downsides to urban agriculture. Sanitary issues received the highest score of 2.5. Aesthetics, noise concerns, and property values follow with a score of 2, or low influence. No respondents in this cluster provided additional downsides to urban agriculture.

Powerhouse Planners showed the highest overall scores for downsides to urban agriculture. Remember that this cluster also had the highest scores for positive motivations. Sanitary issues and food safety concerns were both of high importance in this cluster. Property values trailed close behind with a score of 3.5. All other scores are of moderate influence, excepting traffic which is ranked as low influence. Chicago, Illinois mentioned “odor” as a highly influential downside, while Orlando, Florida cited a “change in neighborhood function/characteristics” as an unranked downside.

Informational Materials

The survey asked respondents if the municipality provided informational materials on ordinances or best practices associated with urban agriculture activities. Beyond simply implementing zoning ordinances, this question tests if municipalities are engaged with urban

agriculture by providing residents with the means to understand ordinances and how best to perform agriculture activities in urban environments.

Overall, about half (48.5%) of municipalities did provide information on urban agriculture ordinances. The opposite is seen for materials relating to best practices for urban agriculture, where only 36.4% of municipalities have informational materials on this subject. The inverse is also seen for “no” responses-for ordinances, 33.3% of municipalities do not have materials, whereas 48.5% do not have materials on best practices. For both questions, about 20% of respondents are unsure if their municipality provides informational materials. No major differences emerged when broken down by cluster.

Significant Socioeconomic Characteristics

Means and standard deviations were calculated for twelve variables. A MANOVA was used to test effects of multiple independent variables on clusters. Data was obtained from the U.S. Census Bureau and American Community Survey. All data are ACS data for 2009-2013 unless otherwise noted. Government data, including government type and number of code enforcement employees, was obtained from the survey. Although there are five primary forms of municipal government included in the survey, respondents only fell within one of two categories: Council-Manager and Mayor-Council.

A MANOVA was run to test for differences of independent variables, internal characteristics of municipality, on the dependent cluster variable. Results showed no statistical

significance for the model as a whole or for individual variables; however, significance was found in a comparison between clusters.

The Least Squares Difference (LSD) post hoc output was used to identify significant differences between clusters in Table 4-3. I determined significance using a p-value of .1. While .05 is usually presented, and is differentiated here to show more robust results, the higher p-value was used to expand the number of variables with potential significance to the study. Since this is an exploratory study, conservative p-values are not necessary (Reese, 2004).

Table 4-3: Independent variables with between cluster significance

Independent Variable	Reference Cluster	Reference Cluster Mean	Comparison Cluster	Comparison Cluster Mean	Sig.
Population	Reluctant Revisers	139653	Backyard Bargainers	314279	.539
			Community Collaborators	249733	.693
			Powerhouse Planners	662460	.094*
Pop/Sqmi	Reluctant Revisers	2531	Backyard Bargainers	3972	.426
			Community Collaborators	3400	.624
			Powerhouse Planners	6585	.044**
% White	Powerhouse Planners	51.10	Reluctant Revisers	68.66	.064*
			Backyard Bargainers	69.17	.033**
			Community Collaborators	68.65	.035**
Median home value	Backyard Bargainers	264020	Reluctant Revisers	190800	.260
			Community Collaborators	171563	.097*
			Powerhouse Planners	180100	.178
Mayor-Council	Backyard Bargainers	1.4	Reluctant Revisers	1.5	.697
			Community Collaborators	1.64	.282
			Powerhouse Planners	1.86	.070*

Based on estimated marginal means *Sig at .1

**Sig at .05

Population and population density (population per square mile) are only significant comparing Reluctant Revisers to Powerhouse Planners. The Powerhouse Planners cluster has greater population density and is much larger than the mean city in the Reluctant Reviser cluster. Percent white, non-Hispanic population is significant when comparing all clusters to Powerhouse Planners. The Powerhouse Planner cluster is significantly more diverse than all other clusters. Home values are somewhat significant between Backyard Bargainers and Community Collaborators, while home values are significantly higher for the Backyard Bargainer cluster than for Community Collaborators. Government type is somewhat significant comparing Backyard Bargainers to Powerhouse Planners. Powerhouse Planners were primarily Mayor-Council forms of government, whereas Backyard Bargainers were primarily under the Council Manager form of government.

Summary of Study Results

A four cluster solution was created based on ordinance and motivation variables. The result produced two groups that are relatively low on both ordinance and motivation variables. The other two clusters are high on one set of variables and average on the other (i.e. high ordinance adoption, but average motivation).

The clusters were further explored by examining variables obtained from the survey to determine which groups influenced adoption, what the primary downsides to urban agriculture were, if participation or complaints relating to urban agriculture changed after ordinance adoption, and if materials were provided to help residents better understand ordinances and

best practices for urban agriculture activities. In low clusters, government agencies were primarily responsible for initiating adoption of urban agriculture ordinances. In higher clusters, government agencies, non-profits, and individuals all played a large role. Participation and complaints were about the same after ordinance adoption. For most clusters, the primary downsides to urban agriculture according to planning directors were sanitation issues and property values. Lastly, municipalities were more likely to have informational materials on ordinances relating to urban agriculture than information on best practices for performing the activity.

Information on social, economic, government, and land characteristics was also assessed for each cluster. The clusters that were least engaged in urban agriculture primarily had Council-Manager forms of government, compared to the higher engaged clusters with Mayor-Council forms of government. Low adoption and motivation clusters were wealthier and had lower rates of poverty, whereas high scoring clusters were less wealthy and somewhat more diverse.

CHAPTER V.

SUMMARY & CONCLUSION

This section reintroduces urban agriculture as a tool to either reinforce or alter neoliberal structures. I also investigate who benefits from planning for urban agriculture seems to benefit. This inquiry addresses whether urban agriculture is truly being used for just social ends, or if it has been coopted as a form of neoliberal urbanism. I further explore internal factors that support ordinance adoption.

Review of Clusters within Theoretical Framework

Reluctant Revisers

Reluctant Revisers neither adopted many ordinances nor had high motivations or interest in urban agriculture. These municipalities are representative of the many localities that have not engaged with urban agriculture either because the issue has never arisen or the government refuses to acknowledge urban agriculture as a valid form of municipal land use.

The respondent cities in the Reluctant Reviser cluster primarily relied on government entities to draft policies. Unlike the other clusters, this cluster did not rank any group below “moderate influence.” These are interesting results to explore further, since the reliance on various government entities as a group influence seems to prevent policies from being adopted in these municipalities.

The municipalities that rely on government influence to adopt urban agriculture ordinances may still have local groups that attempt to influence adoption. Their efforts just may not be successful. Take the climate in Staunton, Virginia as an example; their story is a common one. A group of residents advocated for allowing chickens in Staunton. In an article addressing the chicken debate, Timothy Hartless, a city planner in Staunton at the time, remarked "Our [Staunton's] goal is to protect property values, quality of life and public health in the city and those are all endangered because chickens are farm animals" (Knupp, 2014, September 13). Despite the best efforts of the community, Staunton's planning department did not find the justifications for the use to outweigh the potential downsides.

Still other cities may not adopt ordinances because those in the local government don't perceive there to be a strong desire from residents to participate in urban agriculture. Tuscaloosa seemed to have more policies than other municipalities in this cluster, however, these policies were largely part of the original code in 1972. The survey respondent provided additional context to the situation in Tuscaloosa:

Tuscaloosa has had very little to do with urban ag since it has been a major part of southern economics since the beginning. We do very little to govern personal ag due to the fact that very few people are participating. Some of the schools participate in a program that teaches organic gardening, but the majority of people that have personal farms live outside of the city limits where it is completely unregulated....Land values and food prices are low in our area and those that wish to grow their own food run into very little red tape.

Since the municipalities in this cluster are less dense and have smaller populations than the other clusters, they may not perceive urban agriculture to be a use that residents are

interested in. Those that wish to participate in agricultural activities are assumed to reside outside of city limits where these practices are allowed.

Backyard Bargainers

Backyard Bargainers have average health and culture motivations. The items that made up the health motivation category were oriented to meet individual needs. Health motivations included access to fresh food, increased personal fruit and vegetable consumption, and increase in overall well-being. Health motivations seemed to be strongly linked to retail activities in all clusters. Retail activities like farmers' markets and food trucks are obvious solutions to provide individuals with greater access to fresh food.

The Backyard Bargainers cluster seems to primarily include cities that emphasize urban agriculture due to individuals' efforts to allow specific uses. The primary ordinances adopted in these municipalities allow retail and animal uses. Health and culture are the primary motivations. Other variables that further describe this cluster show the importance of individual action. City engagement with urban agriculture was primarily influenced by the desires of small groups of active citizens. In this case, individuals likely formed interest groups around allowing a specific use. A council member may have advocated for (or against) allowing the use. Urban agriculture was not a priority for planners or the planning commission and thus larger planning efforts were not embarked upon for most cities in this cluster.

Backyard Bargainers are concerned about sanitation and loss of property values as downsides to urban agriculture, corresponding to the likelihood that these communities

primarily dealt with citizens looking to practice activities like raising chickens or livestock in residential areas. Noise and aesthetics are also some of the higher ranked downsides to urban agriculture for this cluster. These nuisance-like issues are usually a problem in residential areas, corresponding to the general concern about property devaluation.

Community Collaborators

Community collaborators are explicit in their support for urban agriculture to improve health and provide community benefits. Home agriculture and non-commercial activities, like raising animals, composting, and growing food in unique places such as the front-yard or rooftop are emphasized. Economic activities are still allowed, but there is less financial and programmatic support for these activities (Stutzer, 2014, April 25).

Many of the municipalities in the Community Collaborators cluster are dealing with a glut of vacant land from the effects of deindustrialization and widespread disinvestment. Here, urban agriculture is seen as a strategy to address vacant lots (Kaufman & Bailkey, 2000; Travaline & Hunold, 2010). However, unlike many of the cities in the Powerhouse Planner cluster, cities in this cluster are hoping to use these lands for community gardening or as spaces for individuals and non-profits to produce food.

Ordinances were typically adopted much earlier than for Powerhouse Planners, and several respondents remarked that they had traditionally allowed non-commercial urban agriculture uses without explicit regulation for many years. According to the respondent for Iowa City, the city only allows non-commercial gardening on vacant lots. The respondent for

Peoria, Illinois stated that the excess of vacant land can be used in the short- or long-term “depending on the needs of the community.” Salem, Oregon has traditionally allowed many forms of crop agriculture for community purposes. The respondent also mentioned the city has allowed beekeeping without restriction as long as the use is non-commercial. These attitudes may bring less financial support from the city, but residents are given leeway to practice different forms of food provisioning without burdensome regulation.

The influence of outside groups and informal networks involved in urban agriculture to Philadelphia, Pennsylvania’s decision to adopt ordinances is evidenced by the context provided by the survey respondent:

We had a movement of community gardens, CSAs, agriculture growing, farmers markets, and we added on our priority of Food Access and reducing Food Deserts prior to rewriting our Zoning Code in 2012. These were priorities and we put them in the Code overall and not just one section. We encourage food access in almost every zoning district.

The survey respondent for Topeka, Kansas indicated that the municipality worked with “a community group, individuals, and our Extension Agency to draft the definition, and permit requirements for a ‘community garden.’” Philadelphia, Rochester, and other municipalities discussed above also relied on community groups to inform ordinance language. The reliance on informal networks and community groups could explain the higher levels of ordinance adoption. Unlike Backyard Bargainers, the groups involved in these cities pushed for a comprehensive approach to urban agriculture. These informal groups are generally action-oriented. Many of these groups make recommendations for code changes and provide cities

with draft ordinances. The adoption of zoning ordinances would be a tangible result showing these networks were successful in their efforts.

Powerhouse Planners

Powerhouse Planners only had comparable commercial ordinance scores to Community Collaborators. Retail and non-commercial scores were much lower than in Community Collaborator cluster, although still above baseline. Interestingly, retail scores were the lowest in this cluster compared to all clusters. While all motivations were high for this cluster, the primary drivers were for economic and environmental benefits. The cities in these clusters embarked on serious planning processes to support urban agriculture. Many of these efforts were also in response to a glut of vacant land, since a good fraction of the cities in this cluster are part of the “rust belt” area, including Chicago, Milwaukee, Evanston, Toledo, and Pittsburgh (Czerniak, 2012). The retreat of manufacturing industries in these areas left a surplus of vacant land in their wake. Urban agriculture is seen in these cities not primarily as a way to provide food, but more as an instrument for market support. Urban agriculture is also used to support sustainability efforts, which would explain the links between environmental and economic motivators.

The link between economic and environmental motivations provides more insight into how cities are using urban agriculture for sustainable development goals. The environmental motivation was composed of factors that could only be addressed on city-wide basis, like green infrastructure and remediation of brownfields. Strategies specifically focusing on adaptation,

like green infrastructure, may be treated as a commodity used to bolster local economic production (Whitehead, 2013). Since Powerhouse Planners included many cities that initiated urban agriculture as a government project, it makes sense that this cluster would favor environmental goals that impact the city as a whole.

Powerhouse Planners ostensibly involved everyone in ordinance adoption. Steering committees include leaders of many interest groups, but are less likely to engage the larger community. These types of planning efforts usually draw from “grass tops” leadership, in contrast to the broader “grass roots” engagement in the Community Collaborator cluster. These larger organizations might push for more intensive urban agricultural uses, while cities would be interested in selectively promoting larger projects as part of a set of “sustainable development” goals (Tornaghi, 2014).

The rationale for allowing urban agriculture in Powerhouse Planner cities is undeniably market-oriented. Urban agriculture is seen as an economic development tool or a commodity used to attract talented demographics, much like the rush for cities to embrace diversity, arts and culture to attract a transient “creative class” (Florida, 2002). Peck argues creative cities are a “soft” policy fix; they allow for modest spending on creative assets, while raising middle class lifestyle elements to the equivalent of urban development objectives (2007, June 28). Urban agriculture could be used similarly. It attracts educated, entrepreneurial, aspiring urban farmers looking to live a meaningful, “sustainable” lifestyle. Although some cities traditionally thought to embody the “creative class” ideal, like San Francisco and San Diego in the Backyard

Bargainers cluster (Peck, 2005), might look to allow individual uses to attract residents, Powerhouse Planner cities ramp up policy efforts for urban agriculture as a city-led project.

Review of Characteristics Influencing Urban Agriculture Ordinance Adoption

I now shift to an examination of socioeconomic variables to see what characteristics exist in cities that are more likely to adopt urban agriculture ordinances. Although this research employed a unique methodology to study the influence of internal variables on municipal ordinance adoption, similar conclusions and insights can be drawn from this study as those found in other studies on the subject of local policy adoption.

Social characteristics

A larger, denser city seems more likely to adopt some urban agriculture ordinances, at least when comparing the lowest adopter group, Reluctant Revisers, to that with the highest levels of motivations and overall stronger planning efforts within the city, Powerhouse Planners. This is in line with previous research that found that population was a predictor for number of policies adopted (Hawkins, 2014; and Locke and Rissman, 2015; Meltzer and Schuetz, 2010).

Cities with more diverse populations may be more likely to adopt ordinances similar to those adopted by Powerhouse Planners. These diverse cities likely have greater competing interests and may face more barriers when attempting to include all types of community

members. These communities may opt to plan with a top-down approach, involving leaders of selected groups to be representative stakeholders.

Economic characteristics

Home values are significant between Backyard Bargainers and Community Collaborators, with Backyard Bargainers having much higher home values than Community Collaborators. Having low home values may encourage adoption of urban agriculture ordinances. Some communities might attempt to adopt urban agriculture in order to protect from the retreat of capital. This retreat may show up tangibly in the devaluation of home prices. Although no longitudinal economic data was tested, it could be inferred that lower home prices compared to other clusters may be associated with depressed economic conditions.

Previous policy adoption research has suggested that municipalities with higher incomes will be more likely to adopt a greater number of policies overall (Feiock and West, 1993). While income was not statistically significant, there are moderate differences in means between clusters. Backyard Bargainers have the highest median household income of \$54,026. Powerhouse Planners have the lowest median income of \$44,902, while Community Collaborators have a slightly higher median income of \$46,034. This shows a reverse trend than is typically hypothesized. Those clusters with lower median incomes were more likely to adopt urban agriculture ordinances.

Governmental characteristics

Most research hypothesizes that the Council-Manager form of local government is more likely to adopt policies, due to increased professionalization (Shipan and Voldan, 2008). I found the opposite trend for urban agriculture ordinance adoption. In this study, municipalities with a Mayor-Council form of government were more likely to embrace urban agriculture. In some cities, especially those in the Powerhouse Planner cluster, mayors were responsible for initiating planning efforts. This may be due to the fact that urban agriculture is used as a political project in economically struggling cities. In these cities, the popularity of urban agriculture can be taken advantage of by cities to temporarily utilize vacant lots and foster entrepreneurial development with little financial investment.

Although not significant, those clusters that had average or high ordinance adoption scores do have more code enforcement than those with low scores. Some threshold of administrative capacity likely must be met for a municipality to willingly allow more activities with the potential for nuisance-like characteristics.

Summary

In all clusters, urban agriculture is treated as a way to support healthy communities or bolster economic activity. Previous research theorized that urban agriculture is utilized either as a “protective countermovement” to the negative social impacts arising from unrestrained market economies or, in more direct service of the market, as a form of local economic development (McClintock, 2014). The differences between Community Collaborators and

Powerhouse Planners create a compelling picture of how urban agriculture can be used to meet different ends, even when the effort is in response to similar problems. While none of the responses could be said to be radically oriented, there was a suggestion that some cities did implement urban agriculture as a contestation to the deleterious social effects resulting from neoliberalization. A common thread running through all cities that had adopted extensive urban agriculture ordinances was the hope that urban farming and gardening efforts could be used to turn vacant lots into productive space. The primary difference between Community Collaborators and Powerhouse Planners on this issue was whether activities on vacant land should be primarily commercial or community-based. There is nothing wrong with commercial urban agriculture in and of itself, however, an overemphasis on using urban agriculture as a vehicle for economic development can divert investment and opportunities away from urban agriculture projects with social goals.

It seemed that initiatives that started outside of government coordination resulted in policies that were tailored to addressing urban social problems. Policies that stemmed from government initiation generally emphasized those activities that would further economic, often neoliberal goals. Although this orientation towards neoliberal goals seems condemning, it should be noted that there is still opportunity for activists to work within a favorable policy climate to meet more radical social ends. As Pudup affirms, “projects organized around urban agricultural activities that may be categorized as neoliberal may also actually serve as important rallying grounds for activists” (2008). Ordinances allowing for urban agriculture still give groups the flexibility to implement programs that can alleviate or challenge existing social and

economic conditions. These groups may use the rhetoric of market ideology in order to obtain funding, but may in reality have dramatically different motivations and goals than the municipality.

Here we should recall McClintock's exhortation to understand urban agriculture as both neoliberal and radical. Alternative visions of urbanism can still exist under neoliberal systems. These forms of contestation will likely reify parts of neoliberalism, but still offer hope for an alternative vision of the future (2014). Distrust of government and viewing regulation as ultimately compromising or coopting of radical social ends limits productive visions for just urban forms. Groups that advocate for just food systems often fail to criticize the role of capitalism in the production of unjust systems. They therefore focus on market-oriented solutions, instead of advocating for political change (Harper, Shattuck, Holt-Giménez, Alkon & Lambrick, 2009).

For planners, this should serve as a recommendation to solicit advice for urban agriculture ordinances from those groups and informal networks that are already working to utilize urban agriculture for social ends. Municipalities wishing to adopt or alter existing urban agriculture ordinances must consider whether the types of activities they are looking to adopt will meet the needs of community members. Often, non-profit groups must alter their strategies in order to secure funding from government agencies and other sources. If municipalities can tailor programs to existing needs, rather than for development agendas, these groups will be less likely to have to change their focus and "play the game" in order to secure funding (Pudup, 2008).

Limitations

One limitation to the research was a small sample size. While a low response rate is normal for administrative surveys, summer seemed like an especially poor time to conduct survey research since I received many responses noting that the potential participant would be out of the office for extended periods of time. Furthermore, I did not have access to a database with confirmed correct contact information and relied on internet searches to find a potential contact person. In many cases, I was only able to find information for a department, and not a specific individual. I would have had a better response rate if I had access to the appropriate contact information.

As with any quantitative statistical analysis, the design and implementation could have been more robust. The small sample size was one issue. It is difficult to assess generalizability when there were few participants. There also seemed to be discrepancies in how accurate individual respondents were in providing information on ordinance adoption. The ordinance score was assessed solely on responses for whether an ordinance was adopted or not. In a further analysis of individual communities, I found that some communities actually *did* have an ordinance for a specific activity that respondents stated they did not. In other cases, communities said they did have an ordinance, but I could not confirm if this was the case. Unfortunately, I could not verify all answers because some municipalities did not have the code available online. Future studies could include an analysis of municipal code to determine what urban agriculture activities are allowed, rather than testing adoption based on survey response.

Another limitation is the appropriateness of the method for cluster analysis, both the construction of the variables and the type of cluster analysis performed. The scores I assigned based on importance of the activity to an overall robust urban agriculture subcategory could be conceptualized differently. It may have been more appropriate to simply create the score based on presence/absence of an ordinance. For the cluster analysis, I could have used the more popular hierarchical clustering procedure since my sample size was small.

Future Work

With greater time and funding-the desire of any researcher-I would have liked to conduct a more extensive analysis on select municipalities from each cluster. A comparative case-study approach to this research would provide greater historical and contextual understanding of how urban agriculture arises in different environments. This would also provide a better avenue for qualitative research and could include interviews with planners and other officials involved with urban agriculture issues. Since most qualitative research has focused on those practicing urban agriculture, an expanded framework including urban elites both for and against urban agriculture could provide insight into competing motivations for adoption.

In a similar vein, it would be useful to expand the study to include other types of regulations in order to make sense of the larger policy environment in relation to urban agriculture. This could include an analysis of tax breaks, grants, and other financial incentives for urban agriculture. A different approach could be to study the influence of higher levels of

government on local policy. Several municipalities noted issues at the county or state level that could hinder or encourage urban agriculture. Municipalities that must align with county land use rules or state right-to-farm legislation may be wary of implementing urban agriculture.

Finally, an assumption of this research was that explicit regulation for urban agriculture activities would make it easier for residents to participate in these activities. In practice, this may not be the case. Ordinances can hinder urban agriculture activities for a variety of reasons, including prohibitive permitting fees, too large setback or lot size requirements, or overly restrictive locational regulations. Future research should test if these regulations actually do give residents greater freedom in practicing urban agriculture. This future work would continue to address the question of who is benefiting from municipal involvement in urban agriculture.

Conclusion

While the potential of municipal policy for urban agriculture is not fully realized (McClintock, 2014), this research seeks to further understand how urban agriculture can be used to create radical alternative forms of food production. Results from this study are encouraging in that some municipalities embrace urban agriculture for social reasons and this translates into support for a broader variety of urban agriculture ordinances. An ounce of caution is also warranted, as urban agriculture in other municipalities is entrenched in processes of neoliberalism. The orientation of the government allowing for these uses is important, since it may selectively support and fund certain projects or activities over others. It

is my hope that some of the findings in this research help planners and policy makers develop more thoughtful urban agriculture policy and programs with these contradictions in mind.

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APPENDIX A

URBAN AGRICULTURE ORDINANCE ADOPTION SURVEY

Q1 Please review the entire list first before responding. The survey will ask you to provide the reference to any ordinance your city has which explicitly allows the following uses. Do not include nuisance ordinances or general animal control ordinances.

	Adopted ordinance			If yes, ordinance reference Ordinance citation	Year Adopted Year Adopted
	Yes	Tried, but failed	Never attempted		
General urban agriculture ordinance (Allows for many urban agriculture activities in a pre-existing district)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Urban agriculture zoning district	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Chicken keeping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Bee keeping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Goats and other livestock	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Aquaculture (Raising of aquatic animals for food)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Hydroponics (Process of growing plants in water without soil)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Aquaponics (A combination of hydroponics and aquaculture)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Community gardens (Non-commercial)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Urban farms/CSAs (Commercial)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
CSA drop-off sites (Allowing shares of farm produce to be distributed at residential or institutional sites)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Farming on vacant lots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Farming in right-of-ways	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Front-yard gardening	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Rooftop gardening	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Composting (Home or small-scale composting operations, not commercial)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Season extenders (Hoophouses, coldframes or any other home or small-scale structure used to extend the growing season)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Commercial greenhouses for food production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Farmers markets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Food trucks/pushcarts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		

Q2 How important of an issue is urban agriculture in your community in general?

- Not Important
- Slightly Important
- Moderately Important
- Important
- Very Important

Q3 How important is allowing urban agriculture uses to the planning officials in your community?

- Not Important
- Slightly Important
- Moderately Important
- Important
- Highly Important

Q4 What level of influence did the following groups have for initiating the adoption of urban agriculture ordinances in your community?

	No influence/not considered	Low influence	Moderate influence	High Influence	Very High Influence
City council member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Planning staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Planning commission	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Non-profit group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Religious group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Business/business interest group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Educational institution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individual resident/group of residents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q5 How influential were the following factors in discussions over whether to adopt urban agriculture ordinances?

	No influence/not considered	Low influence	Moderate influence	High influence	Very high influence
Educational opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Entrepreneurship opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Job-skills building	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic savings on food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased fruit and vegetable consumption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to local food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
General well-being (mental health and physical activity)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creating safe places	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aesthetics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Expansion of property rights	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased property values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased access to land for agricultural purposes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing storm water/green infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Remediating toxic land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aesthetics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Noise concerns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sanitary issues (rodents, pests)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loss of land for development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Traffic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food safety concerns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q6 After adoption of urban agriculture ordinances, do you perceive there to be lower or higher participation in urban agriculture activities in your community?

- Much Lower
- Somewhat Lower
- No Change
- Somewhat High
- Much Higher

Q7 After adoption of urban agriculture ordinances, do you perceive there to be fewer or more complaints regarding urban agriculture activities in your community?

- Much Fewer
- Somewhat Fewer
- No Change
- Somewhat More
- Many More

Q8 Are there informational materials (pamphlets, websites, videos, etc) provided to the public about the specifics of these ordinances?

- Yes
- No
- Unsure

Q9 Are there informational materials (pamphlets, websites, videos, etc) provided to the public about best practices associated with urban agriculture activities?

- Yes
- No
- Unsure

Q10 What is the name of your jurisdiction?

City

State

Q11 How many staff members does your community have who are responsible for zoning code enforcement?

Q12 What is the form of your jurisdiction's municipal government?

- Council-Manager
- Mayor-Council
- Commission
- Town Meeting
- Representative Town Meeting

Q13 Additional comments or context for your community:

APPENDIX B

IRB APPROVAL FORM

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

Date: 3/30/2015

To: Andrea Vaage
1012 Ridgewood Ave Ames, 50010

CC: Dr. Gary D Taylor
286 College of Design
Kipp Paulsen
1012 Ridgewood Ave, Ames, IA 50010

From: Office for Responsible Research

Title: Urban Agriculture Landscapes: A review of municipalities which adopt urban agriculture ordinances

IRB ID: 15-181

Study Review Date: 3/19/2015

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

- (3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, and achievement), survey procedures, interview procedures, or observation of public behavior when
 - The human subjects are elected or appointed public officials or candidates for public office; or
 - Federal statute(s) requires without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

The determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. Changes to key personnel must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

Detailed information about requirements for submission of modifications can be found on the Exempt Study Modification Form. A Personnel Change Form may be submitted when the only modification involves changes in study staff. If it is determined that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

Please note that you must submit all research involving human participants for review. **Only the IRB or designees may make the determination of exemption**, even if you conduct a study in the future that is exactly like this study.

Please be aware that **approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.**

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.