

THE GEOGRAPHY OF MOTIVATION AND PARTICIPATION  
AMONG COMMUNITY GARDENERS

IN AUSTIN, TEXAS

THESIS

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**ABSTRACT**

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Individual community gardeners are motivated to participate in organized gardening projects for a variety of reasons. Understanding the motivations of community gardeners allows for spatial comparisons to be made between gardeners of a similar mindset. Mapping the spatial footprint of participation, or the participation shed, for community gardens allows their contributions to the local food system to be visualized and compared. Using semi structured interviews and surveys of 63 community gardeners at five community gardens in Austin, Texas, this study identifies eight motivations for participation in community gardens. Gardens and motivational groups are then compared on the basis of demographic and spatial variables, and cartographic visualizations of gardener participation are created for each garden. Results indicate that motivations

related to social interaction, access to garden resources and food quality are most important, while those related to cultural identity, economics and environmental concern are least important. Two classes of garden emerge from the spatial analysis, with regional and neighborhood gardens having markedly different participation sheds.

## I. INTRODUCTION

Community gardens have received increasing attention from a wide range of academics, professionals, activists, hobbyists, students, and politicians as potential solutions to problems as diverse as food insecurity, childhood obesity, social fragmentation, economic instability, and declining biodiversity. Academics in particular have focused on community gardens not only as sources of food and nutrition, but also their role in cultural, political, economic, and ecological systems at multiple scales (Smith and Kurtz 2003; Baker 2004; Glover 2004; Beilin and Hunter 2011; Evers and Hodgson 2011).

Though much work has been done cataloguing the benefits of community gardens to participants and society at large, what is not as well understood is how these benefits translate into expressed motivations for participation in community gardens or the relative strength of these motivating factors at inspiring gardeners to overcome impediments such as friction of distance to access gardens. Meanwhile, although the inherently spatial focus of the discourse surrounding local food networks has led to efforts to map the food systems of both urban and rural areas at the state, census tract and even neighborhood level, there is a deficit in research designed to visualize these networks at the scale of individual behaviors (Peters et al. 2009; Hu et al. 2011; Hubley 2011; Kremer and DeLiberty 2011; Russell and Heidkamp 2011). This

research is intended to address this deficit by assessing the motivations of community gardeners in Austin, Texas as well as modeling the spatial patterns of their participation using a geographic information systems (GIS) approach.

## **II. PURPOSE STATEMENT**

The purposes of this study are to assess the motivations for participation among community gardeners, to describe the relative strength and importance of these motivations as measured by their frequency and the distance traveled to gardens by gardeners expressing each motivation, and to illustrate, using a GIS, the geographic participation-sheds of a sample of community gardens within the Austin, Texas metropolitan area. The results of this inquiry promise to inform scholarly discourses on the evolving role of community gardens within urban space as well as inform urban land managers of the characteristics of community garden participation-sheds and the motivations of participating gardeners.

### **III. RESEARCH QUESTIONS AND CONCEPTUAL FRAMEWORK**

#### RESEARCH QUESTIONS

In order to achieve the objectives stated above, the following research questions will be addressed:

- What are the primary motivations for participation among community gardeners in Austin, Texas?
- Do motivational groups exhibit significantly different demographic characteristics?
- What are the spatial patterns of participation among community gardeners?
  - o Do motivational groups exhibit different spatial patterns?
  - o Do gardeners with similar demographic characteristics exhibit significantly different spatial patterns?
- Do gardeners participating in long-standing community gardens (established 1970s-1990s) exhibit significantly different spatial, motivational, and demographic characteristics compared to those at recently established (2000s) gardens?

## CONCEPTUAL FRAMEWORK

These questions will be answered through quantitative analysis and cartographic visualization of responses to a structured survey (administered face-to-face) as well as a qualitative assessment of semi-structured interviews (recorded onsite) with gardeners at selected community gardens in the Austin area. Although tailored for this study, these questions were derived from previous research on urban agriculture, alternative food networks (AFN), and community gardens.

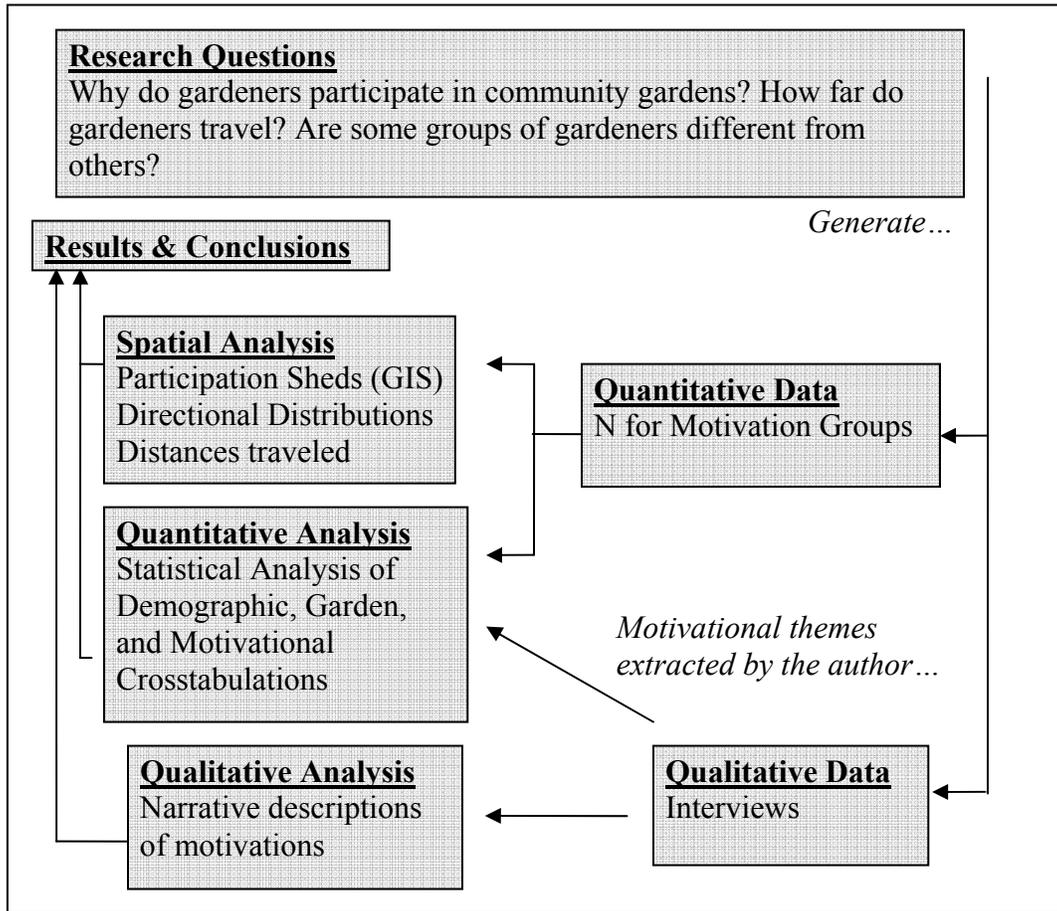


Figure 1 Conceptual Framework

## IV. LITERATURE REVIEW

### CIVIC AGRICULTURE

From the origin of agriculture through the early 20<sup>th</sup> century, food production and urban space were inextricably linked both spatially and culturally. As centers of commerce, power, and ritual, cities in times and places as diverse as Pre-Columbian South America and von Thuenen's 19<sup>th</sup> century Germanic princedoms have depended upon the bulk of their food being produced by physical labor and within distances able to be traversed on foot, by beast or sailboat (Hall 1966; Pringle 2011). With the beginning of industrialization, faster and cheaper ways of growing and transporting agricultural products have been developed and introduced in North America and around the world. These technologies have resulted in significant increases in the per-farmer productivity of North American agriculture, a development made both possible and necessary by widespread urbanization as people moved off of farms to work in factories and offices. Now highly urbanized, 82% of the US population lives in cities and is dependent upon food grown on large farms in distant rural areas for their daily nutrition (CIA 2012).

The implications of this fact are many and diverse. Numerous critics have sought to popularize the negative social, environmental, public health, economic, and security consequences of both the industrialization of food production and its absence from the

consciousness of most eaters (Carson 1962; Merrill 1976; Schlosser 2001; Nestle 2002; Pollan 2006). Broadly summarized, these (and other) authors describe the problem of contemporary agro-industrial food production as follows: urbanization and the increased scale and mechanization of farming has resulted in a great increase in the degree of popular ignorance of environmental degradation in America's rural hinterland, as well as the disintegration of longstanding social structures upon which public morality, republican democracy, and the nation's long term economic stability are dependent, while the urban populace as a whole has become increasingly unhealthy and vulnerable to disruptions of the food supply due to market fluctuations, political instability, social inequality, and environmental change. Some of the responses to these assertions have been the creation of 'local' and 'alternative' food systems within and adjacent to cities. Organic, biointensive, ecological, and permaculture approaches to food production; community gardening, co-operative marketing outlets for farmers, and urban agriculture are examples of some of these emergent responses (Kaufman and Bailkey 2000; Jeavons 2006; Ingram 2007; Nordahl 2009).

As one of the oldest of these movements and systems, community gardening as currently conceived of can trace its roots back to the late 19<sup>th</sup> century with the promotion of urban food gardens by the mayor of Detroit and the passing of the Allotment Acts in Britain (Glover 2003; Pudup 2008; Milburn and Vail 2010). Such urban food gardens have historically been promoted during times of war, economic depression, spiking food and energy prices, and shifting public sentiment as ways to address the impact these disruptions have on people's food supply. Until the late 1970's, however, they were largely temporary in nature and intent, conceived of as responses to the problem of a

momentarily insufficient food supply. For example, Liberty and Victory Gardens during the World Wars were not intended to be critiques of the existing food production and distribution system, but rather were meant to increase the overall food supply and unburden national distribution networks of domestic consumption in order to supply food to overseas allies. Likewise, the Relief Gardens of the Great Depression and Potato Patches of the 1890's were intended to supply unemployed urbanites with self-produced food in lieu of government handouts. Although a push for school gardens around the turn of the 20<sup>th</sup> century had as one focus the instillation of civic values among immigrant children, these gardens largely faded away after the 1930's, and it was not until the 1970's that community garden projects began to prioritize concerns such as neighborhood beautification, building social capital, and enhancing community ties (Smith and Kurtz 2003; Pudup 2008).

Community gardening in the 21<sup>st</sup> century is characterized by an enormous diversity of forms, locations, intentions, and strategies. While Pudup's (2008) "three tributary discourses and movements evincing collective resistance and individual self-improvement that, taken together, animate contemporary organized garden projects (1232)" focus on urban renewal, the therapeutic benefits of plants, and urban ecology, other authors include concerns about nutrition and food security, maintenance of cultural traditions, social protest, and the economic impact of gardens (Airriess and Clawson 1994; Patel 1996; Baker 2004; Saldivar-Tanaka and Krasny 2004; Cutter-Mackenzie 2009; Evers and Hodgson 2011; Litt et al. 2011). Collectively, these themes define the potential motivations explored by this study.

## MOTIVATIONS OF COMMUNITY GARDENERS

Gardeners are motivated by a wide variety of benefits including ‘inarticulable motivations’, intrinsic joy, desire to grow one’s own food, to save or even make money by growing food, out of a sense of neighborhood pride, the desire to maintain culturally unique farming traditions, for educational purposes, to enact social protest or as a political demonstration, to preserve or improve ecological functioning, for health reasons, to build and participate in community, and as a form of relaxation or therapy (Airriess and Clawson 1994; Smith and Kurtz 2003; Saldivar-Tanaka and Krasny 2004; Glover et al. 2005; Graham & Zidenberg-Cherr 2005; Gross and Lane 2007; Lydersen 2009; Milburn & Vail 2010; Beilin and Hunter 2011; Turner 2011). Although direct comparison of the results of these studies is not possible due to methodological differences, taken as a whole, they can be synthesized into at least seven different conceptual groupings of benefits: Environmental Quality, Relaxation and Recreation, Psychospiritual Benefits, Nutrition and Food, Cultural Identity, Social Interaction, and Economics. Assuming gardeners participate because of the benefits they enjoy as a result of participating, these groupings can also be understood as the motivations of community gardeners.

### *Environmental Quality*

Regardless of whether community gardens actually contribute positively to environmental quality, the perception that they do is a powerful and frequently mentioned idea in the popular and academic discourse about urban sustainability and may serve as a

significant motivator among gardeners. Although community gardens are often included as components of ‘sustainable cities’ development agendas, empirical evidence of the contributions made by gardens to ecological functioning is mostly lacking (Beilin and Hunter 2011). While diverse, organically managed agricultural landscapes have been found to host higher levels of biodiversity than conventionally managed farms, owing to their relatively small size and fragmented arrangement on the landscape, as well as the fact that most of the plants in a typical community garden are domesticated crops rather than native species, community gardens are likely not providing significant direct benefits to the local ecology, unless considered as a component of larger networks of actively managed urban natural areas (Loram et al. 2007; Goddard et al. 2009; Underwood et al. 2011). This does not mean community gardens do not contribute to environmental quality, only that their contributions are mostly indirect. By offsetting purchased food with locally grown food, community gardens *may* reduce overall food miles and the associated emissions due to food transportation, though this would vary on a case by case basis, and existing research does not support the assertion that most community gardeners actually source the majority of their food from their garden plots (Evers and Hodgson 2011).

On the other hand, in cases where community gardens are built on formerly abandoned, garbage strewn lots or in which the presence of a community garden preserves land from development, they may contribute to urban greenspace, which has been shown to have a wide range of positive environmental effects (Gill 2007). However, these benefits are only attributable to community gardens in instances where they are replacing, from an environmental perspective, a less desirable land use. Perhaps

the most significant contribution that community gardens can make to environmental quality is as spaces where people can go to learn about nature and environmental issues, and be inspired to make changes in other areas of their life to decrease their environmental impact (Blake and Cloutier-Fisher 2009). Thus, while evidence of the direct environmental benefits of community gardens is thin, their indirect contributions are somewhat more supported.

### *Relaxation and Recreation*

Gardening is and has long been a popular hobby in many parts of the world. Gardens can be spaces of self-reflection and artistic expression, where gardeners can allow their creative faculties to flow and their attention to wander. This mental release offers a valuable contrast to the highly focused, structured, and stimulating environments characteristic of contemporary urban life and can be very restorative (Gross and Lane 2007; Hale et al. 2011). The beneficial effects of plants on mental functioning and life satisfaction for people of all ages have been documented in several studies. Windowless indoor environments devoid of plants were found to have a detrimental effect upon academic performance and the classroom experience for students in both middle school and college age groups (Doxey, Waliczek and Zajicek 2009; Daly, Burchett and Torpy 2010). This carries through into adulthood, with research showing a positive relationship between having a view of plants from the workspace and overall life satisfaction, job satisfaction and satisfaction with coworkers among office workers (Dravigne et al. 2008). For urbanites spending much of their time indoors, community gardens offer an important opportunity to relax, unwind, and relieve the stress of daily life.

### *Psychospiritual Benefits*

Such positive associations can, over the course of time, develop into deep emotional bonds between gardeners and gardens and the vegetables they produce. Gardeners develop a sense of pride in and connection to their work and their gardens (Gross and Lane 2007; Lautenschlager and Smith 2007). These connections are especially interesting for their embodied nature, meaning that gardeners link themselves corporeally to the places of their gardens via the production and consumption of food. This embodiment makes food from community gardens more personally significant to gardeners than purchased food, which is essentially an economic commodity and thus vulnerable to the forces of economic globalization (Turner 2011). By contrast, garden produce takes on attributes related to personal identity, spirituality, and ethics (Blake and Cloutier-Fisher 2009; Teig et al. 2009). Such concerns are, at least theoretically, more insulated from economic forces, thereby preserving the places and practices of community gardens from such forces. This is significant given the sometimes precarious nature of land tenure at community gardens (Smith and Kurtz 2003).

### *Nutrition and Food*

As discussed previously, past community gardening movements had as their primary focus the production of food in quantity to offset disruptions of the food supply caused by war and economic downturns. Concerns about food and nutrition continue to animate the community gardening discourse, though with a different focus than before. With the incredible increases in gross agricultural production thanks to the Green

Revolution, caloric deficiency is no longer a problem for the vast majority of Americans. Rather, diseases associated with eating too *much* food, and eating food of a low *quality* have become one of the greatest threats to public health in contemporary American society (Ver Ploeg et al. 2009).

Many researchers have sought to understand why people choose to eat either healthful or unhealthful foods, with the roles of access, culture, and social inequality emerging in the literature as favored topics for discussion and research (Lautenschlager and Smith 2007; Corrigan 2011). A common conclusion is that socially disadvantaged people are more likely to experience food insecurity, the lack of “access at all times to enough food for an active, healthy life (Coleman-Jensen et al. 2011).” This lack of access, manifested on the landscape, defines what is known as a food desert (Corrigan 2011).

These findings are not universally accepted, however. In a 2009 report on food deserts, the United States Department of Agriculture (USDA) Economic Research Service found that:

“Easy access to all food, rather than lack of access to specific healthy foods, may be a more important factor in explaining increases in obesity. Many studies find a correlation between limited food access and lower intake of nutritious foods. Data and methods used in these studies, however, are not sufficiently robust to establish a causal link between access and nutritional outcomes. That is, other explanations cannot be eliminated as the cause of lower intake (Ver Ploeg et al. 2009, 3).”

Thus, while in theory lack of physical access to healthful food negatively impacts dietary habits, untangling it from the numerous other influences on what any one person chooses

to eat is so difficult that it makes generalized statements about food security or food deserts problematic at smaller scales of analysis such as neighborhoods or even cities. Each individual person navigates the food landscape differently according to their own abilities and preferences; arbitrary measures of distance to particular types of stores do not account for the underlying values that determine what obstacles a person is willing to overcome in order to access healthful foods.

Community gardens, however, are different from other sources of healthful foods, such as supermarkets, in that participants are engaged as both consumers and producers of food, transforming their understanding of what food is and their relationship to it, including its importance (Turner 2011). In fact, the positive impact of community gardens on dietary habits is well supported throughout the literature (McCormack et al. 2010). For example, a survey of community gardeners in Perth, Australia, found that community garden plots produced at least some of the produce consumed for 24 out of the 28 gardeners interviewed (Evers and Hodgson 2011). Research conducted among gardeners in Denver, Colorado found that “56% of community gardeners consumed fruits and vegetables at least 5 times per day, compared with 37% of home gardeners and 25% of nongardeners (Litt et al. 2011, 1469).” Community gardeners in Baltimore, Maryland expressed increased “[awareness] of their involvement with food systems and ... opportunities to obtain fresh food” as a result of their participation in the garden, and reported giving surplus produce away to others (Corrigan 2011, 1238). Food production, as the central activity of most community gardens, is clearly related to increased consumption of these healthful foods.

### *Cultural Identity*

Gardening is bound up with culture in that it allows for the continuation of traditional techniques of production, preparation, and consumption of food. Community gardens in particular, as spaces defined by collective purpose and/or action, offer an especially powerful way for people to explore, assert, and create cultural identities. For Vietnamese market gardeners of New Orleans, gardening allows for the consumption of vegetables unavailable in mainstream markets, while providing an opportunity for older immigrants to carry over traditional livelihoods from rural villages to their new home in America. In addition to personal consumption by gardeners, the sale of these foods allows the wider Vietnamese community to continue eating traditional foods, while strengthening social ties (Airriess and Clawson 1994). Latino community gardeners in New York City use community gardens as spaces to gather together for celebrations and holidays, with nearly half of the gardens in one study maintaining small structures and common lawns similar to those found in the agricultural fields of Puerto Rico. Such gardens offer culturally relevant public space in relatively close proximity to the people who use it as “an alternative to traditionally designed and managed parks (Saldivar-Tanaka and Krasny 2004, 409).” In one Toronto community garden, Chinese gardeners produce vegetables such as long bean, taro, and hairy gourd using layered polycultures. For these gardeners, “the garden is an opportunity to use skills developed during their working careers as farmers in China and to grow culturally appropriate herbs and vegetables for the dishes they enjoy cooking (Baker 2004, 314).”

### *Social Interaction, Political Expression*

Community gardens are spaces where people come together for a common purpose. This requires communal action and decision making, which in turn results in the creation and use of various forms of social capital, as well as the production and intensification of democratic ideals (Glover 2004; Glover et al. 2005; Firth et al. 2011). In Smith and Kurtz's (2003) study of community gardeners' responses to the threat of land development in New York City, these ideals and connections between people were shown to exist at multiple scales. Networks of gardeners, activists, and public figures were built and mobilized to respond to existential threats at the local, state, and national level, effectively framing the political discourse in scale appropriate terms and drawing in adequate resources to protect garden space from private development. These ties may be forged within, as well as between, cultural groups. At the Riverside community garden in Toronto, Sri Lankan and Caribbean immigrants living in a low income housing development were able to transcend the cultural divide, and residents that previously did not interact became friends. Since the property managers built the garden, "vandalism and property maintenance costs have dropped; vacancy rates are low because people want to stay longer...and fewer social problems arise because people know each other and seem to be able to resolve conflicts more easily (Baker 2004, 322)."

### *Economics*

Relatively few studies have sought to quantify the economic impact of community gardens, but one notable example, cited often in the broader community

gardening literature, is Patel's (1996) study of a Rutgers University initiative to build gardens throughout Newark, New Jersey. The figures involved are quite significant, with 30 acres of gardens producing an estimated \$916,005 worth of food in 1994 and \$4 million dollars of savings by diverting leaves to composting rather than municipal waste pickup (Patel 1996). Because the economic impact of gardening is, at least in part, linked to their capacity to offset purchased food, the extent to which gardeners eat garden produce can be understood as a proxy for economic value. Although people are motivated to produce their own food for a variety of reasons, economic considerations feature prominently in historical community gardening movements and are a key element in many discussions of community food security (Evers and Hodgson 2011). For Vietnamese market gardeners in New Orleans, economic opportunity is a much more straightforward motivator, with the sale of produce offering older gardeners an income stream in addition to the other benefits of their gardening activities (Airriess and Clawson 1994).

## SPATIAL ANALYSIS OF ALTERNATIVE FOOD NETWORKS

Concerns about the energy consumption associated with transporting food long distances and the economic impact of globalization on local communities has led to calls for a reinvigoration of local and alternative food systems. In response there has been a push to understand the geographic extent of the networks of production and consumption that provide cities with food, also referred to as 'foodsheds' (Hu et al. 2011). The community garden participation sheds generated in this study are a component of

Austin's foodshed. Kremer and DeLiberty (2011) visualize the local foodshed of Philadelphia, including urban farms, community gardens, institutional gardens, urban orchards, farmers markets, restaurants, institutions, co-ops, and food retail in the analysis. Plotting the location of the various sites of production, distribution, and consumption allowed not only for the overall foodshed to be visualized, but for spatial comparisons between types of producers as well as for a directional distribution of producers to be constructed. This showed that most of the sources of local food came from within the state of Pennsylvania, despite the fact that Philadelphia sits on the border with New Jersey and close to both Delaware and Maryland. At a larger scale of analysis, urban farms were shown to have localized distribution networks within particular neighborhoods. Hu et al. (2011) constructed hypothetical food sheds for Iowa using a "linear programming approach to develop a quantitative optimization model for foodshed localization...[minimizing] the total geographic transportation effort for a prespecified region (221)." Their model estimates demand on the basis of dietary recommendations and conversion to crop equivalents, and potential supply with potential yields of these crops. This allows the construction of polygons representing hypothetical regions of paired production and consumption with minimum transportation distance. A similar method was employed by Peters et al. (2009) for New York State. One notable difference is the fact that, because New York State was not deemed capable of food self-sufficiency, this model estimates production on the basis of all available land being converted to agriculture, and seeks to minimize the distance this food travels, rather than seeking to feed all the people with food coming from the closest possible source.

A second area of research has been the identification of food deserts. These efforts range from simple ‘distance to supermarket’ and income ranges for census tracts, to more complex models using service area networks for various retail outlets integrating variable distance thresholds for different locations (Hubley 2011; Russell and Heidkamp 2011; United States Department of Agriculture Economic Research Service 2011). Modeling food access, however, is very challenging as it is different for each person and place (Hubley 2011). Thus far, work to pair foodshed analysis with food desert mapping seems to be lacking. In part this may owe to the fact that the existence of food deserts is contested in some academic and government publications. To recall the Ver Ploeg et al. (2009) report from the USDA; “[e]asy access to all food, rather than lack of access to specific healthy foods, may be a more important factor in explaining increases in obesity (3).” Further research is needed to understand the individual level determinants of access to healthful food to supplement existing research done with aggregated data. No research was found to have included mapping of participation among community gardeners, much less work linking such spatial behavior and individual traits. Likewise no work was found which considered travel by individual consumers in alternative food networks. This study will seek to address these deficiencies.

## V. RESEARCH METHODS

### SITE AND SITUATION

Austin, the capitol city of Texas, has a population of approximately 800,000 people, with an economy based on government, education, high tech industry, health care, and business services (Austin Chamber of Commerce 2011). Its reputation for having a progressive, experimental culture and vibrant arts scene, along with the presence of a major university and strong economic base has long made the city a tourism and migration destination for people from other regions.

Community gardening in Austin extends back at least as far as 1978, the year the oldest currently operating community garden was formed. There are anywhere from 26-32+ community gardens in Austin, though the exact number of community gardens depends on how community garden is defined. The Coalition of Austin Community Gardens maintains a listing of some 32 garden sites with a total of more than 465 plots, though again this number is approximate due to the variation in how the different gardens are run. For example, some gardens have individual plots for individual gardeners, while others maintain only large commonly cultivated plots (Coalition of Austin Community Gardens 2012). In 2011, the City of Austin hired a ‘Sustainable Urban Agriculture Coordinator’, tasked in part with the coordination of community gardens throughout the city. The creation of this position has occurred roughly concurrently with the construction

of new community gardens, legal recognition and definitions for community gardens and urban farms, and alternative permitting for water use on urban farms and vegetable gardens (City of Austin 2011).

## DEFINING COMMUNITY GARDENS

Perhaps the most significant hurdle to overcome in designing research on community gardening is the lack of a precise, commonly accepted definition of the term (Blake and Cloutier-Fisher 2009; Firth et al. 2011; Turner et al. 2011). Some authors, when faced with this lack of a succinct definition of community gardens, choose to include alternative food production practices as varied as Community Supported Agriculture, communal and individual plot gardens, school gardens, and backyard garden sharing as equal members of the community gardening fold (Blake and Cloutier-Fisher 2009; Flachs 2010). Popular definitions can be even less precise; the American Community Gardening Association (ACGA) defines a community garden as “[a]ny piece of land gardened by a group of people (American Community Gardening Association 2012).” Such a definition could include ornamental landscapes shared by next door neighbors, commercial urban agriculture operations, school gardens, allotment gardens, botanical gardens, community run farms, and even road medians maintained by homeowners associations. This definition could easily be extended to nearly any actively managed horticultural landscape. To avoid confusion, Pudup (2008) proposes the term ‘organized gardening project’, rejecting ‘community garden’ entirely. While this may be appealing from a theoretical perspective, the great majority of participants in these

gardens self-identify as and prefer to use the term ‘community garden’ (Turner et al. 2011). Thus, while a more precise working definition is needed if research is to be conducted with any degree of efficiency and clarity, the term itself is rooted in both practice and the academic literature, and should be preserved.

One of the more frequently cited authors, T.D. Glover (2003), defines community gardens as “plots of urban land on which community members can grow flowers or foodstuffs for personal or collective benefit”, with the additional stipulation that “...gardeners share certain resources, such as space, tools, and water.” This provides a more precise definition, as it situates community gardens within urban space, and implies a more formal understanding of membership and community, thereby excluding unofficial or informal gardens such as ‘guerrilla’ gardening or backyard gardens. Nevertheless, this definition can still encompass botanical gardens, urban farms, school gardens, and allotment style gardens, all of which may be located in places as diverse as houses of worship, abandoned lots, city parks or private land.

The City of Austin has adopted a specific legal definition for ‘city supported community garden’. According to city code, a city supported community garden “is used by a group of four or more participating gardeners either on separate plots or farmed collectively by the group to grow, produce and harvest food crops for personal or group use, consumption or donation by the non-profit organization or cooperatively for the benefit of its members (City of Austin 2011).” This definition has the advantage of being locally defined, specific to food production and exclusive of entrepreneurial urban farming.

It does not, however, make any distinction between gardens that are collectively farmed versus gardens that are made up of separate plots. In reality, many gardens have both, but those gardens for which individual plots are the main focus are in the majority. Indeed, of roughly 32 gardens in a regional community gardens list maintained by the Coalition of Austin Community Gardens, just four gardens are reported as having exclusively collectively managed growing areas (Coalition of Austin Community Gardens 2012). On the other hand, there are at least 465 individual plots across Austin's other community gardens, with each plot representing at least one gardener. Owing to their great preponderance, gardeners of individual plot gardens will be the focus of this research.

#### DEFINING THE POPULATION OF GARDNERS STUDIED

Across the literature, variation in the physical form of gardens is found to be attributable to the underlying motivations and values of the gardeners who participate in and create the gardens in question (Airriess and Clawson 1994; Saldivar-Tanaka and Krasny 2004; Lydersen 2009). Maintaining similarity of garden form and setting may be one way of selecting gardens which draw from the same population of potential community gardeners, an important consideration when designing social science research.

Firth et al. (2011) found in their study of community gardens in Nottingham, UK, that gardens could be categorized as either location based or interest based. Interest based gardens were made up of people drawn together from widely dispersed areas to

form a gardening community, motivated largely by shared ideals or a common group identity. Gardens at schools and houses of worship are examples of this type, as are gardens formed as political projects by activists. Location based community gardens consisted of people drawn together mostly by physical proximity, for example gardens formed by groups of neighbors wishing to clean up abandoned lots or beautify a local park. This distinction has some very important implications for research into the travel patterns of community gardeners. If gardeners elect to join one garden on the basis of membership in some external community (e.g. school, church, fraternal organization, etc) and do not consider distance in their decision, while gardeners at another garden have *not* joined their garden on the basis of such membership, but rather on the basis of proximity to the garden, it would be inappropriate to aggregate travel distances from the two gardens in order to compare the different motivational categories.

For this reason, this research will limit the analysis to those gardens which can be identified as location based, while excluding those based on common interests or membership in some outside group. In a practical sense, this means excluding gardens sponsored by or located on the grounds of overtly ideological groups, such as religious organizations, and gardens associated with outside communities, for example Boy Scout troops, schools, social clubs, residential co-operatives, etc. Instead, this research will focus on gardens for which the organizing commonality of membership is judged to be proximity to the garden, and which are located on publicly owned or accessible land.

To select the gardens for the study, the list of gardens available from the Coalition of Austin Community Gardens was examined and pared down using the following priorities:

- 1) Individually managed and tended garden plots as sole or primary focus
- 2) Not affiliated with an outside religious, social or educational organization
- 3) Preference given to more actively tended (full) gardens
- 4) Balance between small and large, old and new gardens

These selection criteria resulted in the following list of gardens:

Table 1 Gardens

<b>GARDEN NAME</b>	<b>LOCATION</b>	<b>PLOTS</b>	<b>SAMPLE</b>	<b>FOUNDED</b>
Alamo Community Garden	2101 Alamo St.	29	6	1994
Deep Eddy Community Garden	3001/2 Atlanta	34	8	1978
Festival Beach Community Garden	35 Waller St.	80	15	2010
Sunshine Community Gardens	4814 Sunshine Drive	150	30	early 1970s
Blackshear Community Garden	2011 E. 9th St.	8	4	2008
<i>Homewood Heights Community Garden</i>	<i>2606 Sol Wilson</i>	7	0	2008
<i>Clarksville Garden</i>	<i>1705 Waterston St.</i>	19	0	2004
<i>Montopolis Community Garden</i>	<i>1417 Montopolis Dr.</i>	9	0	2008

These gardens together contain a total of 336 plots, and represent a selection of the more established, actively tended gardens around the city. They also all contain reference to a particular street, neighborhood or park in their names and are distributed throughout the city in both more and less economically affluent neighborhoods. Before undertaking formal fieldwork, each garden was visited to determine appropriateness for the study. Two gardens originally under consideration were removed from the list because they were on church property and consisted of mostly inactive plots. The target sample size for each garden was the larger of either 20% of the number of plots in the garden, or 5 gardeners. Because some gardens are comparatively small, a 20% sample does not provide a large enough N for meaningful quantitative analysis. For all gardens, the actual number of gardeners surveyed was largely dependant upon how many people were in the garden when it was visited, thus the sampling strategy was a modified convenience sample.

Smaller gardens necessitated setting up appointments with gardeners ahead of time to ensure that gardeners would be present. This was made possible by contacting the garden coordinators for each garden as listed on the Coalition of Austin Community Gardens list. Montopolis Community Garden was dropped from the analysis after interviewing the garden coordinator because of inactivity. It is run by the staff of a local WIC clinic, but the neighboring community does not participate. Staff is involved because it is part of their job requirements, but do not live near the garden. Clarksville Garden was eliminated because of insufficient responses (n=0), despite four visits to the garden and several fruitless attempts (phone and email) to contact the garden

coordinators. Homewood Heights garden was eliminated after conducting one interview, and the data discarded, because it was determined to be a collectively managed garden.

## DATA COLLECTION AND ANALYSIS

This research employed a mixed methods approach. Qualitative data consist of gardeners' motivations for participation and survey responses indicating the closest street intersection to their residence, primary mode of transportation to the garden, access to gardening space other than the community garden, housing type, educational attainment, gender, and travel origin. Quantitative data include gardener age, several questions to gauge gardeners' level of involvement in the garden, reported time spent traveling to the garden, and amount of previous gardening experience. Distances and patterns of travel were established by asking gardeners for the closest street intersection to their home, generating a relatively accurate yet anonymous geocoding of gardeners' points of origin.

Semi-structured interviews were conducted with gardeners after administering the survey. Standard questions were designed to prompt gardeners to provide explanations for why they participate in the community garden, whether and how those reasons have changed with time, which of their reasons for participating are strongest, why and how they decided to participate in their particular community garden instead of some other community garden, whether they are aware of other community gardens in which they are not interested in being involved, and additional questions asked as deemed appropriate by the interviewer for clarification of responses to the standard questions.

The interview responses were recorded on a digital voice recorder and manually coded by the author to identify and describe motivational themes. Responses were also used to validate and give nuance to the survey data as well as allow gardeners to express information not covered by the survey questions. During the coding process, particular emphasis was placed on those themes identified in the literature, namely: Environmental Quality, Relaxation and Recreation, Psychospiritual Benefits, Nutrition and Food, Cultural Identity, Social Interaction, and Economics. Selected themes and quotations have been integrated into the final results as deemed appropriate to deepen and clarify the quantitative results.

To identify spatial patterns in gardener participation, geocoded gardener origins were paired with garden locations to construct participation sheds for each garden using ArcGIS v10.0 Geographic Information System (GIS). Following Kremer and Deliberty (2011), network distance was determined using a shortest path analysis for each gardener-garden pair and aggregated to determine mean distance traveled for each garden as well as mean distance traveled for each motivational theme. The process was repeated using shortest travel time instead of shortest distance, allowing comparison between calculated and reported travel times. Standard deviational directional distributions were created for each garden. Exploratory visual representations of gardener origins on the basis of responses to survey questions were also created.

Motivational groups were compared on the basis of demographic and spatial characteristics including age, hours spent in the garden, years of gardening experience, and time and distance traveled using the Kruskal-Wallis test, a nonparametric equivalent of 1-way ANOVA.. After assessing normality using the Kolmogorov-Smirnov test, one

way ANOVA was used as appropriate to further examine between group differences among motivations, with Levene's test applied to evaluate equality of variance. Frequency tables with cross tabulations were used to explore categorical variables including gender, final level of education, housing type, mode of transportation and garden. With more than 20% of the classes having less than 5 cases, many expected values less than 1, and non mutually exclusive classes, the data was deemed inappropriate for analysis using the chi-square statistic.

Gardens were also compared on the basis of demographic and spatial characteristics including age, hours spent in the garden, years of gardening experience, and time and distance traveled using Kruskal-Wallis. Once again, categorical data did not meet the prerequisite assumptions for use of the chi-square statistic, limiting results to simple descriptive statistics.

Correlation (Spearman's rho and Pearson's r) matrices of all gardeners were calculated for demographic characteristics including age, hours spent in the garden weekly, and years of experience as well as spatial behavioral variables including reported travel time, calculated travel time and calculated distance.

## IRB MANAGEMENT

This work has been determined to be exempt from full or expedited review by the Texas State Institutional Review Board. See Appendix B for documentation.

## VI. RESULTS

### QUANTITATIVE RESULTS

#### *Demographics of Gardeners*

Data describing the demographics of community gardeners included sex, level of formal education, housing type, mode of transportation, access to other gardening spaces, home as origin for trips, hours spent in the garden weekly, years of gardening experience, calculated network distance to the garden, reported travel time and calculated travel time. The one sample Kolmogorov-Smirnov test was applied to the overall distribution of each ratio demographic variable to determine normality. Only age and calculated travel time were identified as having normal distributions. Kruskal-Wallis tests were conducted to determine the statistical significance of any differences between motivational groups for all ratio variables, including age and calculated distance. Mean years of experience was found to differ significantly between gardeners expressing cultural identity motivations and gardeners not expressing cultural identity motivations (Table 9). However, only five gardeners expressed cultural identity as a motivation, limiting the conclusions that can be drawn from these statistical results. Separate one way ANOVA analyses were conducted with the motivational groups as factors for both age and calculated distance. Initial results indicated a significant difference in calculated distance traveled for gardeners either expressing or not expressing economic motivations. Further investigation using

Levene's Test for Equality of Variances rejected the assumption of equal variance, and pushed the significance of the subsequent independent samples t-test above 0.05 ( $n=63$ ,  $p=0.195$ , Table 11). Kruskal-Wallis was used to evaluate differences between gardens for age, hours spent in the garden, years of gardening experience, calculated and reported time spent traveling to the garden and calculated distance to the garden. Gardens were found to differ significantly for calculated and reported time spent traveling to the garden, calculated distance, and gardener age (Table 13). Gardens were also compared on the basis of demographic and spatial characteristics including sex, education, housing type, mode of transportation to the garden, access to gardening space, origin of trips to the garden and motivation. Data did not meet the prerequisite assumptions for use of the chi-square statistic, limiting results to simple descriptive statistics (Table 15).

Overall correlations between demographic characteristics using Spearman's Rho showed, unsurprisingly, a positive relationship between age and years of experience ( $n=63$ , Spearman's Rho = 0.516,  $p < 0.000$ ), as well as between several measures of time and distance traveled ( $n=63$ , range of values for Spearman's Rho = 0.602-0.994,  $p$  for all values  $<0.000$ ). There is also a positive, though weak, correlation between years of experience and hours spent gardening each week ( $n=62$ , Spearman's Rho = 0.274,  $p = 0.030$ ) (Table 20).

Table 2 Demographics of All Gardeners

		n	% total
Sex (n)	Female	37	59%
	Male	26	41%
Education (n)	HS/ GED	4	6%
	Some College	5	8%
	Bachelors	24	38%
	Masters	19	30%
	Professional	5	8%
	PhD	5	8%
	(blank)	1	2%
Housing (n)	Detached	43	68%
	Multi Family	19	30%
	Vehicle	1	2%
Transp. (n)	Car	44	70%
	Bicycle	7	11%
	Transit	2	3%
	Walk	8	13%
	Multiple/Other	3	5%
Access (n)	No	25	40%
	Yes	38	60%
Home is Origin (n)	50/50	8	13%
	N	11	17%
	Y	44	70%

Table 3 Ratio Demographics of All Community Gardeners

	<b>N</b>	<b><math>\mu</math></b>	<b><math>\sigma</math></b>	<b>Min</b>	<b>Max</b>
Age	63	48.3	14.3	23	76
Hours / Week	63	4.92	5.12	1	30
Years of Experience	63	18.1	15.3	1	55
Distance (km)	63	6.27	7.05	0	39
Travel time, rep. (min)	63	9.14	7.22	0	40
Travel time, calc (min)	63	5.05	5.00	0	26

Table 4 Key to Motivational Group Abbreviations

CI	Cultural Identity
EC	Economics
EQ	Environmental Quality
FD	Food and Nutrition
LA	Access to Land and Resources
PS	Psychosocial Benefits
RR	Relaxation and Recreation
SI	Social Interaction

Table 5 Categorical Demographic Variables by Motivational Theme

		CI	EC	EQ	FD	LA	PS	RR	SI
	Gardeners (n)	5	8	15	49	56	19	39	56
	% of Gardeners	8%	13%	24%	78%	89%	30%	62%	89%
Sex (n)	Female	2	7	8	32	34	12	20	31
	Male	3	1	7	17	21	7	19	24
Education (n)	HS/ GED	1	0	1	3	4	1	3	3
	Some College	1	0	2	3	3	2	4	4
	Bachelors	0	2	4	17	21	6	16	21
	Masters	3	4	6	17	19	7	8	17
	Professional	0	2	0	4	4	1	3	5
	PhD	0	0	2	4	5	2	4	5
	(blank)	0	0	0	1	0	0	1	1
Housing (n)	Detached	2	6	10	35	38	12	27	41
	Multi Family	3	2	4	14	18	7	12	14
	Vehicle	0	0	1	0	0	0	0	1
Transp. (n)	Car	2	6	12	33	39	9	23	38
	Bicycle	2	0	3	4	7	5	6	7
	Public Transit	0	0	0	2	1	0	2	2
	Walk	1	1	0	8	7	2	5	6
	Multiple/Other	0	1	0	1	2	2	2	2
Access (n)	No	3	2	5	19	22	9	18	22
	Yes	2	6	10	30	34	10	21	34
Home is Origin (n)	50/50	2	2	1	6	7	5	7	8
	N	0	2	0	8	9	2	7	11
	Y	3	4	14	35	40	12	25	37

Table 6 Categorical Demographic Variables by Motivational Theme as Percentage of Gardeners Expressing Each Theme

		CI	EC	EQ	FD	LA	PS	RR	SI
	Gardeners (n)	5	8	15	49	56	19	39	56
	% of Gardeners	8%	13%	24%	78%	89%	30%	62%	89%
Sex (n)	Female	40%	88%	53%	65%	61%	63%	51%	55%
	Male	60%	13%	47%	35%	38%	37%	49%	43%
Education (n)	HS/ GED	20%	0%	7%	6%	7%	5%	8%	5%
	Some College	20%	0%	13%	6%	5%	11%	10%	7%
	Bachelors	0%	25%	27%	35%	38%	32%	41%	38%
	Masters	60%	50%	40%	35%	34%	37%	21%	30%
	Professional	0%	25%	0%	8%	7%	5%	8%	9%
	PhD	0%	0%	13%	8%	9%	11%	10%	9%
	(blank)	0%	0%	0%	2%	0%	0%	3%	2%
Housing (n)	Detached	40%	75%	67%	71%	68%	63%	69%	73%
	Multi Family	60%	25%	27%	29%	32%	37%	31%	25%
	Vehicle	0%	0%	7%	0%	0%	0%	0%	2%
Transp. (n)	Car	40%	75%	80%	67%	70%	47%	59%	68%
	Bicycle	40%	0%	20%	8%	13%	26%	15%	13%
	Public Transit	0%	0%	0%	4%	2%	0%	5%	4%
	Walk	20%	13%	0%	16%	13%	11%	13%	11%
	Multiple/Other	0%	13%	0%	2%	4%	11%	5%	4%
Access (n)	No	60%	25%	33%	39%	39%	47%	46%	39%
	Yes	40%	75%	67%	61%	61%	53%	54%	61%
Home is Origin (n)	50/50	40%	25%	7%	12%	13%	26%	18%	14%
	N	0%	25%	0%	16%	16%	11%	18%	20%
	Y	60%	50%	93%	71%	71%	63%	64%	66%

Table 7 Ratio Demographic Variables by Motivational Theme

	n		Age (years)	Hours (weekly)	Experience (years)	Calc. Distance (km)	Travel Time, rep. (min)	Travel Time, calc. (min)
CI	5	$\mu$	38	3.4	3.4	3.35	9.4	2.91
		$\sigma$	11.83	2.07	2.61	4.03	3.8	3.33
		Min	28.00	1.00	2.00	5.00	0.68	0.73
		Max	56.00	6.00	8.00	15.00	10.37	8.74
EC	8	$\mu$	42.13	3.13	12.38	12.42	12.6	8.91
		$\sigma$	14.77	0.99	8.67	13.82	12.7	9.18
		Min	27.00	2.00	2.00	1.00	0.05	0.07
		Max	63.00	5.00	25.00	40.00	39.10	26.34
EQ	15	$\mu$	53.8	3.32	18.47	5.96	10.8	4.81
		$\sigma$	15.34	2.28	17.13	4.8	7.2	3.25
		Min	27.00	1.00	1.00	5.00	1.43	1.35
		Max	76.00	10.00	55.00	30.00	15.97	10.88
FD	49	$\mu$	48.67	4.92	17.67	6.58	9.1	5.25
		$\sigma$	13.92	5.6	15.23	7.64	7.5	5.4
		Min	23.00	1.00	1.00	0.00	0.05	0.07
		Max	76.00	30.00	55.00	40.00	39.10	26.34
LA	56	$\mu$	49.15	4.7	18.39	6.14	9.4	5.01
		$\sigma$	13.74	5.01	15.57	7.17	7.2	5.13
		Min	27.00	1.00	1.00	0.00	0.05	0.07
		Max	76.00	30.00	55.00	40.00	39.10	26.34
PS	19	$\mu$	48.47	4.37	19.89	7.5	11.3	5.97
		$\sigma$	15.03	3.25	18.54	9.69	9.9	6.71
		Min	28.00	1.00	1.00	0.00	0.30	0.40
		Max	76.00	15.00	55.00	40.00	39.10	26.34
RR	39	$\mu$	50.82	4.78	17.59	5.41	8	4.49
		$\sigma$	13.87	5.11	14.67	5.3	4.8	3.99
		Min	23.00	1.00	1.00	0.00	0.05	0.07
		Max	75.00	30.00	50.00	20.00	21.21	17.14
SI	56	$\mu$	47.49	4.6	18	6.46	9.3	5.14
		$\sigma$	14.45	4.11	15.61	7.34	7.5	5.16
		Min	23.00	1.00	1.00	0.00	0.05	0.07
		Max	76.00	20.00	55.00	40.00	39.10	26.34

Table 8 Significant Results of Kolmogorov – Smirnov Tests for All Gardeners

Variable	n	Test Statistic	sig.
Age	63	0.73	0.661
Calculated Distance	63	1.288	0.073

Table 9 Significant Results of Kruskal – Wallis test (CI) \* Experience

n	Test Statistic	d.f.	sig.
63	7.573	1	0.006

Table 10 Significant Results of ANOVA for Motivational Groups

		Sum of Squares	df	Mean Square	F	Sig.
Calculated Distance * EC	Between Groups	3720942967	1	3720942967	7.714	.007
	Within Groups	29425422663	61	482383978		
	Total	33146365630	62			

Table 11 Levene's Test and t Test for Calculated Distance \* (EC)

	Levene's Test for Equality of Variances	t-test for Equality of Means Equal Variance Not Assumed		
		t	df	Sig. (2-tailed)
Calculated Distance * EC	F= 25.035 sig. < 0.000	-1.427	7.279	.195

**Table 12 Ratio Demographic Variables by Garden**

Garden		Age (years)	Hours (weekly)	Experience (years)	Calc. Distance (miles)	Travel Time, rep. (min)	Travel Time, calc. (min)
ALAMO	$\mu$	33	2.67	12	0.68	4	1.14
	$\sigma$	4.56	1.21	13.08	0.36	1.9	0.57
	Min	28.00	1.00	1.00	0.30	2.00	0.40
	Max	38.00	4.00	36.00	1.72	7.00	1.79
BLACKSHEAR	$\mu$	28	2.25	8.75	1.24	3.03	1.72
	$\sigma$	3.56	0.96	2.75	2.42	4.67	3.3
	Min	23.00	1.00	6.00	0.05	0.10	0.07
	Max	31.00	3.00	12.00	7.85	10.00	6.68
DEEP EDDY	$\mu$	46.25	5.5	21.13	2.95	8.63	3.84
	$\sigma$	7.29	3.89	16.12	1.89	3.93	2.15
	Min	35.00	1.00	2.00	1.26	2.00	1.43
	Max	54.00	10.00	44.00	9.32	15.00	6.94
FESTIVAL	$\mu$	49.07	6.35	13.33	3.95	9.8	4.72
	$\sigma$	14.01	8.14	13.11	6.31	10.22	6.62
	Min	23.00	1.00	1.00	0.08	0.00	0.08
	Max	65.00	30.00	40.00	39.10	40.00	26.34
SUNSHINE	$\mu$	54.33	4.87	22.1	5.12	10.8	6.77
	$\sigma$	13.4	4.12	16.48	3.92	6.38	4.68
	Min	27.00	1.00	1.00	1.14	0.00	1.04
	Max	76.00	20.00	55.00	21.39	30.00	17.14

Table 13 Significant Results of Kruskal–Wallis for Demographics \* Garden

Variable	n	Test Statistic	d.f.	sig.
Travel Time, calc.	63	18.65	4	0.001
Travel Time, rep.	63	13.04	4	0.011
Travel Distance, calc.	63	18.531	4	0.001
Gardener Age	62	19.30	4	0.001

Table 14 Categorical Demographic Variables by Garden

GARDEN		Alamo	Blackshear	Deep Eddy	Festival Beach	Sunshine
	Gardeners (n)	6	4	8	15	30
Sex (n)	Female	4	2	4	8	19
	Male	2	2	4	7	11
Education (n)	HS/ GED	0	0	0	2	2
	Some College	0	0	1	3	1
	Bachelors	3	3	4	4	10
	Masters	2	0	1	4	12
	Professional	0	1	1	0	3
	PhD	1	0	1	1	2
	(blank)	0	0	0	1	0
Housing (n)	Detached	3	3	7	10	20
	Multi Family	3	1	1	4	10
	Vehicle	0	0	0	1	0
Transp. (n)	Car	3	1	6	10	24
	Bicycle	2	0	1	1	3
	Transit	0	0	0	2	0
	Walk	1	3	0	2	2
	Multiple/Other	0	0	1	0	1
Access (n)	No	3	0	3	5	14
	Yes	3	4	5	10	16
Home is Origin (n)	50/50	0	1	1	3	3
	N	0	0	0	0	2
	Y	4	1	6	10	23

Table 15 Categorical Demographic Variables by Garden as Percentage of Gardeners Interviewed per Garden

GARDEN		Alamo	Blackshear	Deep Eddy	Festival Beach	Sunshine
	Gardeners (n)	6	4	8	15	30
Sex (n)	Female	67%	50%	50%	53%	63%
	Male	33%	50%	50%	47%	37%
Education (n)	HS/ GED	0%	0%	0%	13%	7%
	Some College	0%	0%	13%	20%	3%
	Bachelors	50%	75%	50%	27%	33%
	Masters	33%	0%	13%	27%	40%
	Professional	0%	25%	13%	0%	10%
	PhD	17%	0%	13%	7%	7%
	(blank)	0%	0%	0%	7%	0%
Housing (n)	Detached	50%	75%	88%	67%	67%
	Multi Family	50%	25%	13%	27%	33%
	Vehicle	0%	0%	0%	7%	0%
Transp. (n)	Car	50%	25%	75%	67%	80%
	Bicycle	33%	0%	13%	7%	10%
	Transit	0%	0%	0%	13%	0%
	Walk	17%	75%	0%	13%	7%
	Multiple/Other	0%	0%	13%	0%	3%
Access (n)	No	50%	0%	38%	33%	47%
	Yes	50%	100%	63%	67%	53%
Home is Origin (n)	50/50	0%	25%	13%	20%	10%
	N	0%	0%	0%	0%	7%
	Y	67%	25%	75%	67%	77%

Table 16 Motivational Responses per Garden

Garden (n)	CI	EC	EQ	FD	LA	PS	RR	SI
ALAMO (6)	1	0	0	2	6	3	2	5
BLACKSHEAR (4)	0	1	0	4	3	0	2	4
DEEP EDDY (8)	0	0	1	4	8	2	6	7
FESTIVAL (15)	2	1	5	13	11	2	8	13
SUNSHINE (30)	2	6	9	25	28	11	20	26

Table 17 Motivational Responses as Percentage of Gardeners per Garden

Garden (n)	CI	EC	EQ	FD	LA	PS	RR	SI
ALAMO (6)	17%	0%	0%	33%	100%	50%	33%	83%
BLACKSHEAR (4)	0%	25%	0%	100%	75%	0%	50%	100%
DEEP EDDY (8)	0%	0%	13%	50%	100%	25%	75%	88%
FESTIVAL (15)	13%	7%	33%	87%	73%	13%	53%	87%
SUNSHINE (30)	7%	20%	30%	83%	93%	37%	67%	87%

Table 18 Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Calc. Dist.	.187	62	.000	.770	62	.000
Calc. Time	.159	62	.001	.821	62	.000
Age	.093	62	.200	.964	62	.064
Hours	.281	62	.000	.647	62	.000
Experience	.189	62	.000	.892	62	.000
Rep. Time	.231	62	.000	.854	62	.000

Table 19 Significant results of Pearson's r correlation matrix of spatial and demographic variables for all gardeners

		Experience
Age	Pearson Correlation	<b>.570**</b>
	Sig. (2-tailed)	<b>.000</b>
	N	<b>62</b>

Table 20 Significant results of Spearman's rho correlation matrix

		Experience	Age	Calc. Dist.	Calc. Time
Hours Weekly	Spearman's Rho	.274			
	Sig. (2-tailed)	.030			
	N	63			
Experience	Spearman's Rho		.516		
	Sig. (2-tailed)		.000		
	N		62		
Rep. Time	Spearman's Rho			.603	.602
	Sig. (2-tailed)			.000	.000
	N			63	63
Calc. Dist.	Spearman's Rho				.994
	Sig. (2-tailed)				.000
	N				63

Although comparisons between motivational groups proved largely insignificant from a statistical standpoint, frequency and percentage tables of the motivational groups provide some interesting results. For example, gardeners expressing environmental motivations were more likely than any other motivational group to drive their car to the garden, while gardeners expressing economic motivations had the highest rate of living in detached, single family housing. Gardeners as a whole were very highly educated, but 100% of gardeners expressing economic motivations were college graduates, higher than any other motivational group. Overall, the most common motivations were Social Interaction and Access to Land and Resources, while the least common were Cultural Identity and Economics. The ‘typical’ community gardener lives in detached housing, drives from their home to the garden, is in their late 40’s, identifies as female and is college educated.

Differences between gardens, though in most cases unsuitable for formal statistical analysis, were more pronounced than differences between motivational groups. Festival Beach garden had the highest percentage of gardeners with less than a college education (33%), while 50% of gardeners at Alamo garden had at least a Masters degree and 100% were college graduates. Sunshine was similarly educated, with 90% of gardeners having Bachelors degrees and 57% having completed at least a Masters degree.

Alamo garden is unique among the gardens in that the Food and Nutrition motivation was expressed by a minority of gardeners, and more respondents expressed Psychosocial motivations than in any other garden. Blackshear garden is the only garden in which a majority of participants traveled by a means other than driving, and Food and Nutrition motivations were expressed by 100% of interviewees. Deep Eddy had the

highest percentage of gardeners seeking Access to Land and Resources, as well as the highest percentage of gardeners living in detached housing. Festival Beach, although it had the lowest level of education among the gardens, had the second lowest level of gardeners expressing economic motivations. The most meaningful differences between gardens are spatial.

### *Spatial Analysis*

Participation sheds and directional distributions were constructed for each of the gardens. Exploratory visualizations of gardener origins for the motivational themes were also constructed.

### Participation Shed and Directional Distribution of Alamo Community Garden



Author: GSM Date: 04/04/2013  
Source: Data collected through interviews with community gardeners during 2012  
Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203 Feet  
Projection: Lambert Conformal Conic  
Datum: North American 1983  
Units: Foot US

Figure 2 Participation Shed and Directional Distribution of Alamo Community Garden

### Participation Shed and Directional Distribution of Blackshear Community Garden

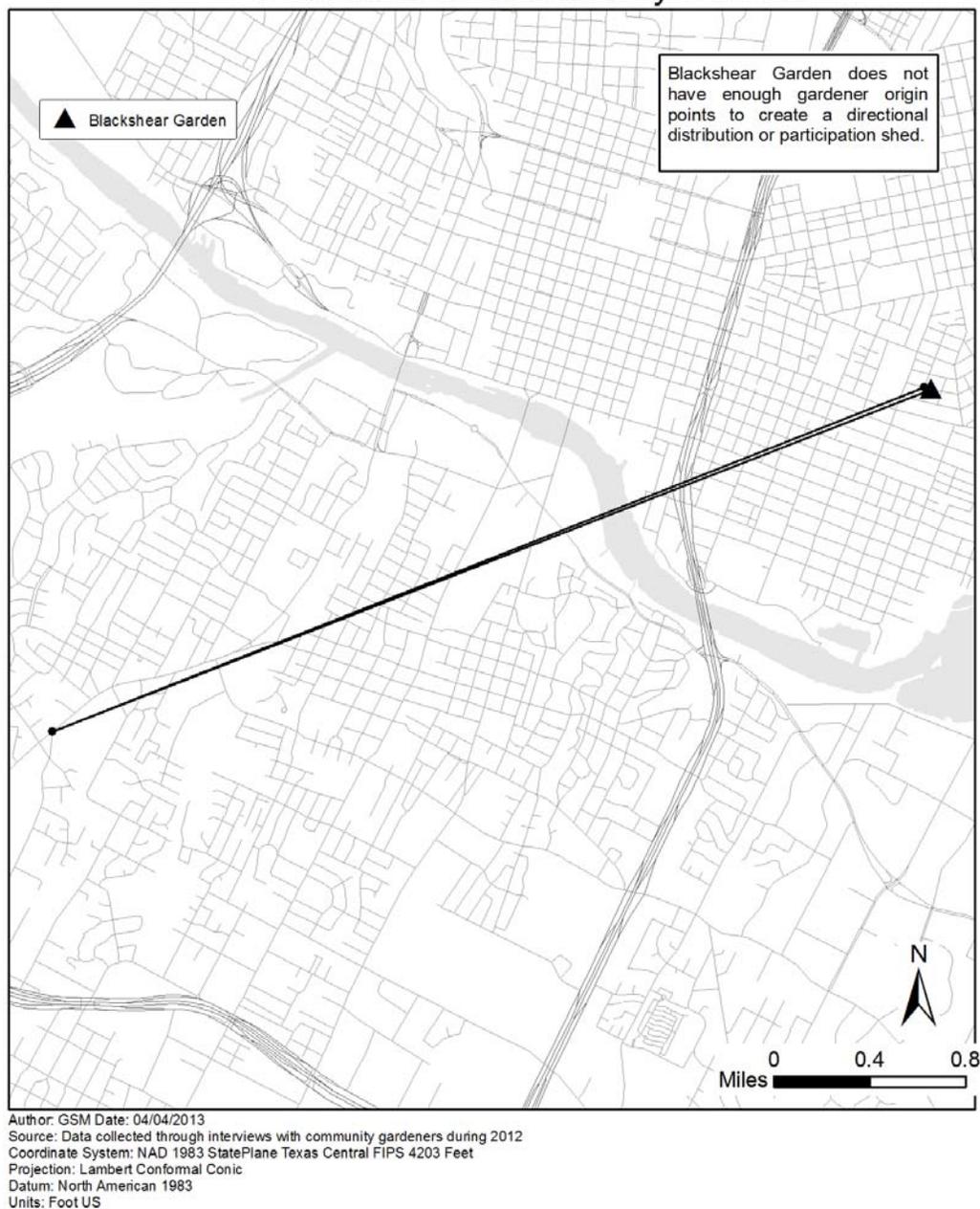


Figure 3 Participation Shed and Directional Distribution of Blackshear Community Garden

## Participation Shed and Directional Distribution of Deep Eddy Community Garden

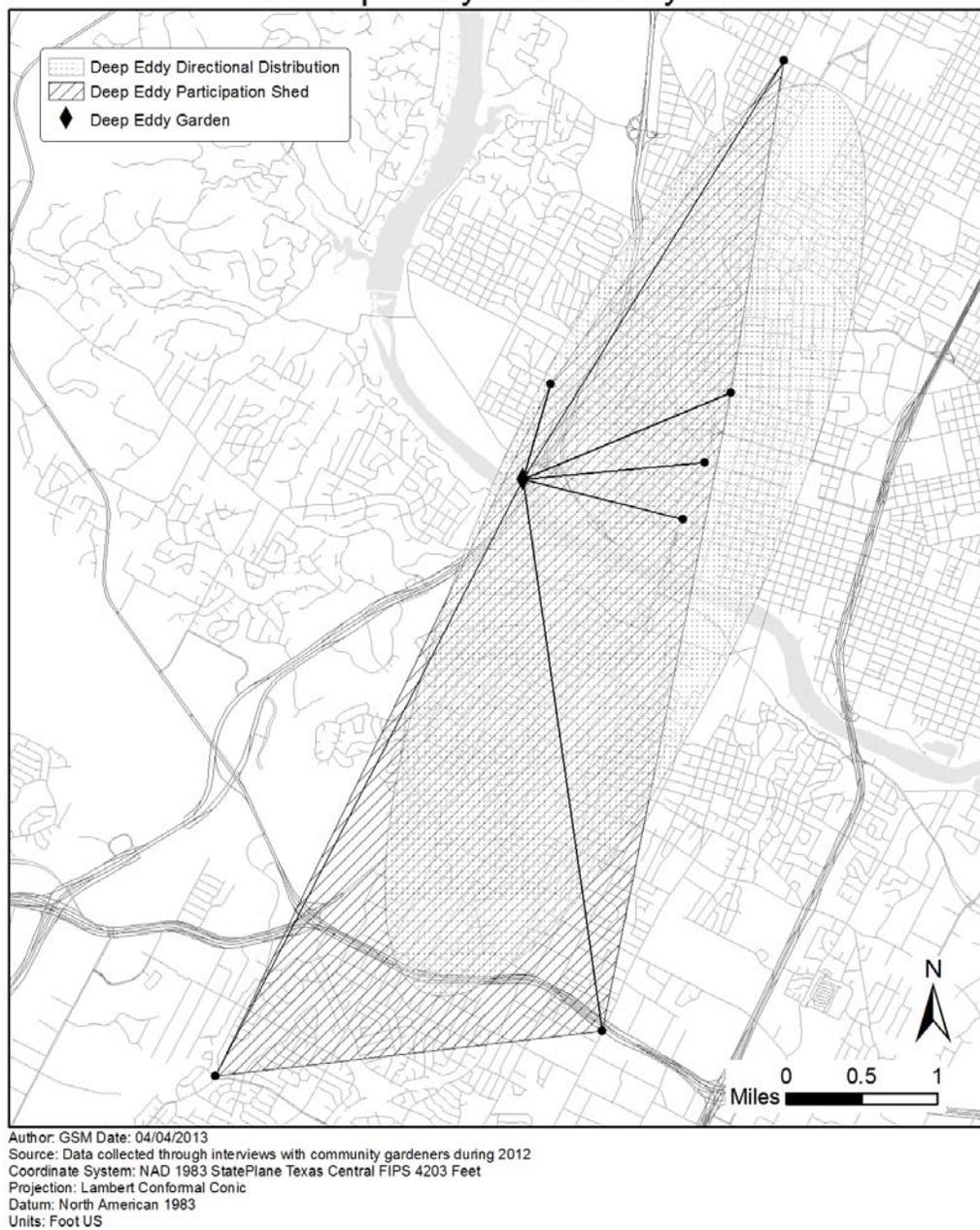
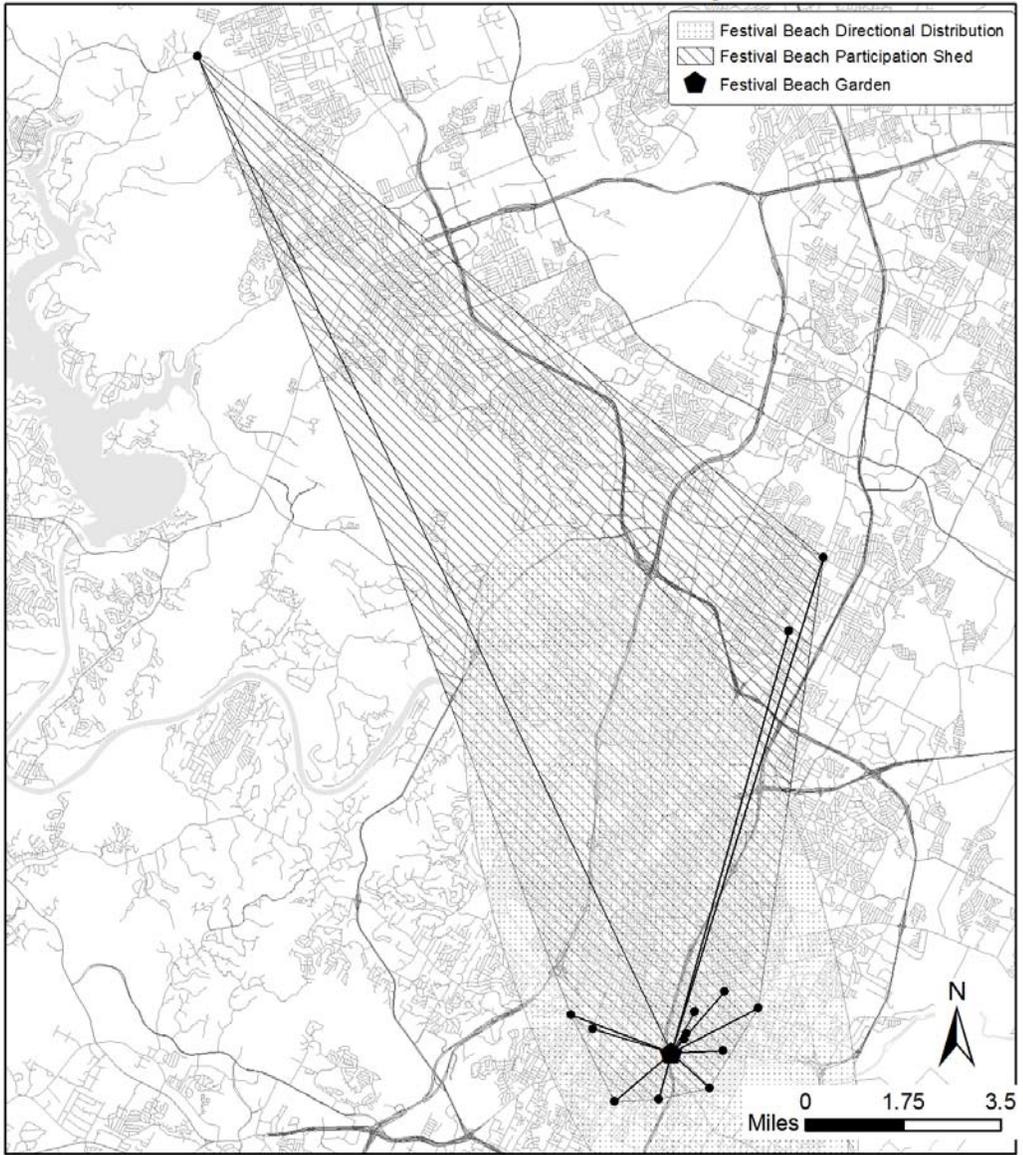


Figure 4 Participation Shed and Directional Distribution of Deep Eddy Community Garden

### Participation Shed and Directional Distribution of Festival Beach Community Garden



Author: GSM Date: 04/04/2013  
Source: Data collected through interviews with community gardeners during 2012  
Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203 Feet  
Projection: Lambert Conformal Conic  
Datum: North American 1983  
Units: Foot US

Figure 5 Participation Shed and Directional Distribution of Festival Beach Community Garden

## Participation Shed and Directional Distribution of Sunshine Community Garden

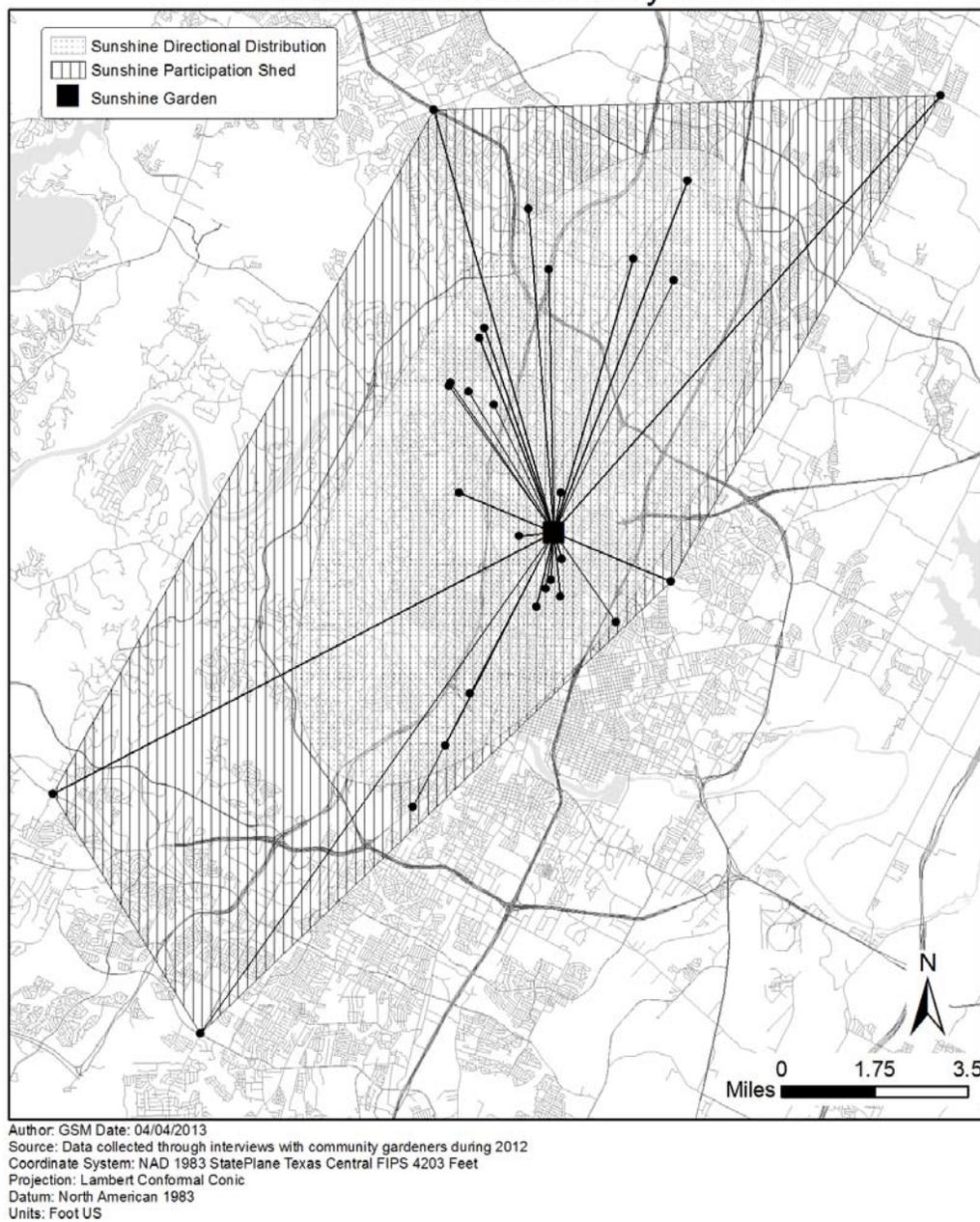


Figure 6 Participation Shed and Directional Distribution of Sunshine Community Garden

## Participation Sheds of All Community Gardens

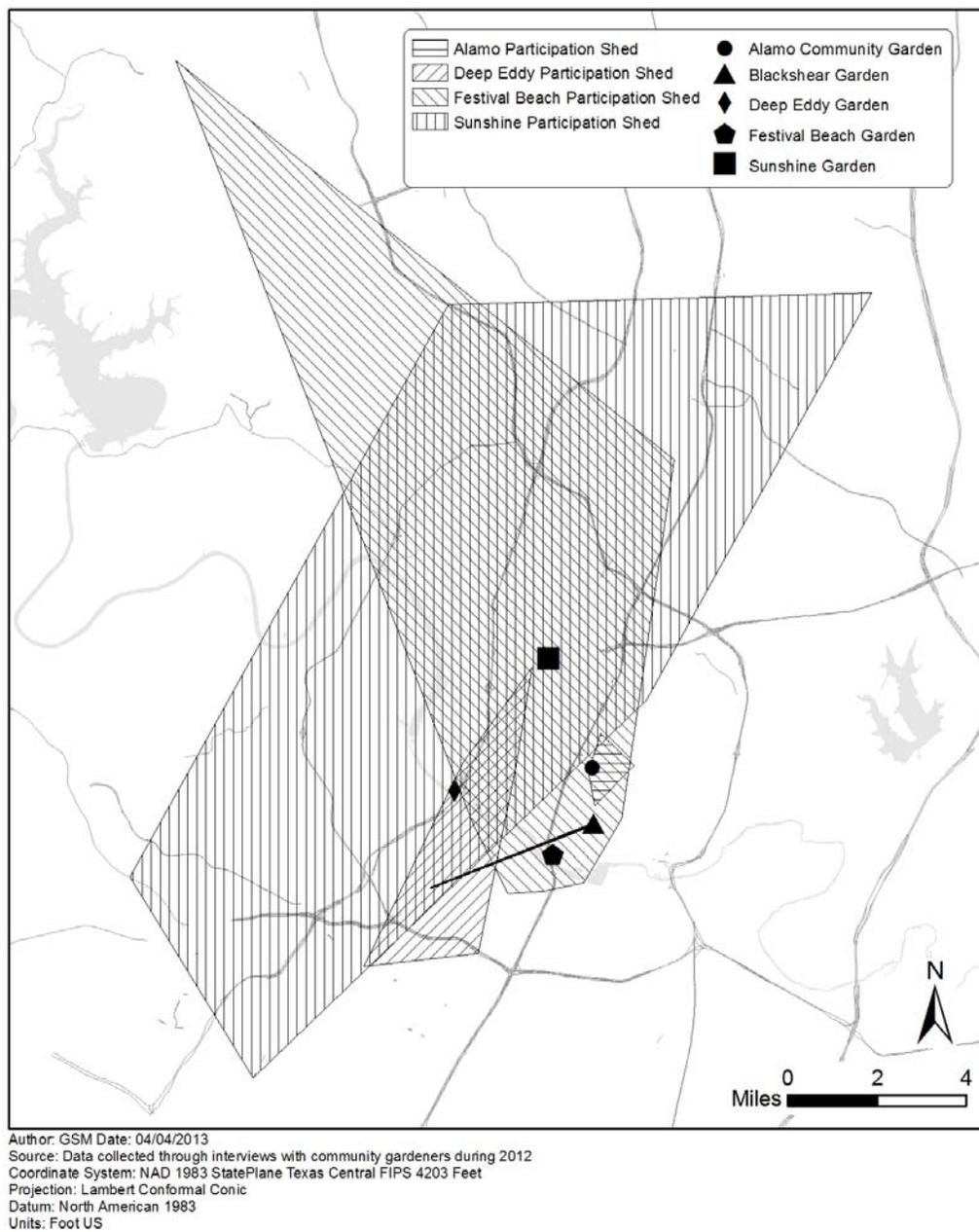
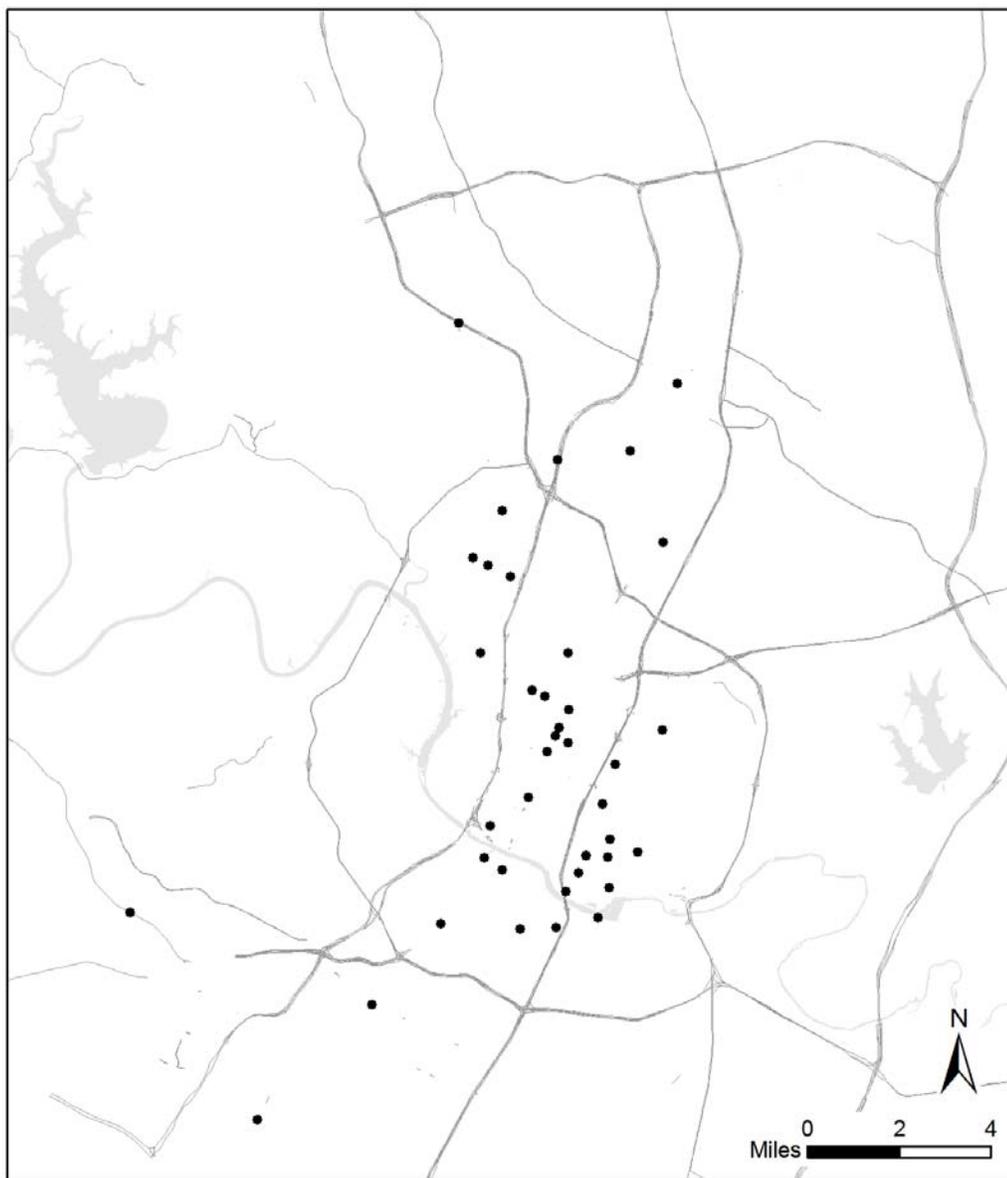


Figure 7 Participation Sheds of All Community Gardens

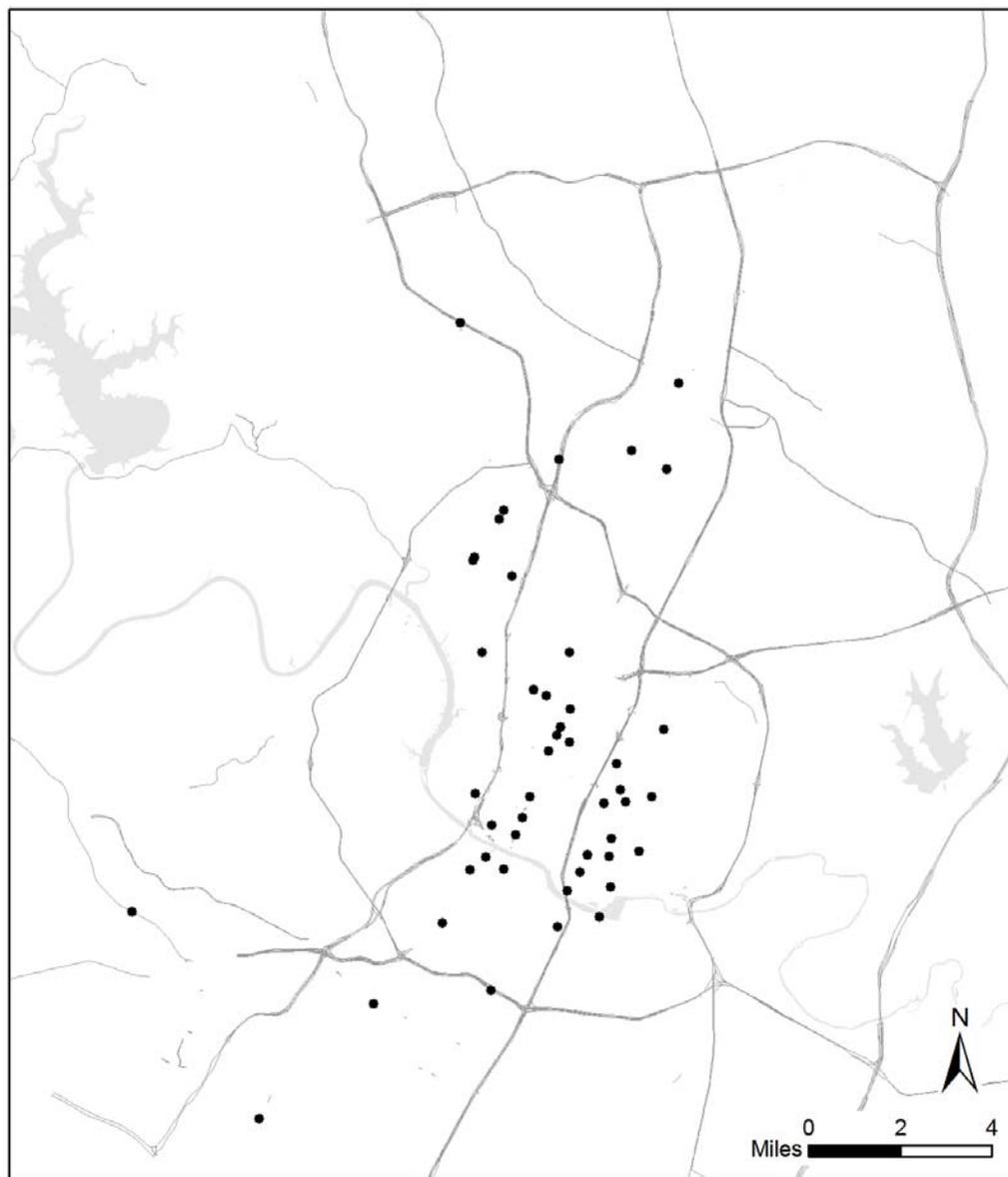
### Gardener Origins for Food and Nutrition (FD)



Author: GSM Date: 04/04/2013  
Source: Data collected through interviews with community gardeners during 2012  
Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203 Feet  
Projection: Lambert Conformal Conic  
Datum: North American 1983  
Units: Foot US

Figure 8 Origins of Gardeners Expressing Motivation - Food and Nutrition

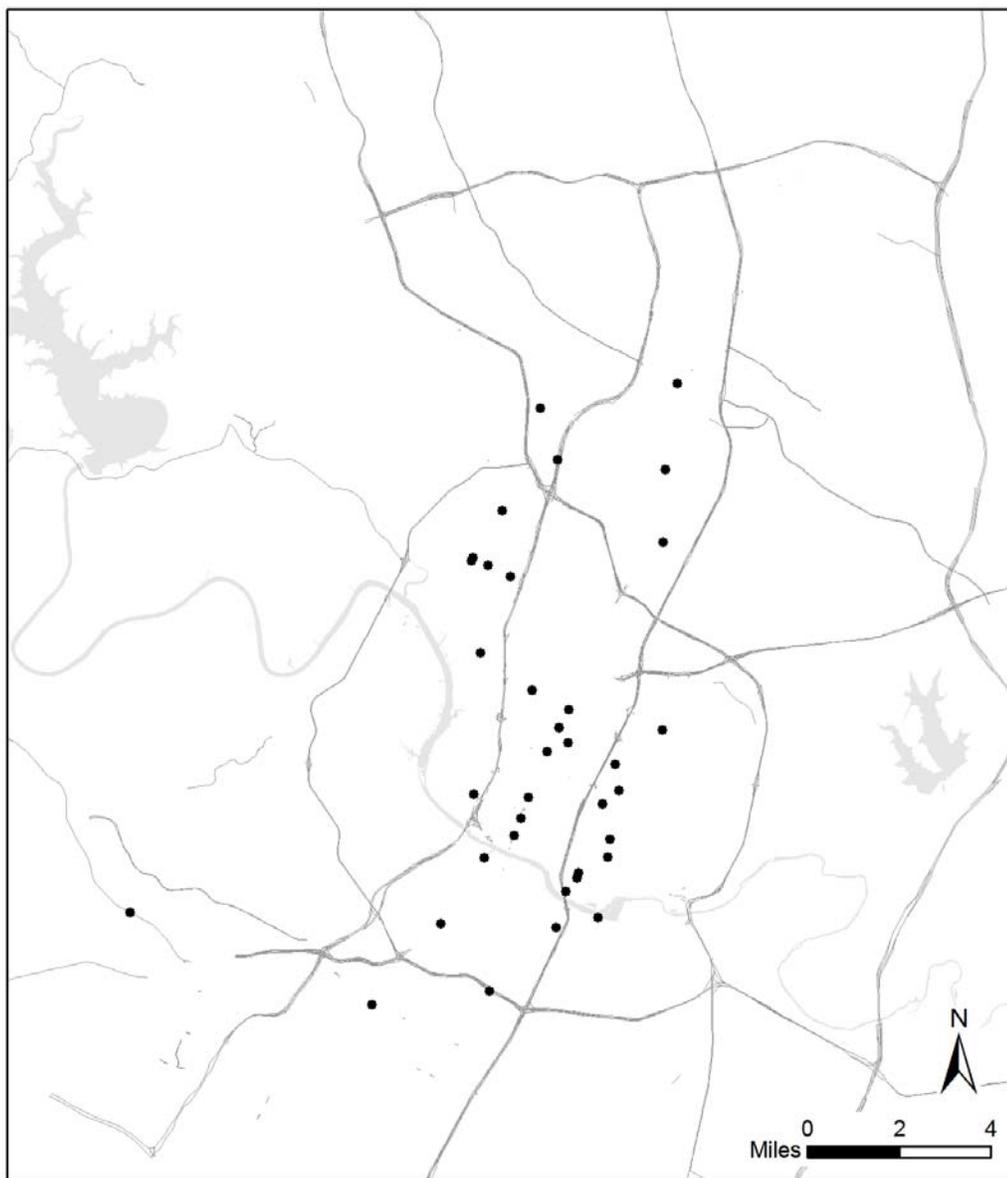
## Gardener Origins for Access to Land and Resources (LA)



Author: GSM Date: 04/04/2013  
Source: Data collected through interviews with community gardeners during 2012  
Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203 Feet  
Projection: Lambert Conformal Conic  
Datum: North American 1983  
Units: Foot US

Figure 9 Origins of Gardeners Expressing Motivation - Land and Resources

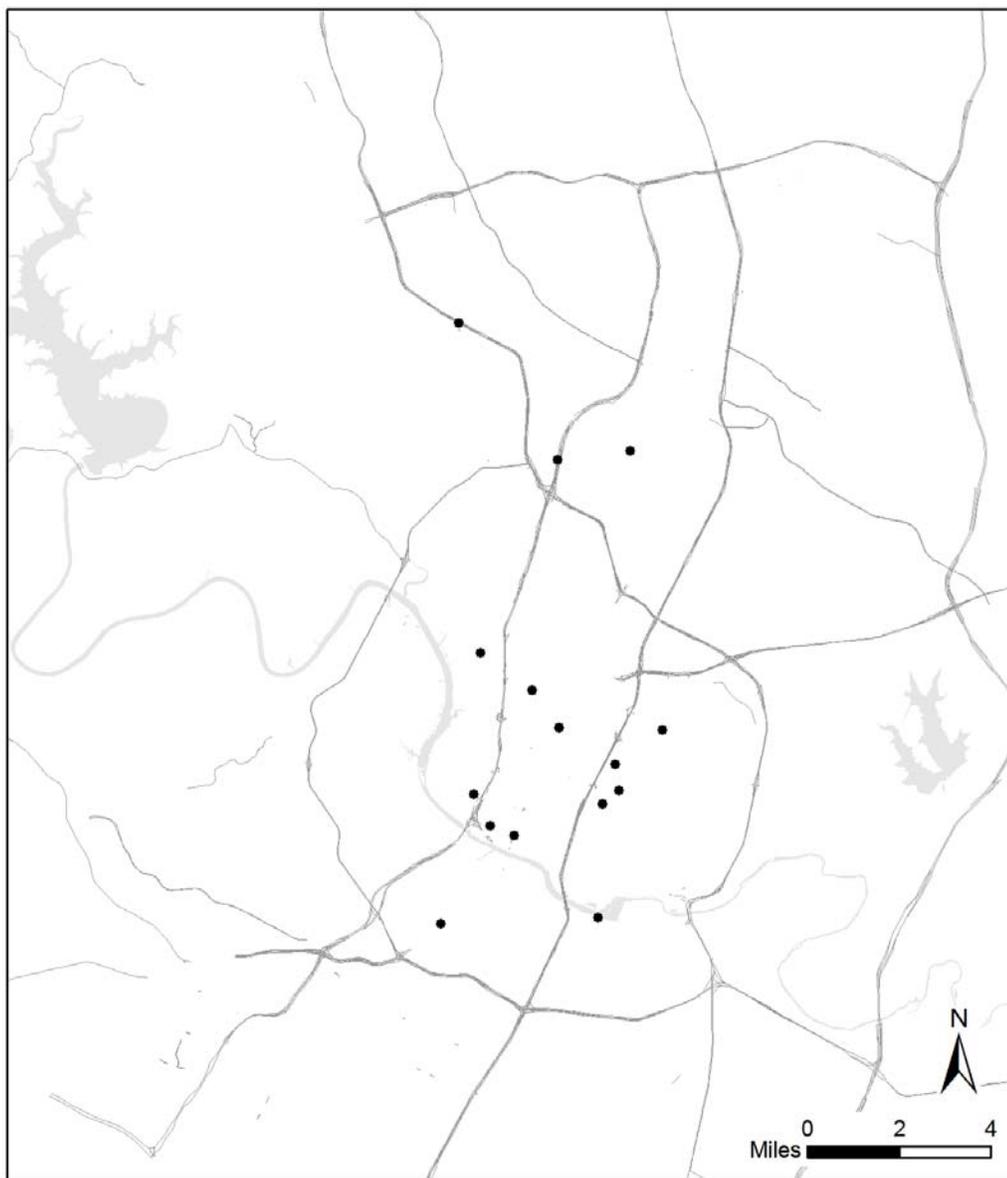
## Gardener Origins for Relaxation and Recreation (RR)



Author: GSM Date: 04/04/2013  
Source: Data collected through interviews with community gardeners during 2012  
Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203 Feet  
Projection: Lambert Conformal Conic  
Datum: North American 1983  
Units: Foot US

Figure 10 Origins of Gardeners Expressing Motivation – Relaxation and Recreation

### Gardener Origins for Psychosocial (PS)



Author: GSM Date: 04/04/2013  
Source: Data collected through interviews with community gardeners during 2012  
Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203 Feet  
Projection: Lambert Conformal Conic  
Datum: North American 1983  
Units: Foot US

Figure 11 Origins of Gardeners Expressing Motivation – Psychosocial Benefits

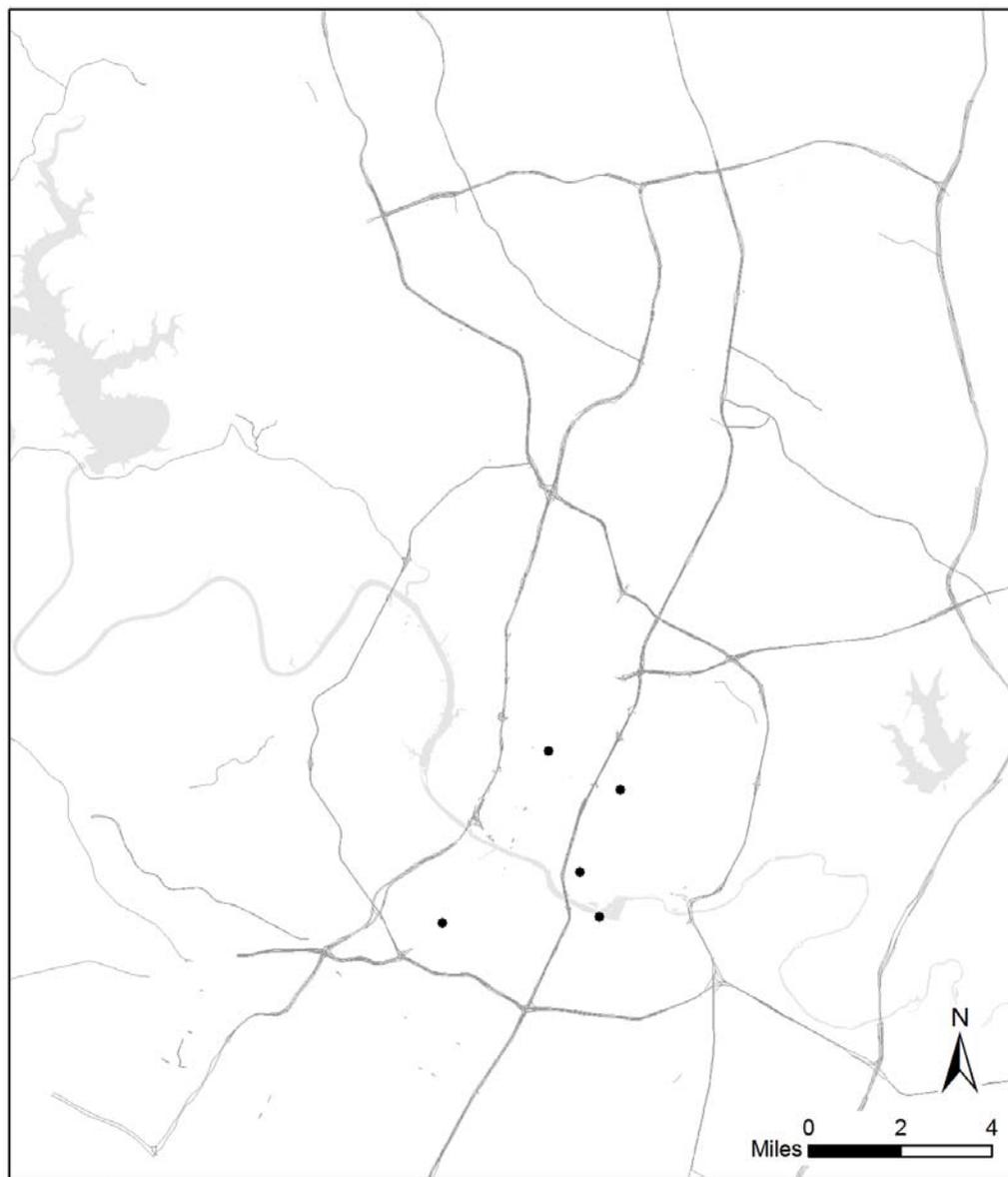
### Gardener Origins for Social Interaction (SI)



Author: GSM Date: 04/04/2013  
Source: Data collected through interviews with community gardeners during 2012  
Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203 Feet  
Projection: Lambert Conformal Conic  
Datum: North American 1983  
Units: Foot US

Figure 12 Origins of Gardeners Expressing Motivation – Social Interaction

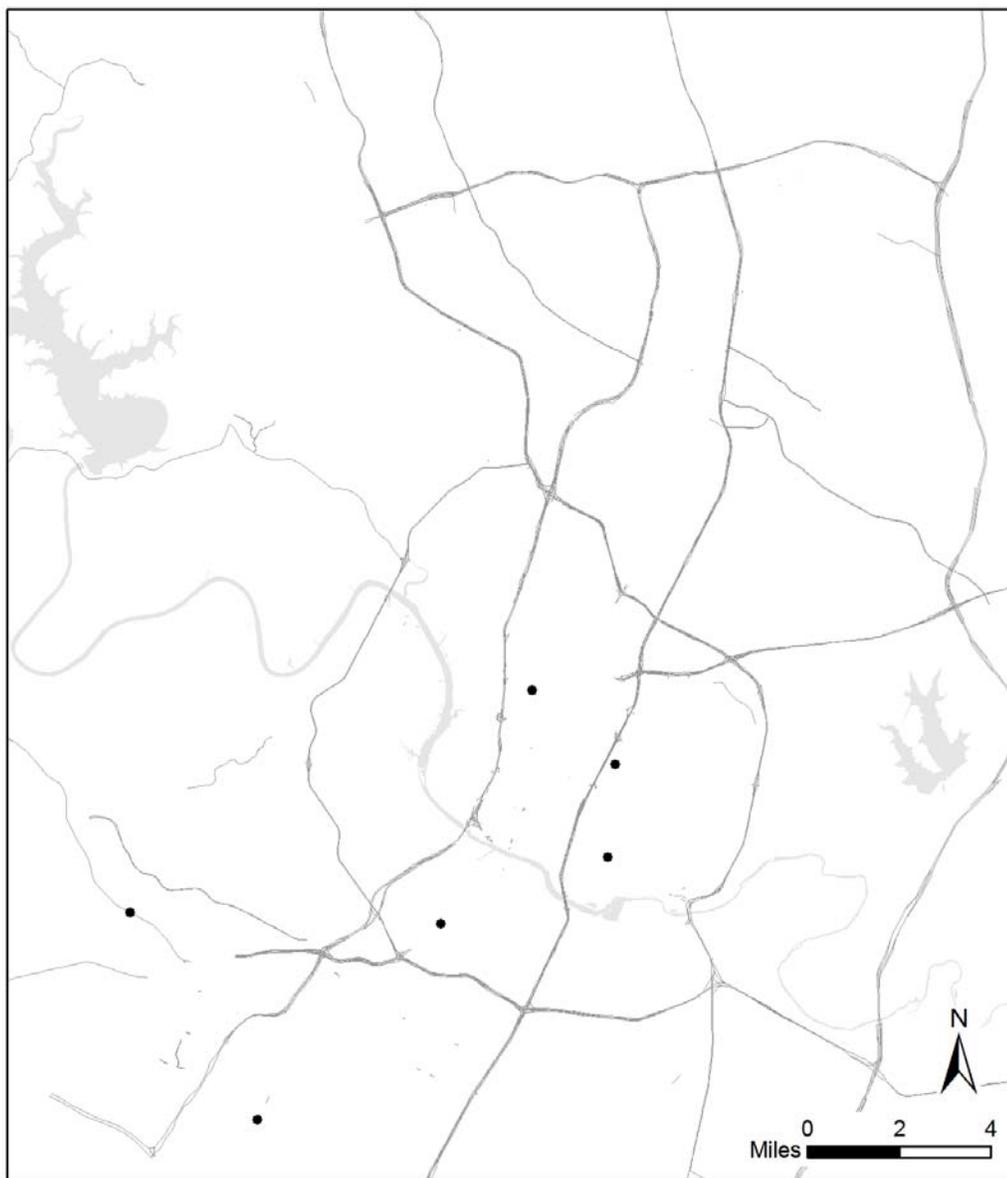
### Gardener Origins for Cultural Identity (CI)



Author: GSM Date: 04/04/2013  
Source: Data collected through interviews with community gardeners during 2012  
Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203 Feet  
Projection: Lambert Conformal Conic  
Datum: North American 1983  
Units: Foot US

Figure 13 Origins of Gardeners Expressing Motivation – Cultural Identity

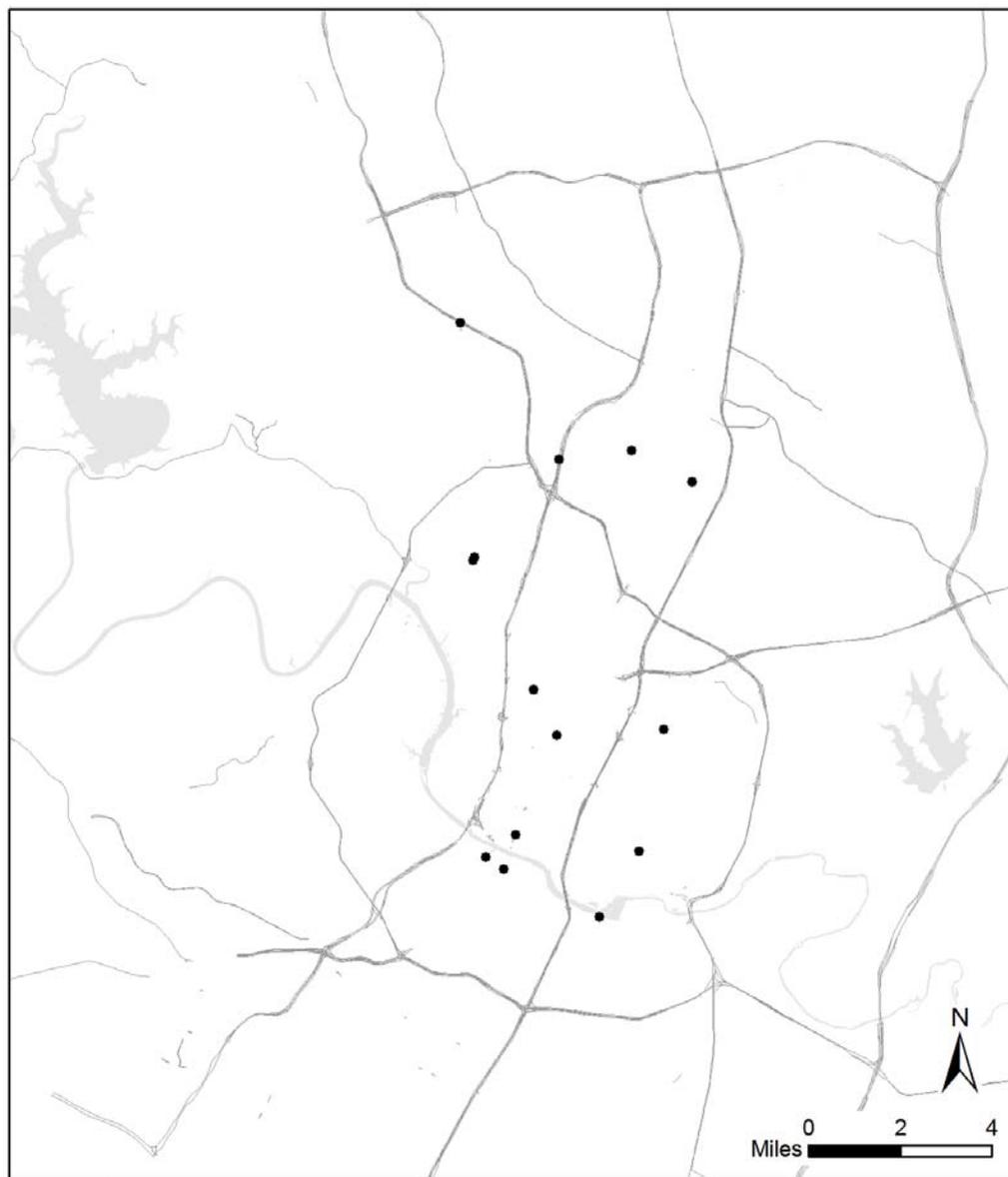
### Gardener Origins for Economics (EC)



Author: GSM Date: 04/04/2013  
Source: Data collected through interviews with community gardeners during 2012  
Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203 Feet  
Projection: Lambert Conformal Conic  
Datum: North American 1983  
Units: Foot US

Figure 14 Origins of Gardeners Expressing Motivation - Economics

## Gardener Origins for Environmental Quality (EQ)



Author: GSM Date: 04/04/2013  
Source: Data collected through interviews with community gardeners during 2012  
Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203 Feet  
Projection: Lambert Conformal Conic  
Datum: North American 1983  
Units: Foot US

Figure 15 Origins of Gardeners Expressing Motivation - Environmental Quality

The distribution of gardener participation, represented through the above participation sheds and directional distributions, illustrates the important differences between gardens. Small gardens like Blackshear and Alamo garden have small participation sheds, while large gardens like Sunshine have large participation sheds. There was no apparent clustering of motivational groups in particular parts of the city. Sunshine garden demonstrated more uniform spreading of gardener origins within its participation shed than Festival Beach, possibly indicating a relationship between the age of the garden and how far gardeners are willing to travel.

## QUALITATIVE RESULTS

Recorded interviews were reviewed by the author and evaluated for content manually. Gardeners' responses produced eight distinct motivational themes. They are: Environmental Quality, Relaxation and Recreation, Psychospiritual Benefits, Nutrition and Food, Cultural Identity, Social Interaction, Economics, and Access to Land and Resources. This represents the addition of Access to Land and Resources to the themes identified in the literature.

### *Environmental Quality*

Concern for the environment was primarily oriented towards reducing contributions towards climate change and eliminating the use of or exposure to agrochemicals. One respondent at Sunshine garden said:

“I don't want any pesticides, I don't want any poisons... Poisons are bad for the environment, it gets down into our water... They're about to kill out the bees.”

Another gardener, at Festival Beach, equated local food production with sustainable food production, saying, “[t]hinking of myself as an environmentalist, I certainly like the idea of food that don't have to transport too much...” Another said, “I also really support the local farmer's market...”

There's also the whole climate change issue, as our vegetables are flown halfway around the world.”

In alignment with findings from the literature describing community gardens as sites with indirect benefits to the environment, Blackshear community garden was observed to function as a site for environmental education (Blake and Cloutier-Fisher 2009). One gardener at Blackshear described her role as a teacher in the garden:

“Well the other piece of it is I teach kids and I bring them to the garden. So we get to grow food here and we help take care of the chickens here and they love it... It’s a huge part of the education that I want them to have is growing food, and knowing neighbors, and animal husbandry, and how the systems are connected. Like, ecologically but also with the people, umm, and so that’s a big motivating factor.”

In addition to serving as a site for local food production and education, Festival Beach included a focus on more direct environmental benefits. One gardener described the projects underway:

“I’m way into all the habitat stuff, you know creating habitat for wildlife. I’m trying to get a pond in here... cause I’m trying to get, you know, places with water access for all the wildlife... Of course we’ve got our rainwater... rain gardens. So we get all the overflow off the residential tower, off the parking lot, it all comes through here, so our goal is to keep it all on the land... we dug this big old deep rain garden and it holds water, so water soaks in slowly instead of flooding.”

Similarly, a plot at Sunshine garden was described by neighboring gardeners as belonging to “the bird guy”, because all of the plants in that plot are chosen for the benefits they provide to wild birds. Nevertheless, concern for the direct ecosystem services of garden spaces, though mentioned by some gardeners, was not a strong motivation for gardeners as a whole.

*Relaxation and Recreation*

The assertion that gardening can be a relaxing and enjoyable recreational pursuit is well supported by the responses of community gardeners in this study. Community gardens serve as places where people can go outside and unwind or simply enjoy the pleasant surroundings. One gardener at Alamo garden described the garden as a place where he could ‘de-gas’ before going home after a stressful day in the office. Many gardeners described their involvement in the community garden as welcome relief from an office work environment. Three men at Sunshine garden provided the following illustrative quotes:

“[Gardening is] more fun than sitting at a desk typing at a computer.”

“[I]t’s nice to get out and do something really concrete after working in an office.”

“What I do for a living is almost 90% in my head, and I’m not sure I ever see the outcome, so it’s nice to come here and put in two hours and be able to see an immediate difference.”

When asked to identify the most important reason for her participation in the community garden, one gardener described gardening as

“a productive de-stressor...I have a stressful job and so this is, uhh, kind of a relaxing, productive, enjoyment ... the relaxation and joy of growing something...is my main motivation. You can buy [vegetables] at the grocery store or farmer’s market.”

Other gardeners were more interested in simply enjoying the outdoor setting and pleasant environment. One gardener at Blackshear said:

“[i]t’s nice to be outside, too. It’s like kind of relaxing and yeah I just like coming out here sometimes...even if I just like, walk over here and like, pick a couple weeds and then like, sit for a while its just nice, nice atmosphere.”

A gardener at Sunshine was more succinct, saying, “[w]hen the weather’s good, I find it relaxing.”

### *Psychospiritual Benefits*

Spiritual practice or awareness as well as an overt concern with mental health and functioning are related to relaxation and recreation, but are considered separately in the literature as well as in this study. These psychospiritual motivations include the therapeutic benefits of both gardening and natural environments, as well as the role of gardens as sacred spaces. An elderly gardener at Sunshine described her motivations for gardening by informing me that “[t]here’s something in the dirt that’s a chemical, that they give antidepressants... [g]ardening keeps the mind alert and healthy.”

A younger gardener at Sunshine reiterated this sentiment, saying, “It’s really...therapeutic. I mean that’s the reason I do it more than anything else.”

After stating that her most important reason for gardening was “mental health”, a gardener at Sunshine elaborated by saying, “it’s like... it’s literally standing on dirt, I think that is what it is.” The importance of touching dirt was mentioned repeatedly by gardeners and is illustrative of the role gardens play as places where people who have become disconnected from material reality by contemporary American culture can go to experience their bodies and reconnect with the material world through creative action. When asked why he enjoys gardening, one man at Sunshine responded: “I like the act of creation, seeing the results of my work... I find that really satisfying.” He was emphasizing the fact that gardening is a physical activity and produces a tangible,

material result, linking him corporeally and emotionally to not only the produce, but the activity of gardening and to the space and place of the garden.

Gardeners also described more overtly spiritual motivations, with one at Alamo saying, “I also, I’ll pray while I’m out there... connect to God while I’m out there, I pray while I’m gardening.” A gardener at Sunshine voiced a similar view, “I feel closer to God [at the garden] than a lot of people get at church.” Community gardens thus offer gardeners a setting in which to access or nurture their mental and spiritual selves.

### *Nutrition and Food*

Gardeners’ concerns surrounding nutrition and food include the perceived purity of garden produce, its health benefits and superior taste relative to store bought produce.. Comparing garden produce with commercially available food, one gardener at Blackshear emphasized the purity of garden produce, saying, “[i]f you cook something from the garden, you’re not going to put 15 preservatives in it.” Other gardeners were more concerned with more conventional notions of food safety:

“It’s nice to know where your food is coming from and that... whatever you’re putting into it is what you’re getting. You’re not getting the chemicals and whatnot that could be coming from the grocery store, and hopefully not the salmonella, e-coli, all those things.” (Deep Eddy)

Concern for health and nutrition was thus oriented more towards rejecting the undesirable aspects of conventionally grown or purchased food in favor of garden produce, rather than on adding fruits and vegetables to a diet otherwise lacking in such foods.

Several gardeners referred to their involvement in other alternative food networks including farmer’s markets and local produce delivery services prior to being involved with the community garden, possibly indicating a higher than average level of vegetable

consumption and a more discriminating palate. The idea that community gardeners are vegetable connoisseurs is supported by the fact that the superior taste of fresh garden produce, especially tomatoes, was far more frequently mentioned than the direct health benefits of the food. Some gardeners expressed an unwillingness to even purchase conventionally grown food, lamenting its poor quality. At Sunshine, a gardener said, “I grew up in a country, a different country where there were just tremendous vegetables available all the time and that’s lacking here.” Referring to garden produce, another gardener, also at Sunshine, said, “[t]he quality is much better, it’s fresher, you know the background of it... You can’t buy the same taste.”

Grocery stores were viewed by some as selling old food, with one gardener at Deep Eddy saying,

“[a]t the grocery stores you tend to get stuff that’s been picked a week or two weeks by the time you get it. And here most of the things that we eat, about half of what we eat comes out of the garden, most of that is the stuff that we picked that day [and] you can tell a big difference... We wouldn’t be here if we weren’t growing food.”

Montopolis Community Garden, which is located at a community health clinic and run by a professional nutritionist, has as a primary goal providing nutritious produce for low income clients. It was not included in this study because, despite the efforts of dedicated staff, none of the clinic’s clients have plots in the garden, indicating an unwillingness or inability to devote time and energy to the activity. Garden produce is usually more expensive in terms of time, labor and purchased inputs than conventionally grown produce from the grocery store. Despite the perceived superior quality of garden produce relative to conventional produce among gardeners, conventional produce can be a substitute for garden produce, especially for people with limited resources. Community

gardening is largely a recreational activity; people who do not have a lot of free time or money may not prioritize the benefits of community gardening relative to other pursuits.

### *Cultural Identity*

To separate out cultural identity as a category for motivation is problematic because “all human activity is culturally encompassed (Johnston et al. 1994).” In that sense, all gardeners are motivated based on the values of their culture. This category then is meant to describe instances in which a gardener mentioned a family or ethnic tradition as important in the decision to join a community garden.

Several gardeners came from rural backgrounds, including one man at Alamo garden whose explanation of why he has a community garden plot was,

“I’m from east Texas and...I’m used to being on a bunch of land...My dad had a garden... his family before that were all farmers so I’m kind of used to being around it... so I kinda wanted some of my own.”

At Sunshine, a woman from rural Indiana described her community garden plot as a place where she and her partner could continue an activity she had done with her family growing up, despite the physical distance:

“And I think it all goes back to, like he said we grew up in kind of rural areas, of being able to do things that are somewhat like, well, considering that we’re from Indiana and down in Texas and pretty far away from our family.”

A gardener at Festival Beach described her involvement in the community garden as a continuation of a Mexican American tradition of community activism at the local scale. She described in detail how her mother and grandmother would feed impoverished families in their neighborhood, lead a movement to construct a library within walking distance for their children, and held a community march to move their church when it

was pushed out of downtown by wealthy Anglos. Though she and her family are new to gardening, she cast her participation in the community garden as part of a continuous family and ethnic tradition of social activism.

At Festival Beach garden, there is a section of the garden set aside for international refugees. One of the refugees was a young man whose extended family were all previously farmers in Nepal but had immigrated to Austin. The family members share several plots. Their involvement in the garden was facilitated by a local YMCA and allowed them to meet other international refugees in the garden and share gardening techniques from their home countries. The primary purpose of his family's involvement was to "pass the time" while adjusting to their new home. When asked whether he was able to use the skills or techniques of farming in Nepal at the garden, he explained that the climate was too different and that they had had to learn new gardening practices. Although the family comes has an agricultural heritage, the family member interviewed did not describe their participation in the garden as a continuation of that heritage.

### *Social Interaction*

Community gardens are places where people go to build and maintain relationships, express their political ideals, and learn from one another. Gardeners give produce to friends, family and coworkers, cementing those relationships, and undertake communal projects to improve the garden and the surrounding communities. At Alamo garden, one man explained the social importance of the community garden:

"It makes you feel like part of a community...Establishing roots somewhere is important...It wouldn't be like that fun to have just something growing in your garden that you two minutes go put water forget about it till next whatever, you

know... Here you talk to people, you have community labor...other people advise you...have workshops.”

His focus on the fun of social interaction, the importance of communal labor, and the value of advice from other gardeners was echoed in whole or part by gardeners in every garden.

Many gardeners also got involved in their community garden at the request of a friend or family member. At Deep Eddy, a graduate student who lives part of the year out of state described how his friend’s involvement spurred his own participation:

“Given my transient nature, I probably would not have tried to get a community garden plot...I’m doing it because [my friend] has the plot already.”

Relationships may serve as an initial motivator, but the importance of the gardens themselves to gardeners can grow with time. A gardener at Sunshine who gardens with her terminally ill sister said this:

"At first I didn't think I would be able to continue gardening here without her, but then the garden's really important to me too. It's definitely tied up with her."

Still other gardeners use the garden as a space for political or ideological expression. At Blackshear, a gardener described a vision for an urban form based on proximity to food production:

“If I could have a city a different way, it’d be much more like what you see in, I don’t know if in exclusively Europe, but where you have really tight urban areas and then you have easy access to places like that grow food like on farms, whereas like here there’s some farmland that’s not too far away...[but] most of it’s just given to the urban sprawl. If everyone could be within walking or biking distance to a farm... that would be awesome.”

Community gardens are, however, also spaces where people go to be alone, where they can engage in individual activity and escape from the social demands of family and

work. Sunshine garden offers such an opportunity to its gardeners. When asked what her most important motivation was, one gardener replied:

"To get away from my husband! It gives me private space and private time, something that I do just alone instead of as a couple. My husband is retired now, so he's at home all the time. So this is something that I do for me. It's mine."

The garden can offer a respite from socializing for working people, too, "[m]y job is very stressful, I'm very like, around people all the time and just, like, the solitude and quiet is nice. (Sunshine)"

An important point made by several gardeners is the potential for the desire for community to be in conflict with the goal of growing food. A gardener at Alamo garden explained how close ties with a local food oriented non-profit limited their ability to choose what plants to grow:

"OK most people's primary reason for being here is they want to grow produce but community is also important and sometimes those things are in contradiction ... and we have to kind of balance those issues...[The organization that owns the land] used to take more of a direct role, and when that was the case we had to be careful like how many herbs or flowers we grew. We had to be primarily producing produce, cause that was their mission statement... but it has been nice since they took a step back and let us... have more autonomy, that now we can grow a lot more herbs and ... flowers."

### *Economics*

Though some gardeners discuss their participation in economic terms, making statements such as "I'm finally able to save money gardening (Sunshine)", these comments were made in the context of describing their level of skill at gardening rather than expressing an economic motive. Only a handful of gardeners mentioned any financial motivations for participating. Such gardeners were focused on saving money

rather than selling produce. One gardener at Festival Beach was focused on her present need for cheap vegetables:

“I want to grow fresh vegetables, it's just too expensive... to buy them. It's a lot of weeks where it's really been beneficial to have access to fresh vegetables cause I didn't have any money to go buy them.”

Another gardener focused on her upcoming retirement and was preparing for a reduced income, "I wanted to have plot after I retired...when we retire we have less income, we need to grow some food. (Sunshine).” A more common view on the economics of community gardening was to make joking reference to how expensive the vegetables would be in comparison to purchased food if labor and material inputs are taken into consideration. The level of skill and hours of labor required to produce large crops of vegetables may serve as a barrier to more people accessing any potential economic benefits of community gardening.

#### *Access to Land and Resources*

People are drawn to community gardens because the gardens offer space for gardening, access to tools, water for irrigation, optimal growing conditions and expert advice from other gardeners. Many, but certainly not all, community gardeners live in apartments and come to the garden because they have no other place to pursue their hobby. “When I got an apartment, I thought I gotta have some dirt,” remarked a gardener at Alamo garden. At Sunshine a gardener said, “Really the main reason is that I haven't had access to gardens for a long time.”

Their desire for access to a garden plot is not limited to the utility of the plot for vegetable production. For apartment dwellers, a community garden plot can provide a

space for connecting to nature or the opportunity to feel a sense of ownership of a place when that is unavailable elsewhere.

“Moving to Austin was the first time that I’ve moved into an apartment, and it’s just kind of concrete shock... After being here about 6 months I really wanted some land underneath me... My parents had 58 acres out in east Texas... I was used to living out in the country (Alamo).”

Other gardeners described their decision to participate in the garden because of the opportunity it provides to feel connected to the earth:

“...it’s become a little bit more of a way to come outside and just connect with the outdoors since I don’t have that access at my apartment (Alamo).”

While some gardeners live in apartments, others live in single family homes with yards, but choose to garden in the community garden because it offers superior growing conditions, especially in the form of soil and light. Many gardeners at Sunshine garden reported having heavily shaded yards, while others simply trusted the soil more because of its history of organic cultivation. With no ambiguity, one gardener at Alamo garden stated:

“The soil here is really good and this garden has been organic for like 30 years so we trust the soil and we trust this space. I mean most fundamentally...that’s why we’re here.”

Likewise, two gardeners at Deep Eddy (one of whom is a member of another community garden as well) agreed with this sentiment:

“This looked like a better place to garden than at home...the soil’s better here.”  
 “I like to grow vegetables, especially tomatoes, and I can’t grow them at my house... If I had good soil and sun at my house, would I be in a community garden? I’m not sure, I might be in one, probably not two.”

At Blackshear, the founder of the garden described his motivation for starting the garden as primarily one of seeing the space where the garden would be as an opportunity rather than a void in the landscape of his neighborhood. Rather than accessing an existing garden, he sought to create a space where others could access the many benefits of a community garden:

“It was mostly the opportunity of the space that attracted me...in my mind it was like ‘Why not create this into a really positive space instead of something that just sits here and is neutral to the health of the neighborhood’.”

Fusing the social and the spatial nature of community gardens creates a landscape rich with expertise and helpful hands. A gardener at Blackshear who relied on other gardeners to water his plot from time to time described the dual importance of gardening space and help from other gardeners:

“Well you know space is the one thing, it’s great to have the space just for [gardening]... The idea of having other people to take care of the plants [when I can’t].”

Although it is possible to learn about gardening from other people without joining a community garden, the physical proximity and concentration of other gardeners in a community garden creates an environment where sharing and cooperation are the norm. Gardeners at every garden mentioned the opportunity to ask plot neighbors for advice as a primary motivation for being involved with the garden. These communities of knowledge are thus spatially constructed and place-bound.

The most important motivations of community gardeners in this study are, for the most part, in alignment with those identified in the literature. The most important pull factors for participation are the superior growing conditions of community gardens compared to participants’ homes, the opportunity to discuss and learn about gardening

techniques with other gardeners made possible by physical proximity, the development of friendships based on a common interest in gardening, the superior taste of fresh garden vegetables, and the opportunity to spend time outside doing something fun, creative and relaxing.

In contrast with community gardener populations studied elsewhere, community gardeners in Austin were found to be well educated professionals, most with sufficient resources to drive private vehicles and buy or rent detached housing in expensive neighborhoods (Baker 2004; Saldivar-Tanaka and Krasny 2004). By and large, they were not found to be socially motivated by economics to otherwise lack access to healthful food choices, to be particularly concerned with the environmental impacts of the gardens, or to be seeking to preserve a fading agricultural heritage. This does not trivialize the importance of community gardens to participants, but it is important to understand who is actually participating and why, if attention and resources are to be directed towards community gardens as solutions to problems like childhood obesity, urban blight or social injustice (Baker 2004; Graham and Zidenberg-Cherr 2005; Gill 2007; Cutter-Mackenzie 2009; Flachs 2010; Corrigan 2011).

#### *Answers to Other Interview Questions*

Beyond the demographic traits and direct questions of motivation, gardeners were asked several exploratory questions. Of particular interest were responses to the following question:

*“Have your reasons for gardening here changed since you started?”*

In fact, many gardeners did express shifts in motivation over time. Among gardeners with shifting motivations, the most common was an expansion of motivations from a desire for gardening space to include an appreciation for the social and learning opportunities available in the community garden. The opportunity to talk and learn about gardening with other gardeners in a garden setting was mentioned in one way or another by roughly three quarters of the gardeners interviewed. These common interest based relationships aren't restricted to gardeners with a lifetime of gardening experience. In fact, some less experienced gardeners tended to emphasize the learning and social opportunities more so than experienced gardeners. Referring to this process, a 56 year old gardener at Festival Beach with less than 1 year of experience said "I didn't know what to grow, where to get it, what time of the year to plant it... It kind of evolved into the garden education." By contrast, a 23 year old gardener at Blackshear Garden who reported over 10 years of gardening experience said she "got the plot just to have a garden." However, "getting to know people [and] hanging out with people" in the garden has become very important to her. In fact, it was a deciding factor when deciding to continue living in the vicinity of the garden, even though she "really wanted to move." These social ties can become stronger with time, evidenced by a gardener who has been tending a plot at Deep Eddy garden for 10 years. "I've built my life around this garden," she reported. "First I just wanted to have a garden...I didn't have the space to do that... the reason for staying...is knowing that I just like this community." Community gardens offer new gardeners the opportunity to interact with total strangers in a relaxed social setting. Relationships are mediated and defined by a common purpose and setting which, unlike work or school, is recreational, not vocational. These relationships increase in

importance with time, and may eventually supersede more utilitarian motivations like food production.

Two exploratory questions asked were intended to uncover biases against specific gardens or general types of gardens. Gardeners were asked how they chose their particular community garden and whether they were aware of any gardens they would not consider joining. Several criteria emerged from the first question, most importantly the physical proximity of the garden to gardeners' work or home, and plot availability. "If I had to travel 30 minutes by bike, it would diminish my participation," reported a gardener at Alamo garden, emphasizing proximity. For many gardeners, though, the decision combines spatial and temporal criteria. "There's one that we can walk to, but its waiting list is very, very long" responded a gardener at Festival Beach. Similarly, a gardener at Sunshine, in describing the decision to join that garden, reported finding "a two year waiting list for every garden [so] I did a grid on the map and decided how far I would be willing to travel... and there were four or five...I got on the list for three."

With rare exception, gardeners either declined to answer the second question or simply said "no". Gardeners who did express a negative preference towards another community garden usually expressed a negative view of the relatively large size and more formal organizational structure of Sunshine Garden. "Sunshine garden...it's really, really huge and I like that this is a small community garden" reported a gardener at Alamo. Echoing these sentiments, another gardener compared gardening at Blackshear with having a plot at Sunshine, "I hardly knew any of the other gardeners and there was a lot of rules [at Sunshine]... if you didn't weed your plot you got a red flag...[so] the smaller scale garden is more my style." Gardeners at Sunshine Garden who expressed

negative preferences did not exhibit any clear patterns. “I don’t want a garden with that much pollution and car exhaust,” said one Sunshine gardener in reference to Deep Eddy, which is located near a busy freeway. Another gardener appreciated the established land tenure of Sunshine Garden, given the level of time and resources that must be invested in a plot to make the soil fertile, saying, “I would be hesitant to [join another garden] because ... the land could be sold.”

Gardeners certainly favor gardens that are near them and which have plots available, but also look for characteristics such as size and organizational culture which match their preferences. Smaller gardens appeal to gardeners seeking a more familiar, flexible community, while larger and older gardens appeal to those seeking a garden with an established and stable presence. Newer gardens are less organized and present participants with the opportunity and challenge of creating an organizational culture from scratch. Sunshine garden’s 30+ years of history has given rise to more rules and regulations, but ensures active participation by all gardeners, giving the garden greater stability and longevity.

## VII. CONCLUSIONS

### MOTIVATIONS OF GARDENERS

No conclusive differences were found in the garden affiliation, demographic characteristics, or spatial patterns of participation of the different motivational groups. Statistical analysis was limited in scope because of the wide range in response frequencies between motivational groups. Some motivations were nearly universal (Food and Nutrition, Social Interaction), while others were very rare (Cultural Identity, Economics). Future research is needed to differentiate between the many gardeners expressing motivations related to food and nutrition, for example those concerned with food safety versus food purity or quality, as well as social interaction motivations. A larger sample of gardeners might allow for more discrete motivational classifications and more robust statistical analysis.

The lack of conclusive statistical results points to a central finding of this study, one which can be introduced through a discussion of the Environmental Quality motivation. Environmental quality was characterized by gardeners' concerns about the impact of their food consumption on ecological systems, with gardeners seeking to substitute food grown in the garden for food from the grocery store. Without data representing the proportion of gardeners' diets originating from the garden and accurate quantification of environmental impacts of comparable foods from the garden versus the

supermarket, gardeners (and the rest of us), are operating largely on the basis of assumption rather than fact. That environmental quality was not mentioned by the great majority of gardeners may stem from the awareness of this reality. Further study of the true environmental impact of garden produce could help guide decision making in this arena, but gardeners did not seem particularly concerned with empirical evidence as the basis for deciding to participate in the garden. Rather, intangible benefits such as friendships, personal expression, taste preferences, and creative endeavor are far more significant drivers of participation.

Such benefits overlap and are difficult to discreetly categorize. Relaxation and Recreation, one of the more common motivations, is conceptually related to Social Interaction, Psychosocial Benefits and Access to Land and Resources. Responses indicate that community gardens are spaces where participants gain access to pleasant surroundings in which to pursue an enjoyable, productive hobby. What makes community gardening enjoyable, though, are the relationships with other gardeners made possible by their proximity in the garden, and the opportunity to creatively engage with and create both the space of the garden and the land itself. Community garden plots become for some participants extensions of the self; both the subject and setting of artistic endeavor, interpersonal relationships or even spiritual practices. Of course, for others, they are merely a patch of dirt on which to grow vegetables. Heterogeneity of purpose and form are therefore a hallmark of both community gardens and community gardeners.

If generalizations must be made, however, it is possible to describe the overall motivation of community gardeners in Austin as a desire for high quality food, accessed

and produced in a pleasant physical setting, amongst other gardeners with whom are shared amicable and mutually beneficial relationships. Returning to Pudup's (2008) "three tributary discourses and movements evincing collective resistance and individual self-improvement that, taken together, animate contemporary organized garden projects (1232)", gardeners in this study were not, for the most part, focused on urban renewal, the therapeutic benefits of plants, or urban ecology, but the more straightforward goals of good tasting vegetables and friendly conversation after a stressful day at the office.

## CHARACTERISTICS OF GARDENS

In contrast to the motivational themes, the different community gardens exhibit very significant differences and variety in terms of the size of their participation sheds and the age of the gardeners. Firth et al. (2011) grouped community gardens by motivation and spatial behavior into interest based gardens, in which members travel from far afield to participate, and location based gardens, which draw members by virtue of proximity. Similarly, two broad types of gardens emerged in this analysis: regional community gardens and neighborhood community gardens.

Regional community gardens, exemplified by Sunshine Garden, are large and diverse, drawing people in from far flung areas of the city. Sunshine, as the largest and oldest community garden in Austin, is made of older gardeners, many of whom have been gardening there for over a decade. Plots are in some cases passed down between friends or family members, contributing, along with development pressures on gardens throughout the city, to lengthy waitlists and a more entrenched organizational culture.

Individual plots at any of the gardens may become a focal point of a participant's understanding of their place in the world. Gardeners will sometimes maintain their plot tenancy despite moving outside of Austin, in a few cases driving upwards of 30 minutes in each direction, passing a number of closer community gardens en route. The benefits of participation in regional gardens outweigh the cost of traveling there. Participants at regional gardens reported being initially drawn by virtue of the garden's reputation as a flagship garden, in addition to, or in some cases in spite of the lack of, proximity and plot availability. In the context the study by Firth et al. (2011), such gardens have themselves become interest groups able to attract members across greater distances.

Neighborhood community gardens, exemplified by Blackshear and Alamo gardens, attract people living in the immediate vicinity, who often happen upon the garden by chance during their normal routines, for example jogging in the neighborhood (Alamo) or simply walking out the front door (Blackshear). Only one of the gardeners interviewed at Blackshear garden lived further than four houses down from the garden; similarly the gardeners at Alamo garden live in close proximity to the garden. Both of these gardens are relatively small compared to Festival Beach or Sunshine, and both the gardens and the participants are younger. They use alternative (walk, bike) transportation to the garden in greater proportion than gardeners at regional community gardens.

The age of the garden also plays an important role in the characteristics of the participating gardeners. Older, more established community gardens such as Deep Eddy and Sunshine have older gardeners. Although the differences are not statistically significant, gardeners interviewed at older gardens also had more overall gardening

experience. There is, however, a positive correlation between gardener age and years of gardening experience for gardeners.

Older, more established gardens have had time to grow in size, develop more formal organizational structures, and retain gardeners with more experience. With time, the gardeners who care most about their plot may move out of the vicinity of the garden, but maintain their tenancy. Thus, older gardens may exhibit an outward diffusion of their participation shed with time. Larger gardens also have larger participation sheds, by virtue of their visibility to potential gardeners. Small gardens, tucked away into neighborhoods, are not as easily found and are less accessible to people living far away. In the case of Austin, Alamo and Deep Eddy are roughly comparable in terms of size, but Deep Eddy is more visible and older, and has a larger participation shed. Blackshear, a young and very small garden, has a participation footprint limited for the most part to a single street. Festival Beach, though the newest garden, is large and visible, located downtown and immediately adjacent to Austin's lone Interstate highway. It was also started by a group of gardeners displaced from a much older garden that was razed by developers, giving it immediate access to a more dispersed population.

Community gardens are sites of food production, but food is just one of several reasons people are drawn to and participate in community gardens. On average, gardeners interviewed in this study spend nearly an hour a day working in and getting themselves to and from the garden. This level of commitment is possible because participation in the gardens fills multiple needs, most notably friendship, creative expression and relaxation, in addition to providing high quality food. If considered only as sites for food production, community gardens are very inefficient in terms of labor and

real estate values. Community gardens are not farms though, and are not subject to the same economic forces that typically push commercial agriculture to the periphery of urban areas. This study concludes that community gardens are best thought of as recreational amenities, like sports fields, art museums or community centers, which may provide little direct economic stimulus but are, nonetheless, valuable and important elements of the urban landscape for the range of benefits they confer. Those wishing to promote community gardens in Austin should focus on what actually motivates gardeners, namely the opportunity to connect with others in a creative and constructive way, rather than promoting gardens for their virtually nonexistent direct economic benefits, uncertain environmental impacts, or minor contributions to food security.

#### FURTHER STUDY

Exploring the spatial patterns and motivations of individual participation in community gardens offers an opportunity to understand the role of these gardens in the lives of participants and their impact on the urban food landscape. While the results of this study have shed light on some of these issues, further investigation with a larger sample size would allow more conclusive descriptions of the differences between motivational subgroups. This study did not investigate community gardens with collectively managed land or gardens affiliated with external communities such as schools or religious groups. Given the diversity among even the gardens included in this study, research into the motivations or spatial patterns of other types of community gardens would likely be fruitful. Likewise, deeper comparisons between regional and

neighborhood community gardens are needed. Finally, further study of the environmental impacts of local food production is needed to accurately understand any potential benefits of community gardens.

## APPENDIX A. SURVEY AND INTERVIEW QUESTIONS

- 1) How many years have you been a gardener? \_\_\_\_\_
- 2) On average, how much time do you spend in this garden per week?
  - a. \_\_\_\_\_
- 3) What is the closest street intersection to your home?
  - a. \_\_\_\_\_ & \_\_\_\_\_
- 4) Which mode of transportation do you usually use to get to the garden?
  - a. Private Vehicle
  - b. Bicycle
  - c. Public Transportation
  - d. Walk
  - e. Other \_\_\_\_\_
- 5) Do you usually travel between your home and the garden directly, or to/from some other place such as work or school? \_\_\_\_\_
  - a. If some other place, where do your trips originate? \_\_\_\_\_

- 6) How long does it usually take you to get to or from the garden? \_\_\_\_\_
- 7) Do you have *access* to a space where you *could* garden, other than at a community garden? \_\_\_\_\_
- a. Where? \_\_\_\_\_
- 8) Do you garden elsewhere? \_\_\_\_\_
- a. Where? \_\_\_\_\_
- 9) How old are you?
- 10) What is your gender?
- 11) What is your final level of schooling or education?
- a. Less than High School
- b. High School/GED
- c. Some College
- d. Bachelors Degree
- e. Master's Degree
- f. Professional Degree
- g. PhD
- 12) What type of housing do you live in?
- a. Detached (Single Family Home, Townhome)
- b. Homeless
- c. Multi-Family (Apartment, Condominium, Co-Op, Dormitory, etc)
- d. Vehicle (RV, Car, Van, etc)
- e. Other \_\_\_\_\_

*Interview Questions*

- Why do you have a plot at the community garden?
- Have your reasons for gardening here changed since you started?
- Of all the reasons you've mentioned, which are/is the most important?
- Why do you have a plot at this community garden, instead of some other community garden?
- Are you aware of any community gardens you would not consider joining?  
Why?

## **APPENDIX B. INSTITUTIONAL REVIEW BOARD EXEMPTION**

Based on the information in IRB Exemption Request EXP2012Y7627 submitted on 04/23/12 16:04:27, this project is exempt from full or expedited review by the Texas State Institutional Review Board.

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## VITA

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