

# **Success on the Ground: Case Studies of Urban Agriculture in a North American Context**

by

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## **AUTHOR'S DECLARATION**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

## **ABSTRACT**

Urban agriculture (UA) is an increasingly popular land use concept emerging in industrialized nations of the world. Although the phenomenon of UA is a common and well-documented form of food production in developing nations of the global south as well as in North America historically, only a small but growing body of literature exists that discusses UA implementation practices in a North American context today.

The purpose of this research was to determine what factors contribute to successful planning and implementation of UA in North American communities. The following questions were addressed: What factors contribute to successful planning and implementation of UA? What stakeholders were most and/or least enabling in achieving success? How do UA projects demonstrate success, and how can these factors be used as a guide for future implementations of agriculture in urban environments? Additionally, how could GIS be employed to aid in spatial decision support for UA planning?

Two North American cases (one in Ontario, Canada, and one in Colorado, USA) were analyzed through open-ended, semi-structured interviews, observations, and other data sources. This study involved the researcher's direct participation with a newly-formed community garden group and the Community Garden Council of Waterloo Region. Findings of this study demonstrate that successful UA planning and implementation is not only the result of several factors and multiple stakeholder involvement, but also that UA—to be successful—should comprise a socially relevant, economically resilient, and environmentally sound system of production.

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## TABLE OF CONTENTS

<b>AUTHOR'S DECLARATION.....</b>	<b>ii</b>
<b>ABSTRACT .....</b>	<b>iii</b>
<b>ACKNOWLEDGEMENTS .....</b>	<b>iv</b>
<b>TABLE OF CONTENTS .....</b>	<b>v</b>
<b>LIST OF FIGURES .....</b>	<b>viii</b>
<b>LIST OF TABLES .....</b>	<b>ix</b>
<b>1.0: INTRODUCTION.....</b>	<b>1</b>
1.1: What is Urban Agriculture? .....	1
1.2: Context for UA in North America .....	2
1.3: A Review of Research in UA.....	5
1.4: Primary and Secondary Research Questions.....	9
1.5: Importance of this Study .....	10
1.6: Chapter Descriptions .....	11
<b>2.0: TRENDS AND FRAMEWORKS OF UA DEVELOPMENT .....</b>	<b>12</b>
2.1: Introduction.....	12
2.2: Agricultural Urbanism .....	14
2.2.1: New Urbanism and Agriculture: Agrarian Urbanism .....	14
2.2.2: Urban Homesteading and Garden Homesteading .....	16
2.3: Civic Agriculture.....	18
2.4: Municipal Enabled Agriculture .....	19
2.5: Continuous Productive Urban Landscapes (CPULs).....	20
2.6: Permaculture .....	21
2.7: Analysis of UA Trends and Frameworks.....	22
2.8: Planning and Implementation – Frameworks of Success .....	23
2.8.1: Implementation is About Obtaining Desired Results.....	24
2.8.2: Implementation Processes Contain Many Variables.....	24
2.8.3: Implementation Success: Existing Methods and Measures.....	27
2.9: Frameworks of Successful UA Planning and Implementation.....	31
2.10: GIS for Urban Agriculture (UAGIS) .....	33

2.10.1: Why use GIS for UA planning?	34
2.10.2: Examples of Using GIS for UA	35
<b>3.0: RESEARCH METHODOLOGIES</b>	<b>42</b>
3.1: Introduction	42
3.2: Methodological Paradigm	42
3.2.1: Constructivism and UA	44
3.2.2: Case Study Research for UA	45
3.3: Data Collection and Participant Sampling	46
3.3.1: Fieldwork for Literature Collecting	47
3.3.2: Choice of Study Areas and Participants	48
3.3.3: Participant-observation in Waterloo	49
3.3.4: Open-ended, Semi-structured Interviews	50
3.3.5: Other Fieldwork Documentation	51
3.3.6: Data Collection and Storage Protocols	51
3.4: Data Analysis Methods and Quality Assurances	52
3.4.1: Open and Axial Coding	52
3.4.2: Cross-Case Synthesis and Comparison	53
3.4.3: Quality Assurance, Reliability and Validity, and Data Sources	53
3.5: Limitations of this Study	59
<b>4.0: DATA ANALYSIS</b>	<b>61</b>
4.1: Introduction	61
4.2: Findings from Waterloo Region	63
4.2.1 Factors of Successful UA Planning and Implementation	64
4.2.2: Social, Economic, and Environmental Improvements and/or Negatives	89
4.2.3: Participants' Most Successful Moments	99
4.2.4: Rival Explanations	101
4.2.5: Conclusion: UA Success in the Waterloo Region Study	102
4.3: Findings from Agriburbia	106
4.3.1: Factors of Successful UA Planning and Implementation	106
4.3.2: Social, Economic, and Environmental Improvements and/or Negatives	128
4.3.3: Agriburbia Participants' Most Successful Moments	134
4.3.4: Rival Explanations	136
4.3.5: Conclusion: Factors of UA Success in Agriburbia	137
4.4: Cross-case Comparisons	139
<b>5.0: DISCUSSION AND CONCLUSION</b>	<b>147</b>
5.1: Introduction	147
5.2: Recommendations for Practice	148
5.2.1: Measuring Success: the PIE Method	151
5.2.3: GIS and Food Planning – A Case from Agriburbia	153
5.2.4: UA Land Inventory and Analysis – A Case for the City of Waterloo	157

5.3: Recommendations for Future Research .....	162
5.4: Conclusion .....	164
<b>BIBLIOGRAPHY .....</b>	<b>166</b>
<b>APPENDIX A: Land Inventory and Analysis Prototype .....</b>	<b>173</b>
<b>APPENDIX B: Vacant Land Inventory Prototype .....</b>	<b>174</b>
<b>APPENDIX C: Study Areas – Key Statistics.....</b>	<b>175</b>
<b>APPENDIX D: Denver Zoning Code Relative to UA.....</b>	<b>179</b>
<b>APPENDIX E: Interview Questionnaire .....</b>	<b>182</b>
<b>APPENDIX F: Web Survey Questions (with results shown) .....</b>	<b>184</b>
<b>APPENDIX G: Overall Case Comparison of Factors (in detail) .....</b>	<b>187</b>

## LIST OF FIGURES

Figure 1.1: New York Children’s Aid Society Roof Garden	Page 3
Figure 1.2: Food Security Map, Denver, Colorado	Page 4
Figure 2.1: Selected Factors Influencing the Evolution of UA in 2001	Page 12
Figure 2.2: A Market Square	Page 15
Figure 2.3: Sketch Plan for the Agricultural Urbanist Southlands Development	Page 15
Figure 2.4: Garden Homestead Diagram	Page 17
Figure 2.5: Diagram Showing two Garden Homestead Lot Layout Alternatives	Page 18
Figure 2.6: Middlesbrough, England CPUL Opportunities Plan	Page 20
Figure 2.7: The PPPP Evaluation Sequence	Page 28
Figure 2.8: Example of Linking Plans and Permits	Page 31
Figure 2.9: Land Survey of Housing in South Vancouver	Page 36
Figure 2.10: Portland UA Land Survey	Page 37
Figure 2.11: Use of Google Maps with Parcel Data Overlays	Page 39
Figure 2.12: Oakland Vacant Land Survey for UA	Page 39
Figure 2.13: Well London’s Active Living Map	Page 40
Figure 3.1: Multiple Case Study Method Flow Chart	Page 46
Figure 3.2: Data Analysis in Qualitative Research	Page 51
Figure 3.3: Multi-sourcing (triangulation) of Data	Page 55
Figure 4.1: Patchwork Community Garden Locations	Page 69
Figure 4.2: Northdale Garden Site Plan	Page 70
Figure 4.3: Northdale PCG Site, View Southeast , May	Page 70
Figure 4.4: Northdale PCG Site, View Southeast, July	Page 71
Figure 4.5: EMS Garden Site Plan	Page 71
Figure 4.6: EMS Garden, View West, July	Page 72
Figure 4.7: Locations of Agriburbia Projects	Page 112
Figure 4.8: Table Mountain Farms Sales Website	Page 113
Figure 4.9: Agriburbia Main Farm	Page 114
Figure 4.10: Example Agriburbia Development	Page 117
Figure 4.11: Agriburbia ‘Steward Lot’ Example	Page 118
Figure 4.12: Portion of Alkire Farm Master Plan	Page 125
Figure 5.1: PIE Method, City of Waterloo	Page 152
Figure 5.2: Statistics and Assumptions for Measuring Potential Food Value And Agricultural Job Creation	Page 154
Figure 5.3: The CFF Process	Page 155
Figure 5.4: Community Food Fraction (CFF) for Douglas County, Colorado	Page 156
Figure 5.5: Conceptual Framework for the Role of Maps in Community Development Programs	Page 161
Figure 5.6: Screen-shots of the CrowdMap Service	Page 160



## **LIST OF TABLES**

Table 2.1: Theoretical Contexts for UA Design and Development	Page 13
Table 2.2: Primary Enablers and Concepts for Five UA Frameworks	Page 22
Table 2.3: Primary Spatial Scales of Five UA Frameworks	Page 23
Table 2.4: Analyzing Why Planning Succeeds	Page 30
Table 2.5: Frameworks of UA Planning and Implementation Success	Page 32
Table 2.6: Concepts and Factors Influencing Successful Implementation of PPGIS	Page 33
Table 3.1: Four Research Paradigms	Page 42
Table 3.2: Tactics Used to Ensure Greater Validity and Reliability	Page 56
Table 3.3: Participant Codes	Page 57
Table 3.4: Sources of Data Defined	Page 58
Table 4.1: Factors Most Contributing to Success (Waterloo Region)	Page 64
Table 4.2: Stakeholders/members in the PCG	Page 76
Table 4.3: Key Resource Factors for the PCG	Page 87
Table 4.4: Factors of Social, Economic and Environmental Improvement In the Waterloo Region	Page 90
Table 4.5: Factors Inhibiting UA Success in Waterloo Region	Page 99
Table 4.6: Participants' Perception of their Greatest Success in Waterloo Region	Page 99
Table 4.7: Factors Most Contributing to Success (Agriburbia)	Page 107
Table 4.8: Stakeholders (and/or clients) of Agriburbia	Page 115
Table 4.9: Key Resource Factors for Agriburbia	Page 128
Table 4.10: Factors of Social, Economic, and Environmental Improvement in Agriburbia	Page 129
Table 4.11: Factors Inhibiting UA Success in Agriburbia	Page 132
Table 4.12: Participants' Perception of their Greatest Success in Agriburbia	Page 135
Table 4.13: Overall Case Comparison of Factors (condensed)	Page 143
Table 5.1: Multiple Criteria Decision Analysis Chart for City of Waterloo	Page 158

## **1.0: INTRODUCTION**

### **1.1: What is Urban Agriculture?**

Today, more people live in urban areas than at any other point in history<sup>1</sup>. This shift toward urbanization presents many challenges for global and local communities. Natural resource depletion, climate change, food insecurity, and the need for more sustainable urban development are major issues facing city planners, urban designers, and communities all over the world. One response to these challenges lies at the crossroads between agriculture and urbanism: urban agriculture. As an increasingly popular land use concept, urban agriculture (UA) has been presented as a solution to part of the concern regarding sustainability<sup>2</sup> of urban environments. Although UA is a common and well-documented form of food production in developing nations of the global south (and historically, North America as well), it has only recently begun to (re)emerge in a North American context as part of community-based local food initiatives (Evans and Miewald, 2010). Much of the literature to-date explains the potential benefits and opportunities of UA within urban contexts, yet only a small but growing body of scholarly research has begun to document what specific factors lead to successful planning and implementation of UA in North American cities (Mendes et. al., 2008). This study contributes to filling that gap.

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<sup>1</sup> As of 2010, over 80% of citizens in both the USA and Canada live in urban areas (CIA, 2011. <https://www.cia.gov/library/publications/the-world-factbook/fields/2212.html>).

<sup>2</sup> See the World Conservation Union (2006) which describes the history and relationship of society, economics, and environment toward understanding sustainability [http://cmsdata.iucn.org/downloads/iucn\\_future\\_of\\_sustainability.pdf](http://cmsdata.iucn.org/downloads/iucn_future_of_sustainability.pdf)

First, we need to understand how UA is defined. One of the most comprehensive definitions comes from Smit, Nasr, and Ratta (2001:1):

*...an industry that produces, processes, and markets food, fuel, and other outputs, largely in response to the daily demand of consumers within a town, city, or metropolis, on many types of privately and publicly held land and water bodies found throughout intra-urban and peri-urban areas. Typically urban agriculture applies intensive production methods, frequently using and reusing natural resources and urban wastes, to yield a diverse array of land-, water-, and air-based fauna and flora, contributing to the food security, health, livelihood, and environment of the individual, household, and community.*

A more concise definition would be that UA is the practice of “growing, processing, and distributing of food through intensive plant cultivation and animal husbandry in and around cities”<sup>3</sup> (Bailkey and Nasr, 2000:6), or “the agriculture that happens to fall within or at the edge of a metropolitan area” (Smit, Nasr, Ratta, 2001:1).

## **1.2: Context for UA in North America**

UA in the United States and Canada has enjoyed a resurgence in popularity, particularly over the past decade. Many popular mediums today (e.g. magazines, websites) now contain periodic features on the topic of UA, and some are even dedicated to it. For instance, Michael Levingston, who founded City Farmer in Vancouver, BC, in 1978, regularly showcases new and emerging UA projects and activities via his website, [cityfamer.info](http://cityfamer.info). Begun in 1995 and updated daily, the City Farmer website (2011) is a good demonstration of the rise of UA across North America and abroad. But the history of UA, particularly in North America, begins with community gardening.

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<sup>3</sup> For this thesis, any reference to ‘urban agriculture’ (UA) is meant to include ‘peri-urban agriculture’ as well.

Community gardening<sup>4</sup> on an urban scale began in the 1890s with the start of the Potato Patch Program in Detroit, Michigan. In response to the economic crisis known as “The Panic of 1893,” Mayor H.S. Pingree established a system of food gardens on vacant city lots in order to provide jobs and food to the urban poor and hungry (Lawson, 2005).

Lawson (2005) points out that community gardens during the period from the 1890s-1990s have all had one or more of the following three characteristics—or themes—in common:

The concept of bringing nature into the city, education, and community engagement and self-help (see Figure 1.1 for example).

Community gardening since the early 1990s

has also included the aspect of ‘community greening,’ which adds an aesthetic dimension to growing food in the city (Lawson, 2005).



*Figure 1.1: New York Children's Aid Society roof garden, 1942*  
(<http://www.inspirationgreen.com/urban-ag.html>)

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<sup>4</sup> Community Gardens are only one type of urban agriculture. The City of Waterloo’s Official Plan supports community garden development as does the Region, and defines Community Gardens as follows: A community garden is a portion of public or private land, no larger than the lesser of 2000 square metres or 10% of total lot area, tended by a group of people, as individuals or as part of club or association for the purpose of producing flowers and/or food for personal and local consumption not-for-profit (COW OP-draft, 2010).

Another context for UA in North America can be realized through the alternative agri-food movements (AAMs) of the late 1980s and early 1990s. AAMs were

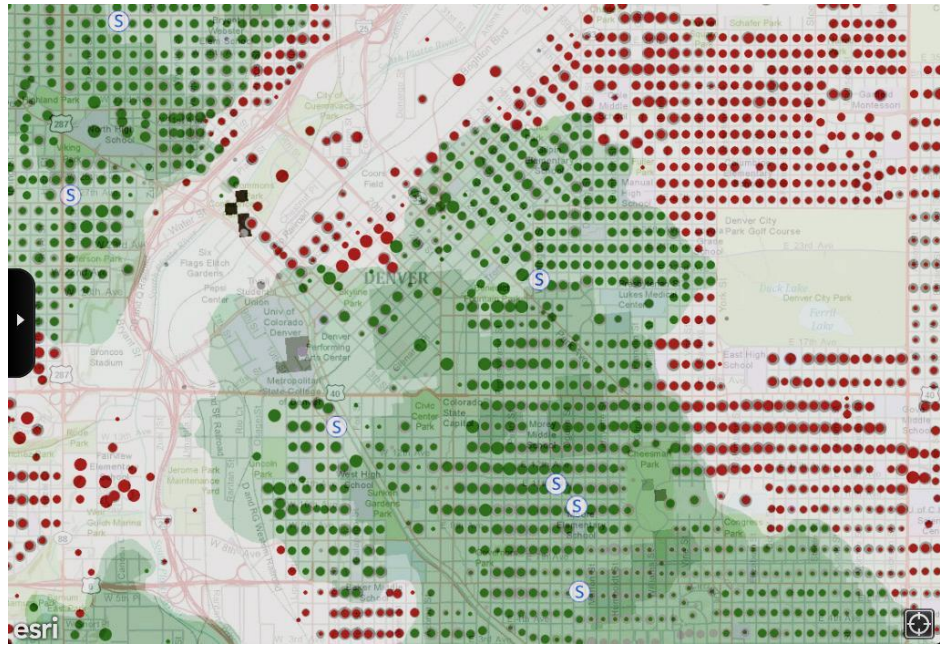


Figure 1.2: Food security map, Denver, Colorado. This map shows food security as determined by supermarket access and travel distance. Shaded areas show the limits of a one mile travel distance to supermarkets (S) by foot or automobile along public rights-of-way (source: ESRI/ArcGIS databases).

largely born out of the concern over access to healthy food and the lack of regulatory transparency throughout large-scale agri-business and government policy, and they embraced the concept that each person or community has the right to define their own food system—a concept known as *food sovereignty* (Friedland, 2010). One recent example of an AAM would be the emerging locavore movement. The Oxford Dictionary defines *locavore* as “a person whose diet consists only or principally of locally grown or produced food.”

Additionally, the issues brought about by *food deserts*<sup>5</sup> have increasingly become a concern and impetus for the development of more robust and resilient food networks in urban areas. *Food desert* was originally a term used in the United Kingdom to describe areas where access to healthy, affordable food was challenging or non-existent, but they can be

<sup>5</sup> For the purpose of this thesis, food deserts are “areas of relative exclusion where people experience physical and economic barriers to accessing healthy food” (<http://www.fooddeserts.org/images/whatisfd.htm>).

found in many places throughout the world (see Figure 1.2). In North America, attempts to map food deserts have shown a disparate food system in many urban, peri-urban, and rural areas across the US and Canada (Forsyth, 2010).

Locally, the City of Waterloo has identified the need to understand and develop policies for UA practices. In 2005, Waterloo Public Health published the *Urban Agriculture Report* outlining the key benefits and types of UA (Mazereeuw, 2005). In 2007, the Region of Waterloo published *A Healthy Community Food System Plan for Waterloo Region* in which the need for promoting UA was identified. The Region of Waterloo has also recently amended their Official Plan to include a preliminary outline for promoting community gardening, although they have no official UA policy (Turner, 2011). Additionally, University of Waterloo Professor Emeritus Greg Michalenko prepared a report for the Community Garden Council (CGC) of Waterloo Region. In that report, Michalenko (2010) outlines some key challenges for the Region with regard to community gardening, including land tenure and location, vandalism, poor soil quality, and lack of water availability and identifies the need for local municipalities to help address these issues.

### **1.3: A Review of Research in UA**

Over the past decade, authors have outlined gaps in UA research and have identified potential opportunities for the future. For instance, in 2000, a survey of 22 U.S. planning agencies uncovered a number of reasons why planners have often not been involved in UA policy development (Mendes et al., 2008; c.f. Pothukuchi and Kaufman, 2000):

- Planners felt that food systems policy was not their responsibility.
- Planners felt that food systems were a rural issue, not an urban one.

- Planners perceived that food systems were a concern of the private sector, not public sector.
- Planners cited lack of funding as a roadblock to implementation of programs and services.
- Planners commented they did not see any problems with existing food systems.
- Planners said they did not know of any groups available to work with regarding food issues.
- Planners reported a lack of knowledge of food issues.

Planners have historically overlooked food systems as a worthwhile or necessary part of the urban environment in North America. Rather, it has mostly been championed by private enterprise, non-profits, and 'grassroots' organizations. Although a lot has changed in recent years as more public servants and other stakeholders take on new roles in UA planning and implementation, there are still several areas in need of more exploration and inquiry (APA, 2011). For instance, Sonnino (2009) highlights the surprising lack of attention to the potential of sustainable development initiatives from social scientists and planners with regard to urban food systems design. Sonnino asks: "What are the practical and theoretical implications of doing research on cities and food" (2009:426)? Additionally, Sonnino states that research on cities and food is likely to contribute to a re-orientation of the academic debate of re-localized food. The planning agenda, according to Sonnino, ought to involve adopting a view of 'localness' as dynamic, inclusive, and flexible instead of monolithic or reactionary. It should also involve understanding trends in urban food strategies which are based on integration of rural/peri-urban/urban landscape relationships as the meaning of 'local' continues to change in our rapidly urbanizing world. Further (but taken from global-south and developing nations perspectives), the International Development Research Center

(IDRC, 2007, online) identifies the need to ask “do all stakeholders share a common goal?” and “what cultural, political, and economic factors need to be addressed?” when assessing success in UA.

There also exists a need to understand the objects (artifacts) of UA. Mougeot (2005) points out that among the differing contexts for UA, we need to identify the character and typologies of UA so they are effectively compared and explained. Mougeot raises several questions for exploration, such as: “is large scale peri-urban agriculture encouraged only, or is UA being promoted at multiple scales throughout the urban area, on permanent land-uses or on flexi-zoning stressing combined and temporary uses?” and “...how is UA defined? What does it include or exclude? What questions are used to generate data and how adequate are they?” (2005:267, 269).

Organizational aspects of UA are also largely under-researched. Formal and informal organizations, in the UA context, need documentation (communities, NGOs, municipal entities, etc.). Although organization itself does not necessarily equate to better performance of UA, organization may help in negotiation with other stakeholders and aid in creating alliances across multiple UA systems and networks (Mougeot, 2005). Also key in the research and development of UA is to understand and analyze stakeholder involvement. Mougeot (2005) states that officials with agricultural backgrounds often stress the food security and production agendas rather than UA’s greening effects and its contribution or conflict to surrounding land uses and activities—suggesting that UA policy cannot be left only to government decision makers.



Participatory (action) research has also been suggested as a viable method to facilitate UA implementation while simultaneously empowering local communities and stakeholder groups (Sonnino, 2009). Additionally, participation can potentially alleviate what Friedland (2010) calls the ‘drop-in, research, drop-out’ paradigm by means of establishing lasting connections with other participants and networks.

Forsyth et al. (2010)—in the context of GIS planning—states that planning for UA will require an understanding of where ‘local’ food is accessed so that proposed UA can be more strategically located. The use of GIS as tool for feasibility and land surveying has been shown to be very effective for encouraging UA planning and development, although not without engaging community partners throughout the entire planning-design-implementation process (Mendes et al., 2008).

Redwood (2009) and others discuss the value of using case studies (albeit from the perspective of UA in the global south) to demonstrate how UA is aiding in food security, economy, and offsetting pollution issues. Redwood points to many questions and issues still in need of exploration, such as the economic benefits of UA (who benefits, who loses?), pollution management and health (tracking produce from 'farm to fork' to ensure hygiene and health safety is being addressed), understanding the peri-urban boundary and its influence on UA, the relationship between UA and climate change, and policy development. Additionally, Redwood outlines two lessons to learn and ways to change our methodological approaches. First, we should not ignore the 'grey literature' that exists on the UA topic; and second, UA research requires an interdisciplinary approach, and a wide variety of research methods can be used.

As discussed, several authors have documented the many benefits of UA and how it can contribute to improving the sustainability of urban settings (Smit, Nasr, and Ratta, 2001; Redwood, 2009; APA, 2011). In order to understand how those improvements are made or experienced, it is important to know what factors contribute to creating those improvements. Therefore, identifying key improvement factors—which can lead to benefits for urban areas and populations across the social, economic, and environmental dimensions—are important areas of study as well.

This study approaches research of planning and implementation of UA from a process- and object-oriented perspective of success. Additionally, it is important to note that municipal planning departments, although they can and do play a role in fostering success, are only one sector of influence on UA. Understanding planning and implementation from other perspectives can contribute to informing not only public/municipal planners what factors necessitate successful UA, but also other audiences across multiple disciplines as well. Thus, understanding the planning methods and strategies of non-government organizations (NGOs) is of particular interest, especially since municipal departments have been largely absent in leading UA development for many years.

#### **1.4: Primary and Secondary Research Questions**

This thesis analyses successes (and/or shortfalls) in UA projects to determine what factors contribute to successful UA planning and implementation. Two North American cases (one in Ontario, Canada and one in Colorado, USA) are studied. The following primary question is addressed: What factors contribute to successful planning and implementation of UA? A secondary part of this study addresses how these factors could be used to guide future

planning and implementation of UA. Additionally, and tertiary to this study, is exploring how GIS could be employed for spatial decision support in implementing UA (“UAGIS<sup>6</sup>”).

Other specific questions asked included: How were key project stakeholders identified and who are they? What role did they have? Were they mostly enabling, why or why not? What precedents, if any, were referenced when preparing UA planning or implementation strategies? What were the major obstacles in implementing the proposed UA project or plans? What factors contribute to success in terms of social, economic, and environmental improvements? What criteria can be used to measure UA, and how can UA success be measured?

### **1.5: Importance of this Study**

As mentioned at the beginning of this chapter, North American communities are experiencing a resurgence of the UA phenomenon. However, only a small but growing body of research has presented what specific factors contribute to success of UA efforts, particularly in the context of Canadian and US cities and more specifically from a case study and participatory research perspective. Further, as many municipal planners across North America have not been leaders in the field of UA and have yet to understand the full connection between planning and UA, specifically with regard to how municipal planning can aid in its planning and implementation (APA, 2011).

With recommendations based on a cross-case study approach, this thesis demonstrates results from analysis that could be used by not only city policy makers, urban

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<sup>6</sup> I use the abbreviation “UAGIS” to describe where GIS is used specifically to assist in planning or implementation of urban agriculture.

planners, or designers, but also community-based organizations, business entrepreneurs and start-ups, or others generally interested in understanding what makes UA successful.

## **1.6: Chapter Descriptions**

For the purposes of this thesis, it is assumed that the reader has little or no knowledge of UA practices across North America specifically. Chapter 2 focuses on UA concepts with an analysis of five prominent trends and theories as well as a review of past approaches to understanding what constitutes successful implementation of planning policies and plans from a municipal perspective. Additionally, concepts of using GIS within the broader context of spatial decision support for community development and agricultural planning are explored. Research methodologies are discussed in Chapter 3 with an emphasis on the importance of case study and participatory research approaches as well as highlighting the methods used to analyze UA activities in the case studies.

Chapter 4 discusses the results of data gleaned from long interviews, participant/observation, and other sources within the study areas, and cross-analyzes these results to obtain a list of factors contributing to successful UA implementation. Lastly, Chapter 5 provides a discussion and conclusion of the findings, recommendations for practice, and recommendations for further research. A prototype GIS-based land inventory and analysis is also presented.

## 2.0: TRENDS AND FRAMEWORKS OF UA DEVELOPMENT

### 2.1: Introduction

Jac Smit, often considered the ‘Father of Urban Agriculture,’ wrote extensively about various types of UA development. Smit, Nasr, and Ratta (2001) outlined some of the key trends and factors influencing UA at the end of the 20th Century (Figure 2.1). Smit, Nasr, and Ratta also pointed out that many factors influencing UA were often simultaneously favorable and

Selected factors influencing the evolution of urban agriculture in the year 2000				
Urbanization	Globalization	Technology	Environment	Food security and health
Population	Lifestyle	Hydroponics	Water	Scale
Infrastructure	Information	Biotechnology	Land and soil	Environment
Land consumption	Marketing	Aquaculture	Climate	Social
Land use and tenure		Energy		Economic
Urban-rural links				
Special groups	Waste management and nutrient cycle	Research and support	Agroterrorism	
Women				
Refugees and displaced persons	Heat			
Immigrants and migrants	Water			
	Organic			
	Inorganic			

Figure 2.1: Selected factors influencing the evolution of urban agriculture in the year 2000. Adapted from Smit, Nasr, and Ratta (2001).

unfavorable. For instance, green spaces within cities could be viewed as an opportunity for UA, yet these spaces may suffer from insecure land tenure, restrictive zoning laws, lack of water availability, or be subject to rapidly changing uses. The typical view of UA as a temporary land use may be detrimental to the development of UA as an aesthetic, productive system within urban open space (Imbert, 2010). From a design perspective, landscape architects should be particularly well-situated to tackle UA planning and design issues as

“heirs to both agricultural and urbanism traditions” (2010:26). Additionally, planners should learn to acknowledge UA as a system that is not only aesthetically pleasing but also productive and sustainable (Imbert, 2010).

To address these issues, a number of development frameworks have been suggested in recent years to help facilitate UA, each with their own conceptual basis (see Table 2). In this chapter, I outline five main frameworks, their core principles, and the policy and design implications for each. I also present four frameworks of planning implementation analysis and their implications for understanding what makes UA implementation successful.

<b>Table 2.1: Theoretical Contexts for Urban Agricultural Design &amp; Development</b>	
<b>Agricultural Urbanism</b>	<p>Framework for integrating a range of sustainable food systems into a community at site-, neighborhood-, or city-wide scales (de la Salle and Holland, 2010).</p> <p>Urban form conceived through the spatial, ecological, and infrastructural implications of agricultural production (Waldheim, 2010).</p>
<b>Civic Agriculture</b>	<p>Locally based agriculture and food production that is tightly linked to a community’s social and economic development (Lyson, 2000).</p> <p>Engagement in an agricultural ‘public work’ with an active role in creating a food system (Chung et al, 2005).</p>
<b>Municipal Enabled Agriculture (MEA)</b>	Promotes the full integration of agri-food systems within the planning, design, function, economy, and community of cities (Condon et al., 2010).
<b>Continuous Productive Urban Landscapes (CPULs)</b>	Urban spaces which combine agricultural and other landscape elements within a strategy of continuous open space linkages (Viljoen, 2005).
<b>Permaculture</b>	<p>Integrated, evolving system of perennial or self-perpetuating plant and animal species useful to man (Mollison and Holmgren, 1978).</p> <p>Consciously designed landscapes which mimic the patterns and relationships found in nature, while yielding an abundance of food, fiber, and energy for provision of local needs (Holmgren, 2002).</p>

## **2.2: Agricultural Urbanism**

Agricultural urbanism is perhaps the broadest of the five frameworks discussed in this chapter. De la Salle and Holland (2010) use the term *agricultural urbanism* to describe concepts of integrating food systems within cities. They highlight strategies for local/urban food processing, marketing, and education, as well as principles of planning for agriculture in urban environments. Several sub-categories of agricultural urbanism exist, some of which are outlined below.

### **2.2.1: New Urbanism and Agriculture: Agrarian Urbanism**

Agrarian urbanism refers to settlements where society is involved with food in all its aspects: organizing, growing, processing, distributing, cooking, and eating (Duany, 2011). Agrarian urbanism focuses not only on the socio-cultural aspects of agricultural production but also on the economic. It seeks to overcome the increasing concern regarding unsustainable food production methods while simultaneously combatting suburban sprawl (Steuteville, 2011). Whereas agricultural urbanism deals with agriculture as only one part of development, an agrarian urbanist development is comprised of citizens whose focus is agricultural production for sustenance and livelihood—an essentially agrarian lifestyle. It should be noted, however, that the New Urbanism concept of agrarianism is a relatively new proclamation from them, and many others have presented ideas spanning several years or decades on the topic (Lerner, 2011).

From a design perspective, Waldheim (2010) discusses the need for further historical studies of UA in the context of agrarian urbanism. Waldheim presents examples of hypothetical design concepts to demonstrate how agricultural production has been used as a determining factor for the form and



Figure 2.2: A Market Square, the “primary social condenser of agrarian urbanism,” New Urban Network. (<http://newurbannetwork.com/images/15044/market-square>).

structure of city planning and design. His study calls for reflections on agriculture in urban settings, particularly with regard to agriculture's role in shaping cities. Waldheim concludes that although some examples (e.g. Frank Lloyd Wright’s “Broadacre City”) may not convince contemporary readers of the validity of organizing cities around agricultural systems, the examples do offer a “useful (if not necessary) exercise in understanding the broader implications of contemporary food culture for the design disciplines” (2010:24).



Figure 2.3: Sketch Plan for the agricultural urbanist Southlands Development, South Delta, British Columbia (Century Group brochure <http://www.imaginesouthlands.ca/downloads/Southlands-eBrochure-July2011.pdf>).



### 2.2.2: Urban Homesteading and Garden Homesteading

Several books have been authored under the title of *Urban Homesteading* spanning back several decades. The concept has recently gained a surge in popularity, even to the extent of copyright infringement claims and legal action taken against the use of the term ‘urban homesteading’<sup>7</sup>. As popularity of the urban homestead idea continues to spread, definitions vary greatly. As an urban re-settlement program piloted by the US Department of Housing and Urban Development (HUD), urban homesteading was defined as a method of “transferring publicly-owned, abandoned property to individuals or families in exchange for commitments to repair, occupy, and maintain the property” (Blackburn et al, 1981:1). More recently, it has been called a “collection of practices, which can be done within a city, with the aim of meeting basic daily needs in a self-sufficient and sustainable way” (Kraft, 2011:4). Additionally, urban homesteading can suggest a certain quality of lifestyle: an “affirmation of the simple pleasures of life” which “reminds us of our place within the greater cycle of life” (Conye and Knutzen, 2008:17). The Dervaes family<sup>8</sup>—who copyrighted the term ‘urban homestead’ (with some controversy)—have 10 points they use to describe the elements of urban homesteading:

1. Grow your own food on your city lot.
2. Use alternative energy sources.
3. Use alternative fuels and transportation.
4. Keep farm animals for manure and food.
5. Practice waste reduction.
6. Reclaim greywater and collect rainwater.
7. Live simply.
8. Do the work yourself.
9. Work at home.

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<sup>7</sup> See <https://www.eff.org/files/LTTDervaes.pdf>

<sup>8</sup> See <http://urbanhomestead.org/urban-homestead-10-elements>

10. Be a good neighbor.

One particularly interesting antecedent to the concept of the urban homestead—as well as to agricultural urbanism in general—is the ‘garden homestead’ (Figures 2.4 and 2.5). Edelman (1942) links garden homesteads to the tradition of allotment gardening, yet garden homesteads have unique characteristics of

their own. First, the homesteader “does possess

a principal outside income from an established source;” second, the homesteader grows “produce principally for home consumption rather than for sale;” and third, there exists the “presence of some sort of community plan and development” (Edelman, 1942:3). Edelman goes on to discuss some of the advantages of successful garden homesteading, such as semi-

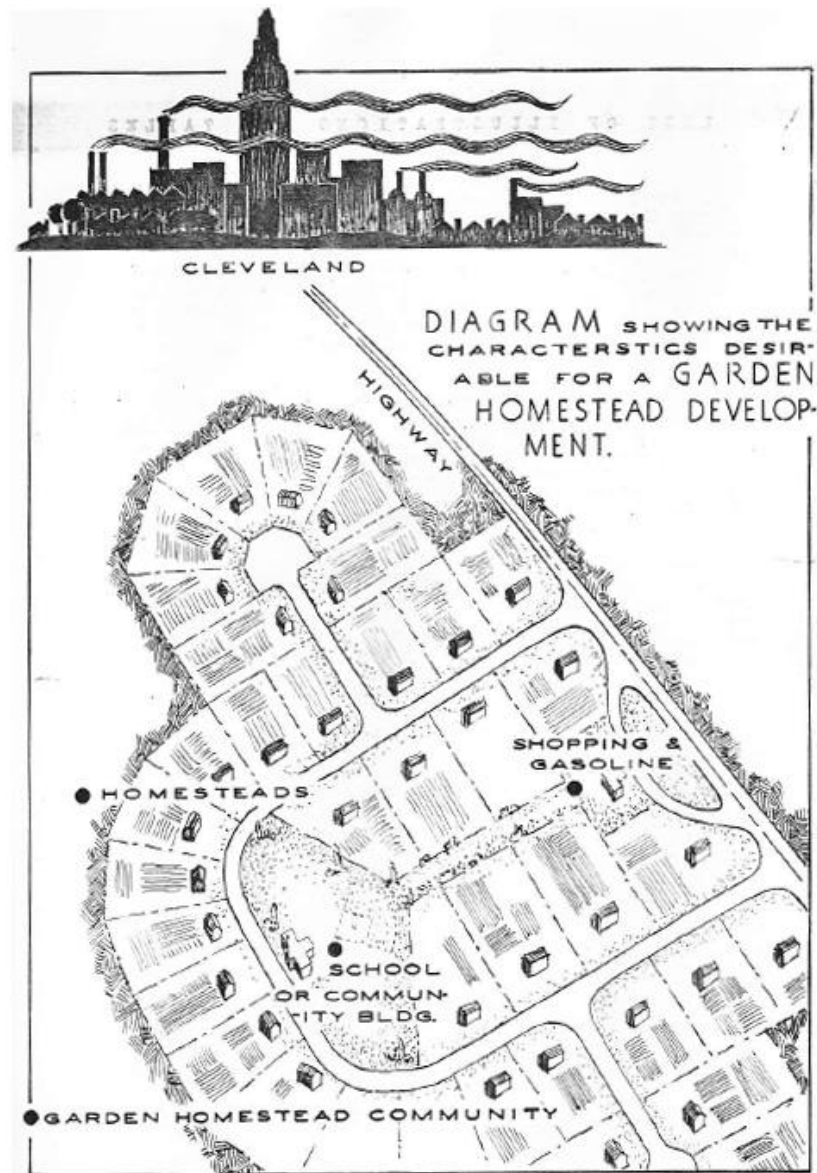


Figure 2.4: Garden Homestead Diagram (showing the characteristics desirable for a Garden Homestead Development in the context of Cleveland, Ohio, Edelman, 1942).

rural living (fresh air and sunshine), a healthier diet, skills development and education, exercise, food security, sense of community, and the satisfaction gained by productive work.

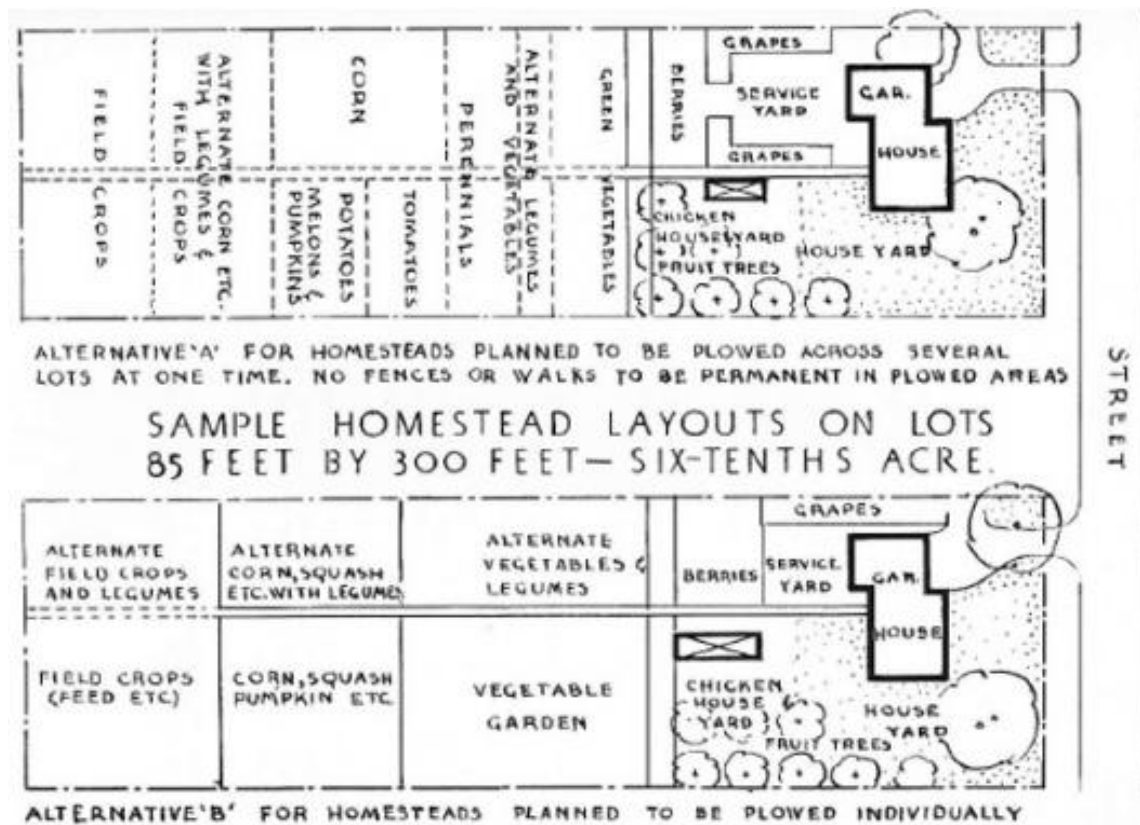


Figure 2.5: Diagram showing two Garden Homestead lot layout alternatives (Edelman, 1942).

## 2.3: Civic Agriculture

For this section, I begin with Lyson's (2000:1) general definition of civic agriculture as "locally based agriculture and food production" that is "tightly linked to a community's social and economic development." I also use the Chung et al (2005) concept that civic agriculture requires an exploration of *public work*<sup>9</sup> and public space to understand 'civic'

<sup>9</sup> Chung et al (2005:100) define public work as work that is 1) "performed by a diverse group of individuals," 2) "for the public good," and 3) "done in a public space that is open to others."

agriculture. Further, Chung et al demonstrate that it is not specific characteristics of influence (e.g. public vs. private enterprise, for-profit vs. non-profit, etc.) that are important in creating *public space*<sup>10</sup>; rather, it is *how* the public is engaged in the activity that is important. Chung et al call for understanding food citizenship, defined as people engaged in creating a food system as opposed to simply acting as a consumer. Thus, civic agriculture can also be defined as engagement in an ‘agricultural public work’ with an active role in creating a food system. One recent and notable example is the town of Todmorden, West Yorkshire, England, where the residents are moving toward producing all their own vegetables and seek to be ‘food independent’ by 2018<sup>11</sup>.

## **2.4: Municipal Enabled Agriculture**

Condon et al (2010) propose Municipal Enabled Agriculture (MEA) —originally conceived in the context of the Greater Vancouver Region—as a framework for solving the issue of urban expansion onto prime, peri-urban agricultural lands and greenfields. The MEA concept suggests policies for planning alongside agricultural land reserves (ALRs) or similar boundaries. Condon et al (2010:109-110) highlight six elements of a strategy they believe can accomplish these goals (without the use of public tax dollars):

- Municipalities establish a planning zone between urban and agricultural or preserved lands, allowing both urban and agricultural land uses.
- Rezone the land for medium- to high-density living on developed portions.
- Protect two-thirds of the land (via covenant and/or land trust) exclusively for agriculture.

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<sup>10</sup> “Public space is not necessarily about a particular place; rather, it describes a particular culture of working together” (Chung et al, 2005:100).

<sup>11</sup>See <http://www.worldchanging.com/archives/011246.html>.

- Lease the agricultural lands to agri-entrepreneurs to farm exclusively for local/regional markets, and mandate only sustainable/organic farming practices.
- Relegate oversight of these lands to a non-government org (NGO), community association, or consultants under deed restrictions which require the uses and practices stated above.
- Endow these lands with funds garnered at the time of land sale to support their agricultural components in perpetuity.

Although there is limited literature or case studies regarding the MEA framework, I use it in this thesis to describe a

concept of UA that is largely premised on government involvement and a government's ability to enact policy which enables public or private enterprise to engage in UA.

## 2.5: Continuous Productive Urban Landscapes (CPULs)

Viljoen (2005) uses the concept of Continuous

Productive Urban Landscapes (CPULs) to describe how UA might be incorporated into existing urban environments based on the historic precedents of English allotment gardens, developing-world agricultural practices, and the principle of multiple uses within urban open

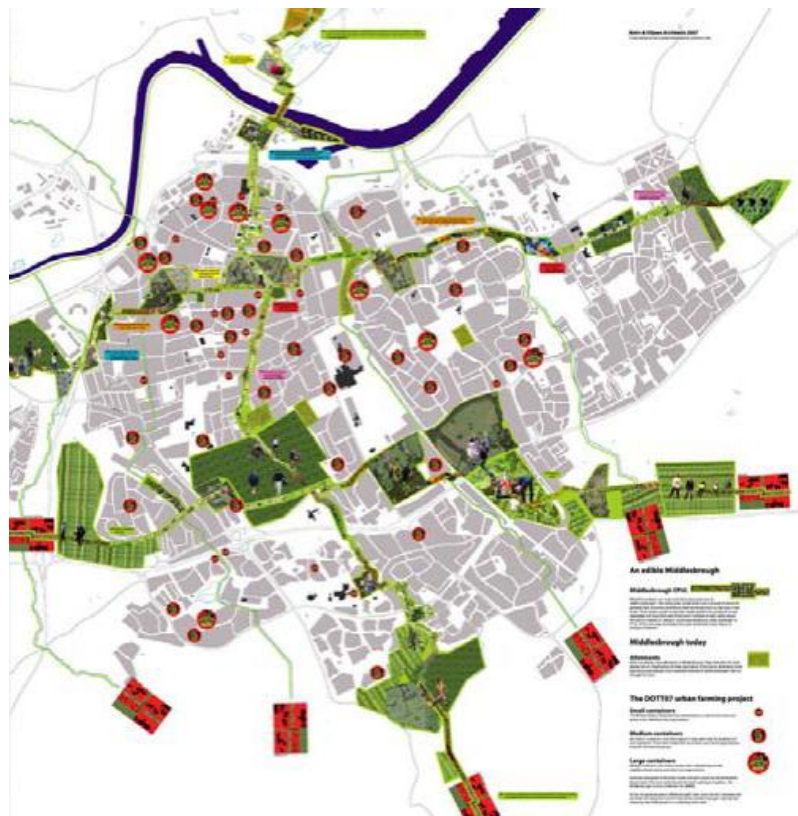


Figure 2.6: Middlesbrough, England, CPUL Opportunities Plan, Bohn & Viljoen Architects, 2007 (Bohn and Viljoen, 2011).

spaces and parks, which are then connected via public space and trail networks (Figure 2.6).

Bohn and Viljoen (2005) point out five key characteristics of CPULs:

- CPULs traverse cities via open spaces, running continuously through the built urban environment.
- CPULs are green, natural and topographical, low, slow, and socially active, tactile, seasonal, and healthy.
- CPULs do not tear down the city but rather build on and over it by overlaying and interweaving a multi-user landscape strategy.
- CPULs will be productive in various ways by offering leisure and recreational activities, access routes, urban green lungs, and space for urban agriculture.
- CPULs will be designed primarily for pedestrians, bicycles, engine-less and emergency vehicles, so as to allow healthy vegetation and varied occupation.

## 2.6: Permaculture

Permaculture draws from the disciplines of landscape architecture, agriculture, and ecology (*Part 1 of 3 – David Holmgren Interview*, Collins, 2010). It promotes first-hand experience and observation as keys to planning and designing more sustainable environments (Holmgren, 2002). Additionally, permaculture has been presented as way to view and live in the world as a “part of nature, fully interconnected and interdependent” (McManus, 2010:169). To live at maximum efficiency, permaculture advocates living in towns or villages to minimize transportation needs and so that food production can be co-operative (Sullivan, 2008). The 12 Permaculture Design Principles (below) can help guide the design process but are not meant to be a substitute for practical and technical understanding (Holmgren, 2004):

1. Observe and Interact
2. Catch and Store Energy
3. Obtain a Yield
4. Apply Self-regulation and Accept Feedback
5. Use and Value Renewable Resources and Services

6. Produce No Waste
7. Design From Patterns to Details
8. Integrate Rather Than Segregate
9. Use Small and Slow Solutions
10. Use and Value Diversity
11. Use Edges and Value the Marginal
12. Creatively Use and Respond to Change

## 2.7: Analysis of UA Trends and Frameworks

Thus far, this chapter has outlined theories found in five specific UA frameworks. It should

be noted that these frameworks may or may not be mutually exclusive. For instance, a community garden project could be considered ‘civic agriculture’ due to its characteristic of public work (engagement) for the public or community benefit.

However, it may or

may not also be considered MEA if the municipality had little or no involvement in the creation of the community garden by means of enabling specific UA guidelines or programs.

<b>Table 2.2: Primary Enablers and Concepts for Five UA Frameworks</b>					
	Municipally enabled	Community enabled	Design concepts	Policy concepts	Lifestyle concepts
Agricultural Urbanism	*	*	*	*	*
Civic Agriculture	*	*		*	
Municipal Enabled Agriculture (MEA)	*	*		*	
Continuous Productive Urban Landscapes (CPULs)	*	*	*	*	
Permaculture		*	*		*

Table 2.2 clarifies the similarities and differences between these frameworks. Further, Table 2.3 displays the spatial scales at which each framework is primarily operative. Although some frameworks are listed as primarily relative only at certain scales, they are not precluded from operating within the other scales listed. Only the *primary* enablers, concepts, and scales are listed in these tables.

## 2.8: Planning and Implementation – Frameworks of Success

This section is a review of literature regarding the topic of *implementation analysis*.

Discussions of what constitutes successful planning and implementation date back several years. Academics and

Table 2.3: Primary Spatial Scales of Five UA Frameworks			
	Municipal scale	Community scale	Individual scale
Agricultural Urbanism	*	*	*
Civic Agriculture	*	*	
Municipal Enabled Agriculture (MEA)	*	*	*
Continuous Productive Urban Landscapes (CPULs)	*	*	
Permaculture		*	*

practitioners of planning have sought to define not only the discipline of planning itself but also ways of measuring success and failure in the planning profession.

First, we need to understand the discussion surrounding *what implementation is* and *what is being implemented*. We also need to understand the distinction between *planning* and the *implementation of plans*. Planning runs the risk of being defined so broadly that it can have essentially no definition (e.g. “If Planning is Everything, Then Maybe It’s



Nothing,” Wildavsky, 1973). The American Planning Association’s (APA) definition of planning is one example of a broad, general description<sup>12</sup>. Similarly, the concept of ‘implementation’ in planning can be so broadly defined that we have no clear guide for measuring its successes or failures. To further explore and understand these concepts, the next sections present some of the most significant theories of implementation analysis of the past few decades, particularly from planning theory and practice perspectives.

### **2.8.1: Implementation is About Obtaining Desired Results**

Pressman and Wildavsky (1973:xiii) began with a definition of *implementation* based on the Webster dictionary and Roget thesaurus; that is, “to carry out, accomplish, fulfill, produce, complete.” Implementation does not mean simply creating the conditions necessary to begin an implementation process; rather, implementation—and its success—is largely relative to an ability to follow through and achieve the goals of a program<sup>13</sup> along a chain of events. A more precise definition of implementation, then, is “the ability to forge subsequent links in the causal chain so as to obtain the desired results” of a program (Pressman and Wildavsky, 1973:xv).

### **2.8.2: Implementation Processes Contain Many Variables**

In the context of implementation process analysis, Mazmanian and Sabatier (1981:5) define implementation as “the carrying out of a basic policy decision, usually made in a statute (although also possible through important executive orders or court decisions).” In

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<sup>12</sup> “Planning... is a dynamic profession that works to improve the welfare of people and their communities by creating more convenient, equitable, healthful, efficient, and attractive places for present and future generations.” <http://www.planning.org/aboutplanning/whatisplanning.htm>

<sup>13</sup> Program: “a system in which each element is dependent on the other” (Pressman and Wildavsky, 1973:xv). It is also important to note that a *policy* (a ‘theory’ of a chain of events between a starting point and an outcome) becomes a *program* once the initial conditions for action are created (Pressman and Wildavsky, 1973).

their view, implementation analysis is meant to identify factors that affect how objectives of statutes<sup>14</sup> are achieved across three broad categories of independent variables with a separate category displaying the stages (dependent variables) of the implementation process. Each of the independent variables may or may not affect the dependent variables throughout the implementation process. The outline below lists these variables (adapted from Mazmanian and Sabatier, 1981:7):

1. Factors (Independent Variables) Affecting the Achievement of Statutory Objectives
  - a. Tractability of the problem
    - i. Ability of valid technical theory and technology
    - ii. Diversity of target-group behavior
    - iii. Target as a percentage of the population
    - iv. Extent of behavioral change required
  - b. Ability of statute to structure implementation
    - i. Clear and consistent objectives
    - ii. Incorporation of adequate causal theory
    - iii. Financial resources
    - iv. Hierarchical integration with and among implementing institutions
    - v. Decision-rules of implementing agencies
    - vi. Recruitment of implementing official
    - vii. Formal access by outsiders
  - c. Effect of “political” variables (non-statutory variables)
    - i. Socio-economic conditions and technology
    - ii. Media attention to the problem
    - iii. Public support
    - iv. Attitudes and resources of constituency groups
    - v. Support from sovereigns
    - vi. Commitment and leadership skill of implementing officials
2. Stages (Dependent Variables) in the Implementation Process
  - a. Policy outputs of implementing agencies
  - b. Compliance with policy outputs by target groups
  - c. Actual impacts of policy outputs
  - d. Perceived impacts of policy outputs
  - e. Major revision in statute

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<sup>14</sup> For this thesis, I equate *statute* as synonymous with *program*.

Additionally, Mazmanian and Sabatier (1983) list six factors to be considered when estimating the likelihood of a program will achieve its goals. Although achieving ‘high’ ratings on all six factors is not crucial to successful implementation, success of the first two factors “must always be met at least moderately well” (1983:41-42):

1. The enabling legislation mandates policy objectives which are clear and consistent or at least provides substantive criteria for resolving goal conflicts.
2. The enabling legislation incorporates a sound theory identifying the principal factors and casual linkages affecting policy objectives and gives implementing officials sufficient jurisdiction over target groups and other points of leverage to attain, at least potentially, the desired goals.
3. The enabling legislation structures the implementation process so as to maximize the probability that implementing officials and target groups will perform as desired.
4. The leaders of the implementing agency possess substantial managerial and political skill and are committed to statutory goals.
5. The program is actively supported by organized constituency groups and by a few key legislators (or a chief executive) throughout the implementation process, with the courts being neutral or supportive.
6. The relative priority of statutory objectives is not undermined over time by the emergence of conflicting public policies or by changes in relevant socioeconomic conditions which weaken the statute’s causal theory<sup>15</sup> or support.

Taking their cue from Rein and Rabinovitz’s three conceptualizations affecting implementation<sup>16</sup>, Mazmanian and Sabatier (1983) also point out that their framework focuses largely on legal imperatives rather than bureaucratic or consensus-building imperatives. Their rationale for this approach stems from the fact that many prior scholars had largely ignored the role of legal variables and that policy decisions in the context of democratic societies ought to be made not by civil servants but by elected officials.

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<sup>15</sup> Here, causal theory refers to “the manner in which... objectives are to be attained” (Mazmanian and Sabatier, 1983:25).

<sup>16</sup> 1) Legal: emphasis on statutory intent; 2) rational-bureaucratic: emphasis on workability, consistency, and organizational maintenance; and 3) consensual: emphasis on reaching a *modus operandi* with major interest groups.

Therefore, their focus on legal imperatives and variables is meant to inform those officials about how they can shape the implementation process.

### 2.8.3: Implementation Success: Existing Methods and Measures

Attempts to measure successful planning have wielded some very complex and detailed methods, such as Alexander and Faludi's (1989) evaluation framework based on five criteria. As a heuristic approach, it seeks to determine if 'policy – plan – program – project' outcomes are positive, negative, or neutral. Definitions of these criteria and relative variables are shown below (1989:135-138):

1. **Conformity** to goals, objectives, policies, plans, programs, etc.
  - a. Was the plan followed, or is it being implemented?
  - b. Are its effects desired?
2. **Utilization**: Whether or not the policy or plan was used as a frame of reference for operational decisions.
3. **Rationality** in conforming to normative requirements in process and method.
  - a. Completeness: Acquisition and use of available knowledge and information, and evaluation of alternative courses of action.
  - b. Consistency: Logical consistency in data, methods of analysis and synthesis, adoption/implementation of strategies, and/or in policy or plan documents, etc.
  - c. Participation: Involvement in policy or plan development of relevant affected parties, and their participation in critical decisions.
4. **Optimality** before the event (*ex ante*).
  - a. Could the strategy of the courses of action prescribed in the policy or plan under assessment be considered optimal?
5. **Optimality** after the event (*post ante*).
  - a. Was the strategy of were the courses of action prescribed in the policy or plan under assessment in fact optimal?

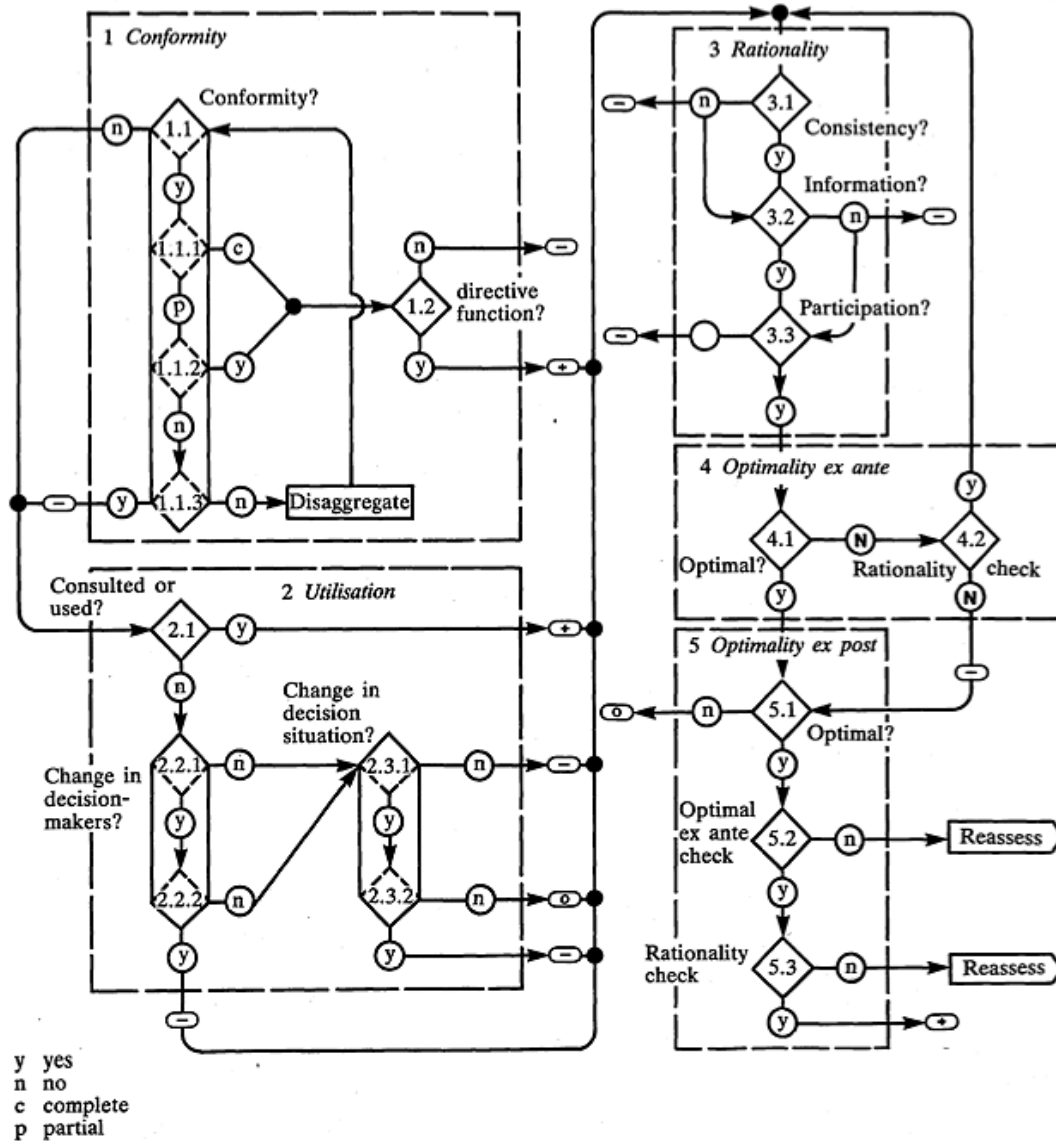


Figure 2.7: The PPPP (policy-plan-program-project) evaluation sequence (see Alexander and Faludi, 1989:136-137, for details of each sub-heading).

Talen (1996a) points out trends in planning evaluation and analysis by highlighting four typologies found in the literature:

- Evaluation before plan implementation
- Evaluation of planning practice
- Policy implementation analysis
- Evaluation of the implementation of plans

The fourth typology listed here is particularly unique since, as Talen (1996a) points out, it deals with the physical, distributive outcome of *plans*<sup>17</sup>. In contrast, the other three do not analyze the extent to which the 'means' affect the 'end' result of a plan. Talen (1996a, 1996b, 1997) argues that planners would benefit from understanding what constitutes successful implementation of plans—what she refers to as object-oriented (1997) implementation analysis—and the ‘what’ and ‘why’ of success as determined by the relationship between plans and outcomes. Process-oriented analysis, on the other hand, would focus on an analysis of plans before implementation and/or policy implementation only.

Talen (1996a) tests a theory of evaluating successful plan implementation by focusing on a particular aspect of planning (the distribution of parks within a city) from a quantitative perspective. She asks “to what degree have plans—guides for future urban development—been fulfilled?” (Talen, 1996a:1). Talen’s methodologies (spatial univariate/bivariate analysis, spatial regression analysis, and comparison of other cities’ success using these same analyses and GIS) can demonstrate where plans have been successfully implemented in terms of access to public facilities<sup>18</sup>. However, Talen points out that her methods are perhaps best left to research centers since “it is unlikely that these methods could be readily adopted by planning practitioners, because of both time and resource constraints” (1996a:90). Additionally, it is important to have a clear set of steps to understand success in planning, as demonstrated in Table 2.4.

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<sup>17</sup> In this context, *plans* are blueprints or drawings which dictate the locations, dimensions, and materials required to construct and install objects in the built environment.

<sup>18</sup> In the case of Talen, 1996a, successes are measured relative to citizen’s accessibility to public park space in the city of Pueblo, Colorado.

<b>Table 2.4: Analyzing why planning succeeds: a progression of required steps (Talen, 1997:574).</b>					
What is planning?	What is success in planning?	What criteria can be used to measure success?	How to measure?	When and where does planning succeed?	Why does planning succeed?

In response to Talen’s call for an evaluation technique focused on “the implementation success of plans” (1996:248), Laurian et al developed a plan implementation evaluation (PIE) methodology, which is meant to assess “the degree to which plan policies are implemented through the application of specified development techniques in planning practice” (2004:472). More specifically, the PIE method seeks to understand implementation as a result of the strengths and/or weaknesses in linkages between plan policies and permitting. Below is an outline of the PIE methodology:

- 1. Selection of issue(s)**
  - a. Identification of the issues of interest
  - b. Identification of the relevant sections of the plan
- 2. The plan and plan policies**
  - a. Identification of relevant policies
  - b. Identification of relevant techniques that address each policy
- 3. The permits**
  - a. Selection of permits that deal with the issue
  - b. For each permit, identification of the techniques used and the policies implemented
- 4. Linkages between plan policies and permits**
  - a. Evaluation of policy implementation in each permit
- 5. Calculation of implementation indicators**
  - a. Implementation breadth: proportion of policies ever implemented
  - b. Implementation depth: proportion that are implemented by each permit (Figure 2.8)

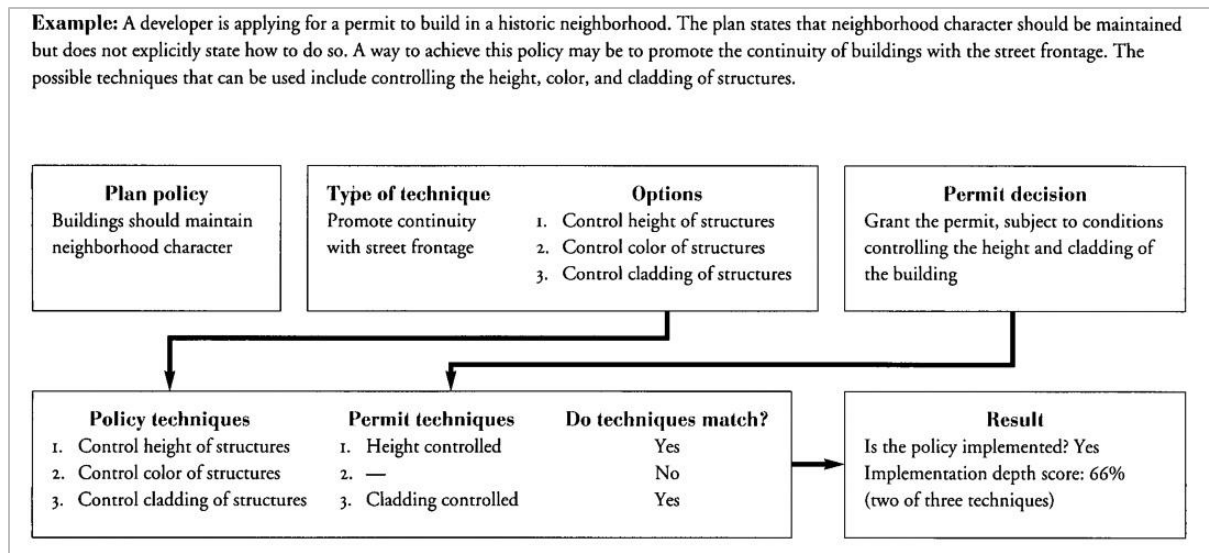


Figure 2.8: Example of linking plans and permits where plan policies do not state specific techniques (Laurian, 2004:475).

## 2.9: Frameworks of Successful UA Planning and Implementation

It is important to note that an object-oriented approach to implementation—not only a policy or process-oriented one—is essential to understanding what constitutes success in UA, since the very actions of UA are so strongly tied to producing and processing agricultural goods in urban environments. On the other hand, simply having UA permits approved and projects built may not necessarily equate to success. Recent attempts to uncover what constitutes success of UA have been demonstrated by the American Planning Association (APA, 2011). The APA lists 16 prerequisites (or, dependent factors) of conditions and resources to be taken into consideration:

- Climate
- Weather
- Light
- Insects and pests
- Land or other growing space
- Secure land tenure



- Healthy, uncontaminated soil or other growing medium
- Water
- Labor
- Capital and operating funds
- Financial and technical assistance
- Agricultural skills and knowledge
- Processing and transportation infrastructure
- Distribution channels
- Consumer demand
- Viable markets

In Table 2.5, I present the beginnings of an operational framework for identifying and analyzing successes in UA planning and implementation (based on Table 2.4 as well as Bailkey and Nasr, 2000; Smit, Nasr, and Ratta, 2001; and the American Planning Association [APA], 2011).

<b>Table 2.5: Frameworks of UA planning and implementation success</b>						
	<b>What is UA?</b>	<b>What is success in UA?</b>	<b>What criteria can be used to measure success?</b>	<b>How to measure?</b>	<b>When and where does UA succeed?</b>	<b>Why does UA succeed?</b>
<b>Smit, Nasr, and Ratta, 2001; APA, 2011; Bailkey and Nasr, 2000.</b>	The practice of growing, processing, and distributing of food through intensive plant cultivation and animal husbandry in and around cities	n/a	16 pre-requisites as listed by the APA (2011), e.g. land, water, funding, market demand, etc.	n/a	When policies enable agricultural uses and incentives, and where communities are actively involved in food system planning	Integrates systems across multiple scales of social, economic, and environmental resources
<b>This Thesis</b>	<b>Chapter 1</b>	<b>Chapter 4 &amp; 5</b>	<b>Chapter 4 &amp; 5</b>	<b>Chapter 5</b>	<b>Chapter 4 &amp; 5</b>	<b>Chapter 4 &amp; 5</b>

## 2.10: GIS for Urban Agriculture (UAGIS)

Although there are some examples of GIS being utilized as a tool for UA development ('UAGIS'), existing scholarly literature on the topic is limited. Therefore, concepts of using GIS within the broader context of spatial decision support for community development and agricultural planning are explored in this section alongside some specific examples of UAGIS.

Government and non-government agencies have increasingly used geographic information systems (GIS) over the past decades to address a range of urban planning issues across North America (Sieber, 2006; Elwood, 2006a, 2006b). The rise of participatory planning and its integration with GIS is well documented (Elwood, 2006b), as are the various factors influencing successful implementations of public participation GIS (PPGIS).

**Table 2.6: Concepts and Factors Influencing Successful Implementation of PPGIS (based on Sidlar and Rinner, 2009)**

	Concept(s)	Factors
Masser and Onsrud (1993)	Two Perspectives: the User and the Application	Usability vs. usefulness, context specifics, varying interpretations across time
Ramasubramanian (1999)	Success as relative to objectives of the organizations involved	Issue clarity, local knowledge, actor relationships, incremental problem resolution
Goodman (1993)	The 'paradox of value' and the 'reward system'	Avoid overestimating the value of GIS, actual benefits should resemble the intent of GIS
Laituri (2003)	Application assessment	Context, connectivity, capabilities, and content
Peng and Tsou (2003)	Quality of services	Performance, scalability, functionality, portability, and security (but does not separate usability from usefulness)

Nedovic-Budic (1997)	Success and outcomes relative to local gov't agencies	Structure of organization, resources available for implementation, motivation for implementation.
Leitner (2002)	Advantages and disadvantages of six GIS typologies	Community-based, university-community partnerships, facilities in universities and public libraries, map rooms, internet map servers, and neighborhood centers
Kingston (2002)	Web-based (Virtual Slighwaite)	Access, training, copyright, 'digital divide'
Sidlar and Rinner (2009)	<b>Application success and the need for adapted evaluation criteria</b>	<b>Success relative to high degree of utility and is context-specific (utility defined as "the degree of success of an application in supporting a particular task" [2009:2021])</b>

*Table 2.6(continued)*

Sidlar and Rinner (2009) touch on several views regarding the utility of mapping tools and their use in planning contexts (Table 2.6). They note the successes of using mapping in community-based participatory planning, their main conclusion being that there is a need for first understanding the contexts of the project and secondly the utility of the application chosen. Similarly, Aditya (2010) charts the appropriateness of mapping techniques and their potential to facilitate participation and group interaction. However, Aditya also points out that no single participatory GIS method can facilitate simultaneous participation and decision-making activities, particularly within the context of top-down and bottom-up collaboration—as is often the case with UA planning (Smit, Nasr, and Ratta, 2001; APA, 2011).

### **2.10.1: Why use GIS for UA planning?**

As both a community-organized and municipally-facilitated land use (APA, 2011), UA is practice that requires understanding the wide range of parameters to implementing UA

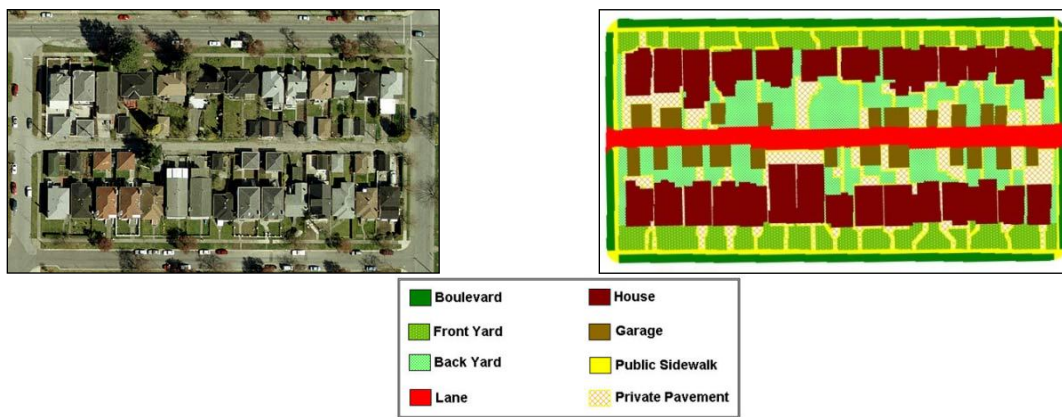
across the urban landscape. From sociological and ecological perspectives, UA could be seen as similar to public parks, open space, or urban drainage systems in that it encapsulates 'green' uses, has a citizen user base, and provides both recreational and ecological amenities within an urban setting. Additionally, UA can contribute not only to a local community's economy but can also address concerns regarding food access and security (Smit, Nasr, Ratta, 2001). With this in mind, it is possible to understand the similarities between UAGIS and other uses for GIS, and therefore why GIS can be used in the context of community- and municipal-based UA planning.

GIS is a potentially powerful tool for measuring food access in both rural and urban areas (McEntee and Agyeman, 2010). To understand where food access issues occur, and help offset any potential health or food security risks resulting from food deserts, GIS tools could be used to learn where people purchase food, how far they travel to get food, what they buy, and ultimately to identify the geography of food—or, the “local food environment” (Forsyth et al., 2010:53)—more accurately. Also, the use of geospatial databases has demonstrated how municipal and regional agri-food systems can be catalogued for reference based on types of food locally produced, economic viability of farm production, and how these farming systems change over time (Ostry and Morrison, 2008). In the following section, some UAGIS projects are presented, including discussions of benefits and barriers to their relative degrees of usability and utility.

#### **2.10.2: Examples of Using GIS for UA**

A very straightforward example of UAGIS has been demonstrated by the use of land surveys. One study (Levenston et al., 2001) shows the use of geo-referenced orthophotos

(aerial photos) to survey a typical city block within South Vancouver, BC. Using a GIS for mapping, the city block was divided into seven land categories. After classifying the polyline/polygon data (line and shape data was digitally drafted manually over the orthophoto), area calculations revealed that 32% of the block (see Figure 2.9) could be considered potential agricultural use areas. That calculation is based on permeable land, but it was also noted that some margin of error should be expected. For instance, ‘ground-truthing’ the neighborhood showed discrepancies between the orthophotos and existing permeable/non-permeable surfaces.



*Figure 2.9: Land survey of housing in South Vancouver (aerial photo, left; GIS analysis, right).*

The land survey method has been employed at the municipal-wide scale as well. In a study by Mendes et al. (2008), two cities—Portland, Oregon, and Vancouver, BC—were compared based on their use of land surveys which mapped the potential of UA. In both cases, university departments (students and faculty) were used to help generate UA land inventories and reports. Portland’s Regional Land Information System (RLIS) and Vancouver’s VanMap were the cities’ GIS applications used to generate data for the survey maps (see

Figure 2.10). Vancouver used *The Diggable City: Making Urban Agriculture a Planning Priority* (Balmer et al., 2005) as a model for their land inventory.

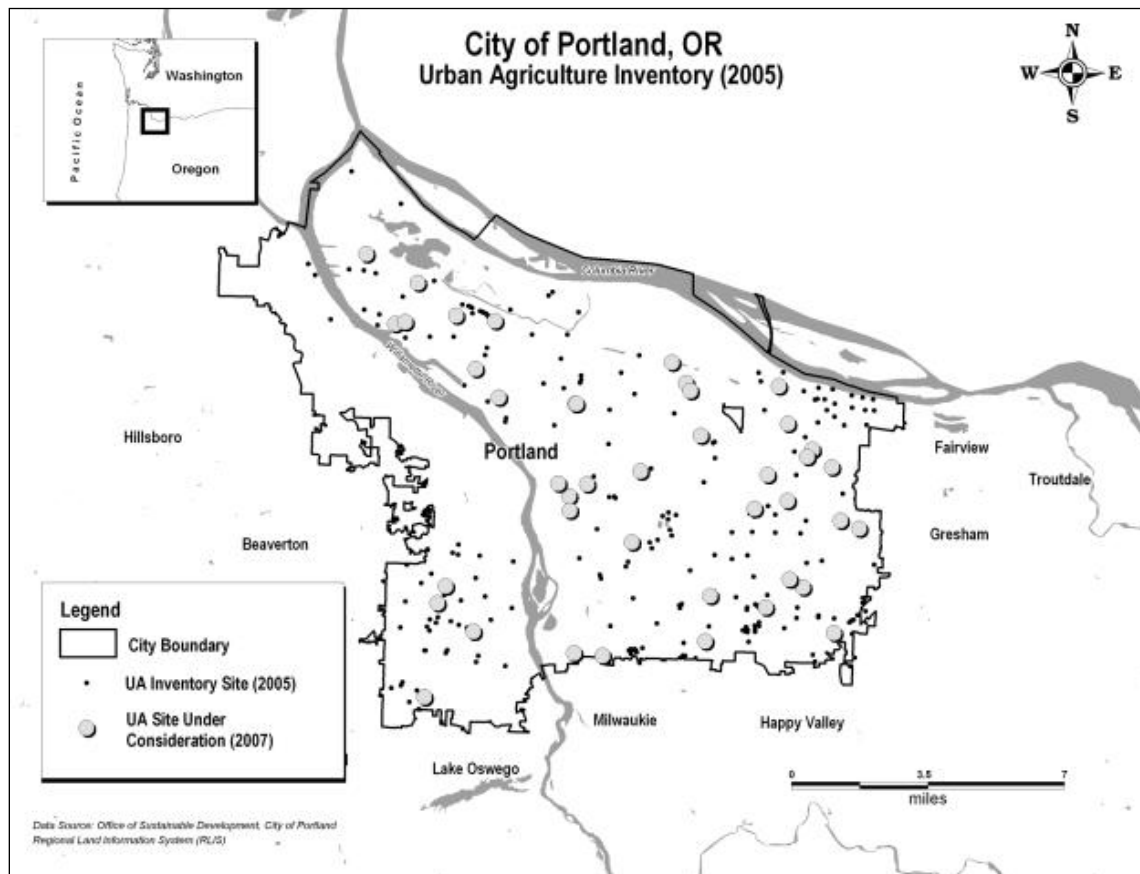


Figure 2.10: Portland UA land survey (Mendes et al., 2008).

The Portland and Vancouver land inventories had similar successes in terms of enabling UA advocacy and policy development. In both cases, community groups and city officials were already aware of the benefits and barriers to implementing UA programs and policy. Additionally, the UA land inventories boosted each city's sustainability agenda previously in place. Mendes et al. (2008) also note some differences between the two cases. For instance, Portland was particularly more successful at using the land survey as tool for UA advocacy since the stakeholders exhibited a larger degree of outreach and publicity

methods<sup>19</sup> during the inventory process, whereas Vancouver had only one city department devoted to the cause and did less to promote their efforts.

Overall, the report by Mendes et al (2008) demonstrates that the land surveys were helpful not only in terms of identifying potential UA land, but also in terms of boosting involvement and collaboration in UA across multiple communities and scales—particularly when community collaboration is built-in to the mapping program from the beginning of the process. Oakland offers a similar example of UAGIS. By combining data from the City of Oakland and Alameda County, California, with USDA aerial photos, McClintock and Cooper (2010) compiled a series of maps showing quantitative data and recommendations for some general types of UA practices. Using these maps, or the ‘land locator’ databases (McClintock and Cooper, 2010), it is possible to strategically plan UA activities based on criteria such as parcel ownership, land cover, slope, soil quality, and acreage (e.g. potential use based on parcel size – see Figure 2.11). Another dimension of UAGIS can be seen when the same data are combined with web mapping tools. Using the Google Maps API, the same team later compiled an online Oakland Urban Agriculture Map, opening the data to a broader audience both within and outside of Oakland in an interactive way (Figure 2.12).

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19 For example: the creation of an advisory council of city and community stakeholders, surveys of local food activists, and a short documentary film created by students.

As with the Portland and Vancouver examples, the authors point out that the land inventory is not the only tool which supports planning and implementation of UA.

Nevertheless, use of GIS to

understand the quality and quantity of acreage available for agricultural uses has been

an essential step toward

realizing the potential of UA in Oakland.

Well London, a project organized by the London Health Commission, has released an online map of

‘active living’ areas in the

London region. The map is

the result of a study of twenty target communities which were identified as lacking facilities and opportunities that support healthy lifestyles (e.g. opportunities for physical recreation,

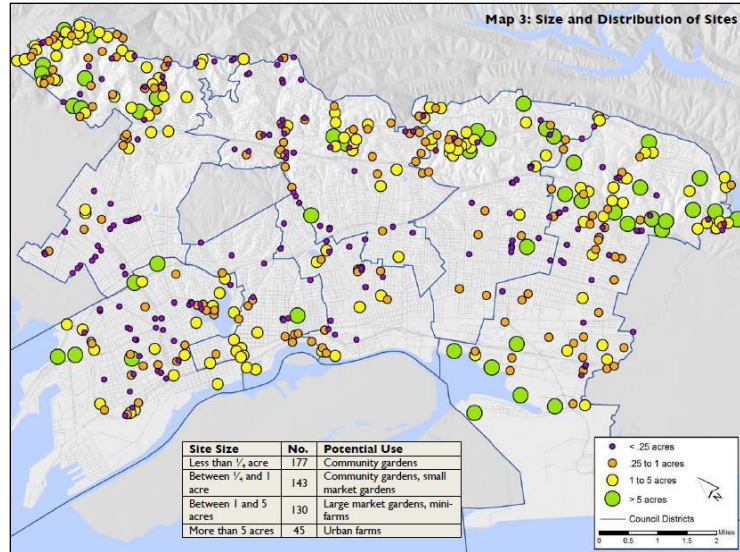


Figure 2.11: Use of Google Maps with parcel data overlays (<http://urbanfood.org/research/inventory.php>).

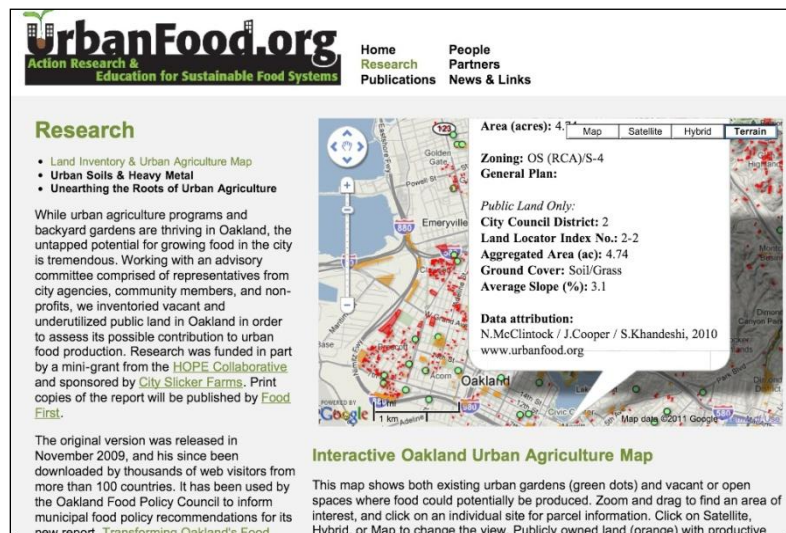


Figure 2.12: Oakland vacant land survey for UA (McClintock et al, 2010).



access to health food options, etc.). Among other things, the Well London project identified a need to create better access to healthy food as well as improved parks and communal spaces, including new community garden design. Part of the outreach strategy for Well London was to deliver maps of active living areas to the residents in the neighborhoods that serve them. In addition to making hand-out maps available, Well London prepared a web map (Figure 2.13).

The Active Living Map shows the proximity and connections between establishments (governmental and/or non-governmental) within five categories of ‘wellness’: Arts,

Environment, Food, Health Advice and Information, and Physical Activities and Social Clubs. Urban agricultural activity, such as

community garden locations, is only one



Figure 2.13: Well London's Active Living Map  
<http://www.activelivingmap.org.uk/>.

aspect of the Active Living Map. This demonstrates the potential of such mapping tools to help government and the general public gain a better understanding of their neighborhoods as a system of networks connected thematically (e.g., by ‘wellness’). Also, a toolbar can be used to measure distances, navigate to street view, or find your own address relative to the wellness areas.

One disadvantage to the Active Living Map may be that it is not easily edited by the same individuals for who it is intended (in contrast to other web-based, freely-editable, open-data maps like OpenStreetMap), requiring instead that users submit a feedback form online to suggest changes. On the other hand, restricting complete public access may help offset potential drawbacks such as intentional user ‘sabotage,’ unintentional user error, or the need for extraneous database maintenance and oversight.

As another land survey technique, remote sensing (RS) offers a possible method for assessing and advancing sustainable urban and peri-urban agriculture possibilities. Addo (2010) illustrates the use of RS to monitor changes in urban spaces and farmlands to aid in planning for sustainable UA policies in developing countries (the context of Addo, 2010: the Accra region of Ghana). A number of survey methods are examined and compared. For instance, it is noted that physical surveying can retain a higher degree of accuracy but is very time consuming. Digital surveys are relatively fast, although expensive to undertake. Also, digitizing historic maps can be reliable, yet labor intensive and take a long time to compile. Lastly, Addo (2010) concludes that when a region’s existing map data is not up-to-date nor in digital format, RS can be used to obtain consistent data over large areas quickly and can be integrated into a GIS environment.

## 3.0: RESEARCH METHODOLOGIES

### 3.1: Introduction

As demonstrated by the previous chapters, several directions and opportunities for research into UA exist. This chapter begins with a discussion of four major methodological research perspectives and continues with a rationale for the paradigm which guided the research methods of this study. The sampling strategies and methods used for data collection and analysis are also discussed. Research design protocols were approved by the Office of Research Ethics on June 30, 2011, with three subsequent revisions approved on November 30, 2011, March 7, 2012, and April 17, 2012.

### 3.2: Methodological Paradigm

Scientific inquiry and research can stem from any number of philosophies, often called ‘world views’ or ‘paradigms’. Creswell (2009) identifies four unique paradigms researchers often adopt in order to help frame why a particular research design method (e.g. qualitative, quantitative, or mixed) is chosen (Table 3.1).

Table 3.1: Four research paradigms (adapted from Creswell, 2009)			
Postpositivism	Constructivism	Advocacy/Participatory	Pragmatism
<ul style="list-style-type: none"><li>• Determination</li><li>• Reductionism</li><li>• Empirical observation and measurement</li><li>• Theory verification</li></ul>	<ul style="list-style-type: none"><li>• Understanding</li><li>• Multiple participant meanings</li><li>• Social and historical construction</li><li>• Theory generation</li></ul>	<ul style="list-style-type: none"><li>• Political</li><li>• Empowerment Issue-oriented</li><li>• Collaborative</li><li>• Change-oriented</li></ul>	<ul style="list-style-type: none"><li>• Consequences of actions</li><li>• Problem-centered</li><li>• Pluralistic</li><li>• Real-world practice oriented</li></ul>

Each of these paradigms may or may not be best suited for qualitative, quantitative, or mixed research methods. For instance, a postpositivist view is most often applicable to research

which seeks to identify and establish numeric measures of cause and effect of a phenomenon, or to test a hypothesis (Creswell, 2009). In contrast, constructivism can be used to generate a hypothesis when one is not present from the onset of the research. Constructivism is also useful when a researcher seeks to understand and define a phenomenon in more depth. Constructivists can also be said to “study the multiple realities constructed by people and the implications of those constructions for their lives and interactions with others” (Patton, 2002:96).

Another model is the advocacy/participatory approach, also referred to as action research (Berg, 2001). Action research is useful when the study involves issues of marginalized or disenfranchised groups or individuals and seeks to bring about social or political change (Creswell, 2009; Berg, 2001). However, it is important to understand the difference between participation as a methodological paradigm and participation as a method of data collection. For instance, Yin (2009) cautions that some definitional flaws exist in the literature where authors have confused participatory/case study methodologies with participant-observer data collection techniques (see also Section 3.3.3 of this chapter).

Pragmatism is yet another paradigm often connected to research where mixed-methods (qualitative and quantitative) are used and/or when answering the question of *what* and *how* is considered important (Creswell, 2009). Pragmatism is not necessarily connected to one type of philosophy or method of inquiry; thus, researchers have some flexibility to choose techniques and methods which suit the needs of the study. Research of the pragmatic kind may also resemble an advocacy/participatory approach when it seeks to instigate change in socio-political contexts through active involvement in solving a problem (Creswell, 2009).

### **3.2.1: Constructivism and UA**

As discussed prior, a gap exists in understanding essentially “what is success” in UA and the factors that specifically contribute to that success from a North American contextual perspective. This research—a study to determine what factors constitute success in planning and implementing UA, as well as how those factors of success can be used to better guide UA development—was largely qualitative and also constructivist in nature. To answer these questions, this research used case study analysis of UA projects (Redwood, 2009) as well as a participatory approach (Sonnino, 2009; Friedland, 2010) in emerging UA projects. Semi-structured, open-ended interviews were conducted with key individuals within the study areas, and other document sources collected were analyzed. A short web survey was also sent to the participants after they were interviewed. Additionally, a more quantitative measure of success of a recent UA implementation in the Waterloo study was formulated based on the PIE measurement of success (Luarian, 2004) as well as the APA’s (2011) list of 16 prerequisites (see Chapter 2).

Tertiary to this study were inquiries into how GIS could be used to aid in the development of UA. Although GIS often involves methods of data synthesis of a quantitative nature, GIS employed for this thesis were aimed at exploring the potential usability and utility of GIS for UA (UAGIS). In this sense, UAGIS as used in this study was more qualitative than quantitative. Nevertheless, use of the case study research approach with integrated qualitative and quantitative data collection and analysis techniques is not without precedent (Yin, 2009). Overall, research for this thesis followed a case study

methodology framed within a largely qualitative, constructivist paradigm<sup>20</sup> to explore what factors contribute to successful planning and implementation of UA.

### **3.2.2: Case Study Research for UA**

The case study research method has been defined in multiple ways. For Creswell (2009), it is one in a set of many qualitative strategies by which a researcher can explore a process or activity in-depth over time. According to Yin (2009), it is a methodology comprised of varied and multiple subsets of strategies and tactics for data collection and analysis—qualitative, quantitative, or a mix of both. For others, it is seen as a method of inquiry which focuses on “describing, understanding, predicting, and/or controlling” an individual, group, industry, etc. (Woodside, 2010:1).

Case study research is well suited for understanding how things happen or operate and when seeking to “attribute causal relationships” of a phenomenon rather than to simply describe the phenomenon (Yin, 1993:31). Figure 3.1 outlines a typical case study flow-chart. For this research, no ‘hypothesis’ was generated from the onset of research. Rather, general theoretical frameworks as uncovered in Chapter 2 (based on different authors’ normative outlooks and discussions of the UA phenomenon) were the launch-pads toward uncovering and exploring success factors in UA as well as understanding how those factors might contribute to UA’s operation in a North American context.

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<sup>20</sup> It should be noted that although I take a constructivist view in this study (e.g. understanding and describing successful UA), one goal of this research is to determine how success factors gleaned from case studies of UA can inform future UA planning, which could be considered more pragmatic by focusing one aspect of this research on active problem solving.

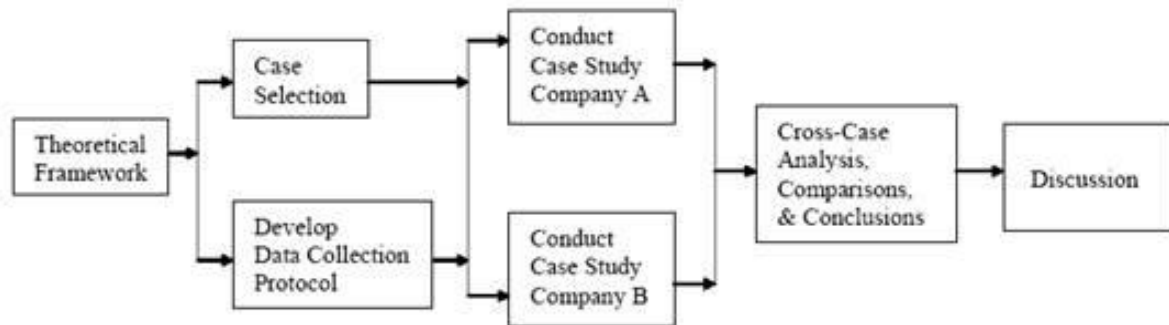


Figure 3.1: Multiple-Case Study Method flow-chart. Adapted from Yin ([http://www.tlainc.com/articl211\\_files/image007.jpg](http://www.tlainc.com/articl211_files/image007.jpg)).

### 3.3: Data Collection and Participant Sampling

Creswell (2009) identifies several methods for collecting data. Qualitative methods include open-ended questioning and interviews, participation, observation, document data, text and image analysis, and interpretation of patterns or themes. Quantitative methods may include statistical analyses, census data, performance data, pre-determined outcomes or hypotheses, and closed-ended questions or surveys.

This study used qualitative methods such as exploring UA literature as well as interviewing key participants within each study area. Although largely qualitative, this research employed some quantitative methods for collecting and analyzing data in order to contribute to deeper, richer explorations and explanations of the case studies (Woodside, 2010). Quantitative methods employed included the use of the PIE method (as discussed in Chapter 2) for measuring the performance/success of a recently implemented community garden in the Region of Waterloo. Lastly, GIS was used to explore how it might aid in planning and implementing UA in the cities of Waterloo Region, taking advantage of parcel

data and multi-criteria / spatial analysis to develop a prototype UA plan for the Region of Waterloo.

### **3.3.1: Fieldwork for Literature Collecting**

The first segment of data collection for this research—the literature review—was represented by Chapter 2. Literature was sourced from online databases via the University of Waterloo (begun in earnest November 2010) but also from my research and volunteer efforts at the newly-opened Jac Smit Urban Agriculture Library at the FoodShare Learning Center<sup>21</sup> in Toronto, Ontario. The bulk of time spent at the library was between May and September of 2011, typically one or two days per week. In addition to research, my tasks included cataloguing new or previously un-sorted library holdings. Several texts were reviewed and/or selected based on themes of planning, design, and implementation, as well as examples of past and current case studies, primarily in North America. A large portion of the library records I viewed were journals and collections of articles, the bulk of which dealt with examples of UA in Central and South America, Africa, and Asia. The library's collection of books offered a diverse cross-section of UA with topics ranging from small-scale, home gardening and composting techniques to regional waste management, sustainability, and large-scale rural and peri-urban agriculture. Most publications or facsimiles thereof dated from the mid-1970s to the early 2000s with a few recent publications in the collection.

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<sup>21</sup> This library is an archive of books, journals, articles, and various texts collected by Jac Smit and his colleagues over the past several decades. The library officially launched in May 2011. See: [http://www.foodshare.net/media\\_archive163.htm](http://www.foodshare.net/media_archive163.htm).



### 3.3.2: Choice of Study Areas and Participants

This research employed *intensity sampling* as a key method of identifying the cases. Intensity sampling can be defined as choosing “excellent or rich examples of the phenomenon of interest, but not highly unusual cases” (Patton, 2002:234). With this method, ‘extreme’ cases are not chosen since they may be too unusual and risk altering the findings relative other case study examples.

Two distinct North American geographic areas were chosen as areas of focus: The Region of Waterloo, Ontario, and the Denver Metro Area, Colorado. The Region of Waterloo was chosen not only due to proximity by residency (both myself and study participants) but also because of the increasing interest in UA across the Region. Additionally, and as mentioned in Chapter 1, the Region has identified the need for supporting UA activity, local food economies, and healthy eating (RW Public Health, 2007).

The Denver Metro was chosen as a study for multiple reasons, including my own experience and familiarity with the area<sup>22</sup>. Moreover, the Denver Metro is home to the Agriburbia group—a key organization participating in this study—who have developed an economic and land planning model for integrating agriculture into large-scale land developments as well as small- and medium-scale urban farms. They have also utilized GIS for measuring and planning their UA activities. Both the Denver Metro and the Region of Waterloo exhibit a great deal of large-scale, rural/peri-urban agricultural activity as well.

In the early stages of research, my interest in being involved at the volunteer/community level in the Region of Waterloo led me to contact the Patchwork

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<sup>22</sup> My experience includes 10 years of practicing landscape architecture and planning in the Denver Metro.

Community Gardens (PCG) group who allowed me to join their team as a volunteer in the spring of 2011. I was also recruited for membership to the Community Garden Council (CGC) in October, 2011, and remained an active member through April 2012. The CGC subsequently became a part of this study and a key source of participants. My research objectives were made known to both the PCG and CGC prior to my full involvement with them.

In addition, the choice of individual participants was based on what Patton (2002) referred to as *opportunistic* sampling. Opportunistic sampling allows for flexibility and on-the-spot decision making while in the field conducting research. This was an especially relevant sampling method since it could not be fully known what opportunities or challenges the PCG might experience from the onset of their work toward establishing new community gardens. Individual participants with the CGC were chosen as a response to my opportunity to work with them more closely as well as in their interest in boosting UA/community gardening activity in the Region. Additionally, the Agriburbia and Waterloo cases could also be considered ‘polar types’ of the same phenomenon, where Agriburbia is an economic land use model and the PCG and CGC promote community gardening at smaller scales that are largely non-profit.

### **3.3.3: Participant-observation in Waterloo**

Participation of the researcher in a study can take many forms. In both the PCG and CGC, I was more active in participating than merely observing. As mentioned, it is important to understand the distinction between being a participant-observer and pursuing a course of advocacy/participation (action) as a research paradigm. Participation is not

necessarily action research, especially when the primary goal of the participation is collecting data instead of instigating political change through direct control of situations. In this thesis, participation has meant *participant-observation* as a method of collecting data to understand the phenomenon of UA and to seek more profound answers to the research questions. My own experience and background as a landscape architect also provided a skill-set that proved useful to both Waterloo Region groups in some circumstances (as discussed further in Chapter 4).

#### **3.3.4: Open-ended, Semi-structured Interviews**

Scientific inquiry of a qualitative nature can often use interview data for understanding, exploring, or describing a phenomenon (Creswell, 2009). For this research, I used open-ended, semi-structured interviews with key individuals (experts) in both the PCG and CGC groups. Face-to-face interviews—one of the most flexible forms of data collection (de Leeuw, 2008)—were conducted. They also offer the opportunity to observe *social interpretations* such as facial expressions, gestures, etc. (Berg, 2001) as well as improvising on-the-spot by using probing questions to explore concepts more deeply.

The interview questionnaire contained three major segments: introductions and background, organizational role and UA planning/implementation processes, and general reflections (successes, shortcomings, etc) on the projects and processes with which participants were involved. Weeks after the interviews were complete, a link to an online survey was sent to the interview participants containing closed-ended rating and ranking questions (see Appendix ‘E’ and ‘F’ for the interview and survey instruments).

### 3.3.5: Other Fieldwork

#### Documentation

In addition to recorded interviews and web surveys, documents collected or created during this research included meeting notes, official minutes or public records, sketch plans/drawings/photos of garden sites, as well as miscellaneous email or memo responses to

action-items/duties with the PCG or CGC to which I was assigned or volunteered. Some documents were collected as a result of the interview process as they were handed over or referred to me by the participants across all study areas and groups.

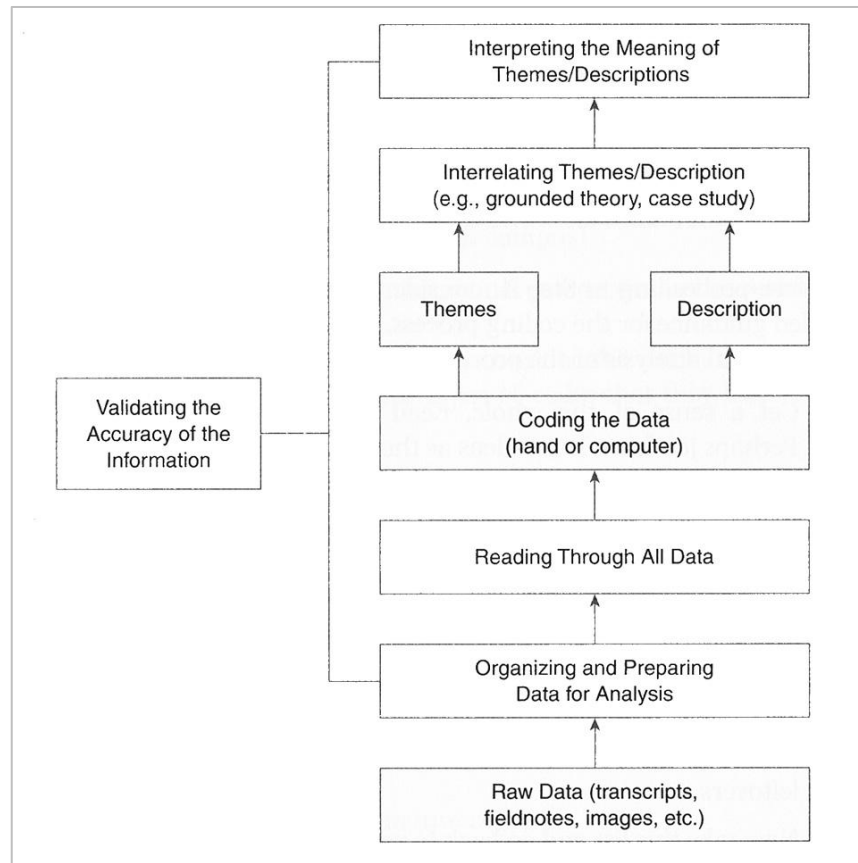


Figure 3.2: Data Analysis in Qualitative Research (Creswell, 2009:185).

### 3.3.6: Data Collection and Storage Protocols

Interviews were audio recorded and then transferred to a desktop computer before being transcribed. Both the recording device and the computer were password protected. All recordings, devices, and documents such as signed consent forms and field notes were kept in a home office under lock and/or on the same password-protected computer (for scanned and

emailed forms). All photographs taken were digital, transferred to computer, and kept under the same protection as all other sources of data.

### **3.4: Data Analysis Methods and Quality Assurances**

Analyzing the data was the next step (Figure 3.2) after completing the data collection and sampling. The general approach was to work from broad concepts to more refined and detailed themes or descriptions. Once the data were organized by type, they were read through and then coded (by hand) based on key factors or contexts explored in the study.

#### **3.4.1: Open and Axial Coding**

In qualitative research, codifying (analyzing) data largely entails two distinct procedures: *open* and *axial coding*. Open coding begins the process of breaking down and categorizing the data into groupings of words or phrases, whereas axial coding reassembles that material, making connections across the broader categories uncovered during the open coding stage (Strauss and Corbin, 1990). Both strategies can and often do occur iteratively throughout the coding process. Codes can be developed from emerging information based entirely on data collected from the participants, from predetermined theories, or a combination of both (Creswell, 2009). Creswell (2009:186-187) identified four general categories researchers can look for when developing codes:

- Codes on topics expected, based on literature and common sense
- Codes that were not anticipated at the beginning of a study
- Codes that are unusual and of conceptual interest
- Codes that address a larger theoretical perspective in the research

For this study, open codes generally fall within the first three since no theory or ‘hypothesis’ was established from the onset of this research. However, the open coding stage did begin with broad, pre-determined classifications, based on broad dimensions from the research questions and the open-ended interview questionnaire (e.g. key factors of success; social, economic, and environmental improvements, etc.) as well as comparisons against the theoretical frameworks uncovered in Chapter 2. Results of the open-coding (words or phrases) associated with participants’ comments were represented in brackets after specific quotations where appropriate. Other data sources analyzed were also similarly coded, and descriptions of those codes are presented in Chapter 5.

#### **3.4.2: Cross-Case Synthesis and Comparison**

In this research, themes (results of coding) were developed and analyzed for each individual case and then compared. Yin (2009) describes this as cross-case synthesis. Yin has suggested that when a modest number of cases are being compared, word tables can be useful in determining if themes or typologies emerge across differing areas or groups. In addition to following Creswell’s steps in qualitative data analysis, word tables were used as a method for cross-case analysis and synthesis in this study (see Chapter 4).

#### **3.4.3: Quality Assurance, Reliability and Validity, and Data Sources**

Although the case study as research method has been scrutinized by some, case studies remain very useful for a variety of reasons. For instance, Flyvbjerg (2006) points out common misconceptions about case studies, such as lack of generalizability from single cases, inability to test theories and only the ability to generate hypotheses, or difficulty in

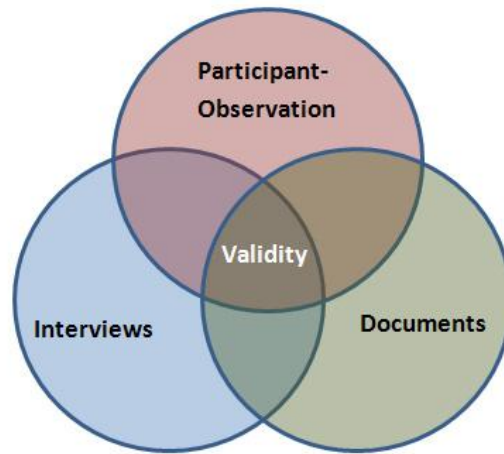
generating theories from specific cases. Nevertheless, Flyvbjerg (2006), Yin (2009), and Creswell (2009) all present arguments and evidence to the contrary as well as providing strategies for ensuring reliable and valid case study analyses. The following section describes the techniques used to create a valid and reliable case study analysis for this thesis.

Tests of reliability and validity largely occurred during data collection and analysis phases of case study research (Yin, 2009; Creswell 2009; and Figure 20). *Reliability* is essentially a matter of consistency (Creswell, 2009); or, the extent to which a technique may yield the same result when applied to the object of study multiple times (Babbie, 1998). *Validity* can be demonstrated by how well measurements of research data reflect ‘real meaning’ of the concepts and themes being presented (Babbie, 1998); and by employing certain strategies like triangulation or member checking (Creswell, 2009). In order to assure a higher degree of validity during data collection, a *multiple sourcing* (triangulation) approach was used (see Figure 3.3). Sources of evidence for the case study analyses included documents gathered about the study areas and from participants, open-ended semi-structured interviews, direct observations and participation in events, and UA project site visits in the study areas. *Member checking* was used for ensuring reliable information was gathered as well as for validating concepts and themes that emerged during the analysis phase. This was done by asking the participants to review transcriptions of their interviews and review/comment on the initial findings of the data analysis. Additionally, sources of

data were identified based on Yin's (2009) 'sources of evidence'<sup>23</sup> and compiled into a *database* to contribute to a more thorough and reliable dataset (Table 3.4).

Threats to validity (internal and external) were dealt with in a variety of ways. For instance, internal validity was ensured via *pattern matching* as well as addressing any *rival explanations* (conflicting/contrasting viewpoints among participants) that may have emerged during the data analysis phase (Yin, 2009). Also, the study participants displayed a range of involvement and expertise on the topic of UA (e.g. emerging or beginning involvement in building a community garden and experienced urban farming practitioners), helping offset threats of *selection validity* (Creswell, 2009) (see Table 3.2).

External validity threats—which are typically avoided during the research



design/protocol phase—were curtailed by selecting participants and cases that share

Figure 3.3: Multiple-sourcing (triangulation) of data sources contributes to valid results.

similar experiences and qualities (e.g. organizations actively engaged in implementing UA). Referred to as *replication logic* in multiple-case study research (Yin, 2009), this can contribute toward the discovery concepts or themes which might be *generalized* analytically into a coherent theory across multiple cases.

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<sup>23</sup> Six sources, including documents, archival records, interviews, direct observations, participant-observations, and physical artifacts (Yin, 2009). For this research, all but physical artifacts are relevant.



<b>Table 3.2: Tactics used to ensure greater validity and reliability in this study (adapted from Yin, 2009)</b>		
<b>Tests</b>	<b>Tactic</b>	<b>Phase of research</b>
Construct Validity	<ul style="list-style-type: none"> <li>• Multiple sources of evidence</li> <li>• Key informants review transcripts and draft report</li> </ul>	Data collection Composition
Internal Validity	<ul style="list-style-type: none"> <li>• Pattern matching</li> <li>• Address rival explanations</li> </ul>	Data analysis Data analysis
External Validity	<ul style="list-style-type: none"> <li>• Replication logic</li> </ul>	Research design
Reliability	<ul style="list-style-type: none"> <li>• Use case study protocol</li> <li>• Develop case study database</li> </ul>	Data collection Data collection

With the exception of the Agriburbia group, all participants remain anonymous in this study. For maintaining anonymity of individuals, the following basic naming scheme was applied: Pn-G (where Pn = randomly assigned Participant number and G = Group). Groups are abbreviated as CGC (Community Garden Council member), PCG (Patchwork Community Garden volunteer or coordinator), and UF (a backyard/urban farmer who has also been connected to the Waterloo Region community garden network). Thus, P1-PCG would mean “Participant number one, from within the Patchwork Community Garden group.” Agriburbia members are abbreviated first initial and last name. Table 3.3 outlines the participant’s years of experience with UA.

<b>Table 3.3: Participant codes</b>	
<b>Participant</b>	<b>Number of years involved with UA organization<sup>24</sup></b>
<b>Waterloo Region</b>	
P1-PCG	1.5
P2-PCG	1.5
P1-CGC	3
P2-CGC	4
P3-CGC	3
P4-CGC	3
P5-CGC	8
P1-UF	10+
<b>Denver Metro/Agriburbia</b>	
J. Loyd	1
J. Redmond	10+
Q. Redmond	10+

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<sup>24</sup> Includes the participants' involvement with their current and primary UA-related organization and does not include time as a hobbyist or with other groups.

<b>Table 3.4: Sources of Data Defined</b>		
	<b>Agriburbia / TSR Agristruction (Denver Metro)</b>	<b>PCG and CGC (Waterloo Region)</b>
<b>Documents</b>	<u>Received from Participant(s):</u> <ul style="list-style-type: none"> <li>• Douglas County Food Baseline Study &amp; Appendices</li> <li>• 84<sup>th</sup> &amp; Alkire, City of Arvada RFP, and email comment/response</li> </ul>	<u>Received from Participant(s):</u> <ul style="list-style-type: none"> <li>• Growing Inclusive Community Gardens (Popovich, 2011)</li> <li>• Needs and Asset Assessment (Wormsbecker, 2008)</li> <li>• Benefits and Barriers to Community Gardens in Waterloo Region (Dow, 2006)</li> </ul> <u>Online sources and from handouts:</u> <ul style="list-style-type: none"> <li>• CGC meeting agendas and minutes (past and recent)</li> </ul>
<b>Archival Records</b>	<u>Online sources:</u> <ul style="list-style-type: none"> <li>• City &amp; County of Denver Zoning</li> <li>• WFAE 90.7 FM, Charlotte, NC – Audio-recorded interviews with Quint Redmond (2009)</li> <li>• Agriburbia website</li> <li>• Farmstead, North Carolina website</li> <li>• Denver Public Schools article archives</li> <li>• Online articles (Lerner, 2011; McMahon, 2010)</li> </ul>	<u>Online sources:</u> <ul style="list-style-type: none"> <li>• Region of Waterloo Official Plan (draft 2011/2012)</li> <li>• City of Waterloo Official Plan (2010)</li> <li>• CGC website</li> </ul>
<b>Audio-recorded Interviews (open-ended)</b>	<u>In person (1) and telephone (2):</u> <ul style="list-style-type: none"> <li>• Three (3) interviews with Agriburbia/TSR Agristruction</li> </ul>	<u>In person (7) and telephone (1):</u> <ul style="list-style-type: none"> <li>• Two (2) interviews within PCG</li> <li>• Five (5) interviews within CGC</li> <li>• One (1) interview with a backyard/urban farmer</li> </ul>
<b>Survey (closed-ended)</b>	Web survey	Web survey
<b>Direct Observations</b>	<ul style="list-style-type: none"> <li>• Photos / site visit</li> </ul>	<ul style="list-style-type: none"> <li>• Photos (See also participant-observations)</li> </ul>
<b>Participant-Observations</b>	<ul style="list-style-type: none"> <li>• n/a</li> </ul>	<ul style="list-style-type: none"> <li>• Assisted planning, building, and gardening at two community gardens (PCG, April 2011 –Oct 2011)</li> <li>• Participation in events and meetings (CGC, PCG)</li> </ul>

### **3.5: Limitations of this Study**

As noted in the previous section, two different organizations across two distinct geographic regions were chosen for case study analysis and comparison. The Waterloo Region study was largely limited to interviews and documents collected from the Patchwork Community Garden (PCG) group and the Community Garden Council (CGC) of Waterloo Region. Thus, community gardening was the UA typology most represented and discussed among participants and within other documents collected for that case. In addition, and due largely to proximity and my opportunity to participate in a community garden as well as on the CGC meant that the data collected for the Region study was more comprehensive. Conversely, the Agriburbia case study data collection was limited to three participant interviews and online document/archive data. This limitation was the result of time and resource constraints, such as the fewer number of Agriburbia employees and their time and availability, my distance from the Denver Metro area (living in Waterloo), and the proprietary nature of their business as a private, for-profit enterprise. Nevertheless, Agriburbia's land use and urban farming models in addition to their use of GIS for planning and designing UA contributes much to answering not only the primary questions but also the secondary and tertiary questions of this research.

In addition, the web survey was limited to only those who I interviewed (11 total), and of those, only six responded. Although I include the survey as an appendix to this study for those who may find it to be of contextual interest or wish to replicate the format or content of the questions, it was not used in the analysis of this study due to the relatively low

response rate. I suggest it not be considered statistically relevant on its own, within this study, or beyond this study.

Furthermore, this research does not necessarily claim to be *statistically* generalizable to a broader population or ‘universe’. What is true for Agriburbia or the Region of Waterloo groups may or may not be true statistically across all of North America, and statistics have not played a major role in this largely qualitative and ‘constructivist’ research which seeks to understand and describe the emerging North American UA phenomenon and the factors contributing to making it successful. However, and as will be discussed in the next chapter, findings from the Waterloo study show that some degree of analytical generalizability can be made more broadly across the community gardening network in the Region. Further, findings from both cases reveal that a certain degree of analytical generalizability to the UA literature, particularly with regard to many of the socio-economic and environmental improvements, benefits, and/or barriers experienced by UA practitioners as well as to the frameworks outlined in Chapter 2.

## **4.0: DATA ANALYSIS**

### **4.1: Introduction**

The structure of this chapter is largely based on the main research questions and the more prominent themes which emerged as a result of analyzing the collected data. To review, the primary research question was “what factors contribute to successful planning and implementation of UA?” Although the results of the interviews with key individuals reveal very rich discussions of those factors, for this analysis I also use other data sources (see Chapter 3, Table 3.4) to further explore and describe successful planning and implementation strategies and success factors.

Results of the data analysis are categorized into sections based on the questions of this research but also on the themes that emerged as a result of analysis. The first few sections are based on themes/topics expected as a result of the interviews and other data gathered, with a fourth section based on the need to address any rival explanations or conflicting data that may have emerged during the course of data collection and analysis. A conclusion of each case is also included. This chapter and its sections follow the format of these groupings across both study areas, listed as:

- 1) Factors of successful UA planning/implementation
  - a. Structure and Organizational Factors
  - b. Stakeholder Involvement
  - c. Key Resource Factors
- 2) Social, economic, and environmental improvements and/or negatives
- 3) Participants’ most successful moments
- 4) Rival explanations addressed
- 5) Conclusion

The analyses in this chapter show that the most crucial factor of UA planning and implementation success (across both study groups) is enthusiastic, dedicated individuals and groups of people. Additionally, the greatest differences between the study areas emerged with regard to economics and financial needs of the organizations. Financial resource factors such as job creation, market viability, and need for a stable banking system are particularly important in the case of Agriburbia but are not considered factors contributing to successful UA in the case of Waterloo where financial factors are primarily relative to start-up funding and a gardener's ability to stretch their 'food dollar'.

In total, two broad categories of factors (organizational and resource) were identified. Organizational success factors were understood in terms of how participants' perceptions and goals shaped their planning methods along a chain of events fueled by key resources. Thus, examples of each group's organization as uncovered from document and interview data are described relative to how they fit into strategy for achieving successful UA implementation. In addition to organizational factors, four subcategories of resource factors were identified (natural, human, financial, and political resources) each with their own unique attributes. A fifth category (technical resources) was found to be crucial to Agriburbia's success, but not prevalent in the Waterloo study.

The way in which these factors contribute to the planning and implementation of UA in each study area is presented in the following sections, beginning with the Waterloo Region study, followed by Agriburbia, and then with a cross-case comparison of the two.

## 4.2: Findings from Waterloo Region

Both the Community Garden Council (CGC) and the Patchwork Community Gardens (PCG) are volunteer-based, grassroots groups and closely linked. Although the PCG was the primary group leading the charge of planning and implementing new community gardens in 2011 and the prime focus of this section, my involvement with the CGC from October 2011 to April 2012 allowed me further opportunities to explore what factors make for successful UA<sup>25</sup> implementation in the Region of Waterloo through participant interviews and other documentation collected for analysis. As the following sections discuss at length, the key planning and implementation success factors were overwhelmingly relative to people (individuals and groups), resource inputs (e.g. land, water, funding) as realized via the support of several organizations and key stakeholders.

Additionally, data analysis revealed a strong connection between multiple stakeholders and their common dedication to social improvements such as community-building, personal well-being and happiness, and assistance for Canadian newcomers. Environmental improvements were also considered important, while economic improvements and/or benefits of UA were not seen as crucial or as important as social improvements. This section concludes with a discussion of how the PCG as well as other participants, stakeholders, and document data suggest that the primary ‘philosophy’ underpinning UA in the Region of Waterloo study largely relates to the *civic agriculture* framework as presented in Chapter 2.

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<sup>25</sup> In the Waterloo case, “UA” is used interchangeably with “community gardening” unless otherwise noted.



#### 4.2.1 Factors of Successful UA Planning and Implementation

As previously mentioned, Region of Waterloo participants overwhelmingly cited individuals and/or groups as being most important when asked what factor most contributed to successful UA planning and implementation. The table below tallies the most commonly cited overall success factor(s) among Waterloo participants. Individuals and Groups are the major categories with characteristics of those categories listed adjacent.

<b>Table 4.1: Factor Most Contributing to Success (Waterloo Region)</b>	
<b>Factor Category</b>	<b>Characteristics (as cited from participants)</b>
Individuals	<ul style="list-style-type: none"><li>• Commitment</li><li>• Passionate, gives fire to keep going</li><li>• Poured more work into the gardens</li><li>• Coordinators, keep it going, enthusiasm</li><li>• Person with an idea and passion to spark it off</li><li>• Charged up with ambition and passion</li><li>• Farming background</li><li>• City councilor</li><li>• Walk through the steps</li></ul>
Groups	<ul style="list-style-type: none"><li>• Went above and beyond, donate time and energy</li><li>• Academics and people in their communities</li><li>• Provide continuity, some infrastructure, some material needs, connections, private or public sector</li><li>• Cooperation of gardeners, chip in the work, make time</li><li>• Strong community, share the workload</li><li>• Interested people</li></ul>

It should also be noted that these key implementing individuals and/or groups were not necessarily trained as expert or ‘master’ gardeners; rather, they had only some novice or hobby gardening experience over a few years (with the exception of one participant who had several years of organic farming experience). This can be found across the broader scope of

community gardening in the Region as well. For instance, a report prepared by a CGC member notes that “most are initiated by individuals or voluntary organizations” and “they value novice gardeners, newcomers to Canada and the community” (Michalenko, 2010:9-10). However, the same report also highlights the diversity of skills and experience that can be found among gardeners in the Region—a characteristic I also observed among the broader group of gardeners with who I was involved throughout the summer of 2011. Additionally, I noted that both PCG sites displayed a diverse and multicultural make-up, with gardeners representing European, Asian, and African heritage<sup>26</sup>. Below are the commonly cited examples of participants’ perceptions of the most important success factors (with references to individuals or groups coded as such in [brackets]):

*P1-PCG: I think the biggest factor or factors that contributed to the success of the gardens was the commitment of people like (Member-A), (P2-PCG) and yourself and those from (P5-CGC’s) [Group] office who went above and beyond to donate time and energy to this initiative, especially (Member-A) [Individual], who poured more work than anyone into these gardens.*

*P2-PCG: I think just the group of organizers at each site. So... I mean yourself included, (Member-A), and (P1-PCG). So... the three of you [Group], and then also (City liaison) in the city, I just met (City liaison) once initially, and (City liaison) [Individual] was so passionate about it, and it just kind of gives you the fire to keep going.*

*P1-UF: Well, I would say that is the people [Group]. What seems to be the motive behind UA is not coming from the municipal level; it’s coming from academics, [Group] from people in their communities [Group]. The general interest for it is ‘on the street’ so to speak. It’s not, I don’t think, something that’s being led by municipalities.*

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<sup>26</sup> This was no coincidence due to the PCG’s mandate which seeks to establish inclusive garden spaces for families and individuals across multiple socio-economic, age, and ethnic demographic categories (hence the “Patchwork” in Patchwork Community Gardens).

P1-CGC: *I think it's the coordinators [Individual]. Like assume you have the basics where it is possible to water stuff, you need everything. But the coordinator [Individual] would be a very important thing to keep it going because there's going to be a lot of missteps in the first couple of years, so you need that enthusiasm.*

P2-CGC: *...And what came from that was a person [Individual] with an idea and a passion to spark it off, had the idea, and a facilitating organization [Group] to provide some continuity, some infrastructure, some material needs, connections, something like that, and it didn't matter whether it was a private or public sector particularly, but as long as there was an institutional back-up [Group] as well as somebody [Individual] just charged up with ambition and the passion for starting something new, and getting on with it. And I think that holds true here as well...*

P3-CGC: *Well, it's a co-operation of the gardeners [Group]. You know. Everybody [Group] has to chip in the work, whether you like it or not, and then you have to make time.*

P4-CGC: *Well, and this would be very often if not always the case, I mean I [Individual] had the organic farming background, so it was just people... [Group]*

P5-CGC: *Well, I think you need to have a really strong community group. [Group] And then what I always say to this group is that I encourage them to invite their local councilor [Individual] to a meeting and to explain to them what it is they're trying to do. And a fact that this group shares the workload helps make it a success because it's far too much work for one person. And then getting support from the surrounding community. [Group]*

With regard to getting new gardens started, one participant reiterated:

P5-CGC: *...And then I'll say, "The one thing you really need is a group of interested people." [Group] So they have to go out there. They have to find those interested people [Group] and then I [Individual] will meet with them and help them walk through some of the steps that they [Group] need to take to get their garden up and running.*

These findings show that the overall factor contributing to successful planning and implementation of UA in the Region study group is two-fold, yet tightly linked: individuals and groups. This relates to notions touched on more broadly in the research literature which analyzes planning success, e.g. where individuals who contribute to success are described as leaders, champions, or 'great-men' (Talen, 1996a). It should also be noted that participants

used descriptions (e.g. passion, ambition, chip in the work, shares the workload, went above and beyond, fire to keep going, interested people) which demonstrate some common attributes of these individuals and groups. In addition, these people come from many walks of life, not least of which are newcomers to the community or immigrants as well as those who may have little or no gardening experience prior to joining or starting community gardens.

Although these findings cannot verify whether or not experience is a key factor in implementing multiple community garden start-ups, this case does suggest that prior farming or gardening experience of the core implementing individual or group is not necessarily a prerequisite for harboring successful UA. Nevertheless, success would not have been achieved without the assistance of groups external to the PCG who did have some prior experience with UA and who were capable of contributing to implementation.

Many other factors were found to contribute to making the PCGs a success and are discussed in the following sections. In order to understand the UA planning and implementation process in the Waterloo study, a discussion of the formation and organizational structure of the PCG is presented, followed by a discussion of other key resource factors contributing to success. Focus is on the PCG group, but participants from within the CGC as well as other document sources are cited in order to understand how the PCG fits in more broadly across other examples of community gardening in the Waterloo Region.

### ***Structure and Organization of the Patchwork Community Gardens***

The PCG are represented by three garden coordinators and a loose affiliation of volunteer members who oversee and maintain three community gardens in the Region of Waterloo. Three gardens in the City of Waterloo were built in the spring and summer of 2011. The PCG came together as a result of outreach to multi-cultural communities which began in 2010 with partnership of the Diggable Communities Collaborative and the Council of Agencies Serving South Asians. An outreach worker was hired to promote gardens to the multicultural communities, and three multicultural workshops were held. As a result, the multicultural garden project formed which helped launch the PCG project.

The PCG group aligns quite closely with Gundelach's (1979:187) definition of *grassroots organizations*: "local political organizations which seek to influence conditions not related to the working situation of the participants and which have the activity of the participants as their primary resource." The PCG focuses on creating inclusive community garden spaces for youth, new immigrants, families, and individuals who seek to grow their own food in the city for social, health, and/or economic benefits. My involvement as a participant with the PCG officially began in March 2011, with some organizational meetings at a member's home. The PCG committee was established in early 2011 around three key individuals with a few other volunteers forming a support group of which I was a part. From there, my responsibilities included garden design and layout, participation in a public meeting to promote awareness of the gardens, garden installation/construction, general maintenance and upkeep, and being a signatory on the PCGs bank account.



*Figure 4.1: Left: Patchwork Community Garden at the EMS building in Waterloo. Right: Patchwork Community Garden at Wilfrid Laurier's Northdale campus in Waterloo. Sources: Google Maps.*

Two PCGs were implemented in May 2011, one at the EMS building at Westmount and Father David Bauer Boulevard in Waterloo, and a second at the Northdale campus (once a primary school, now owned by Wilfrid Laurier University) near Columbia and Hazel streets in Waterloo (Figure 4.1). Both of these community gardens hold 20 garden plots, each 10' by 10' square raised-beds, contained by 2x6x10 lumber edges and filled with a mix of topsoil and compost. A third garden, located on the Ecole L'Harmonie school property in the Vermont Park Neighborhood of Waterloo, was established by the PCG in August of 2011 but is not a focus of this study. It contains a number of 10' by 10' plots in the same manner as the other PCGs. The following figures demonstrate the design, scale, and form of the Northdale and EMS garden sites in more detail.

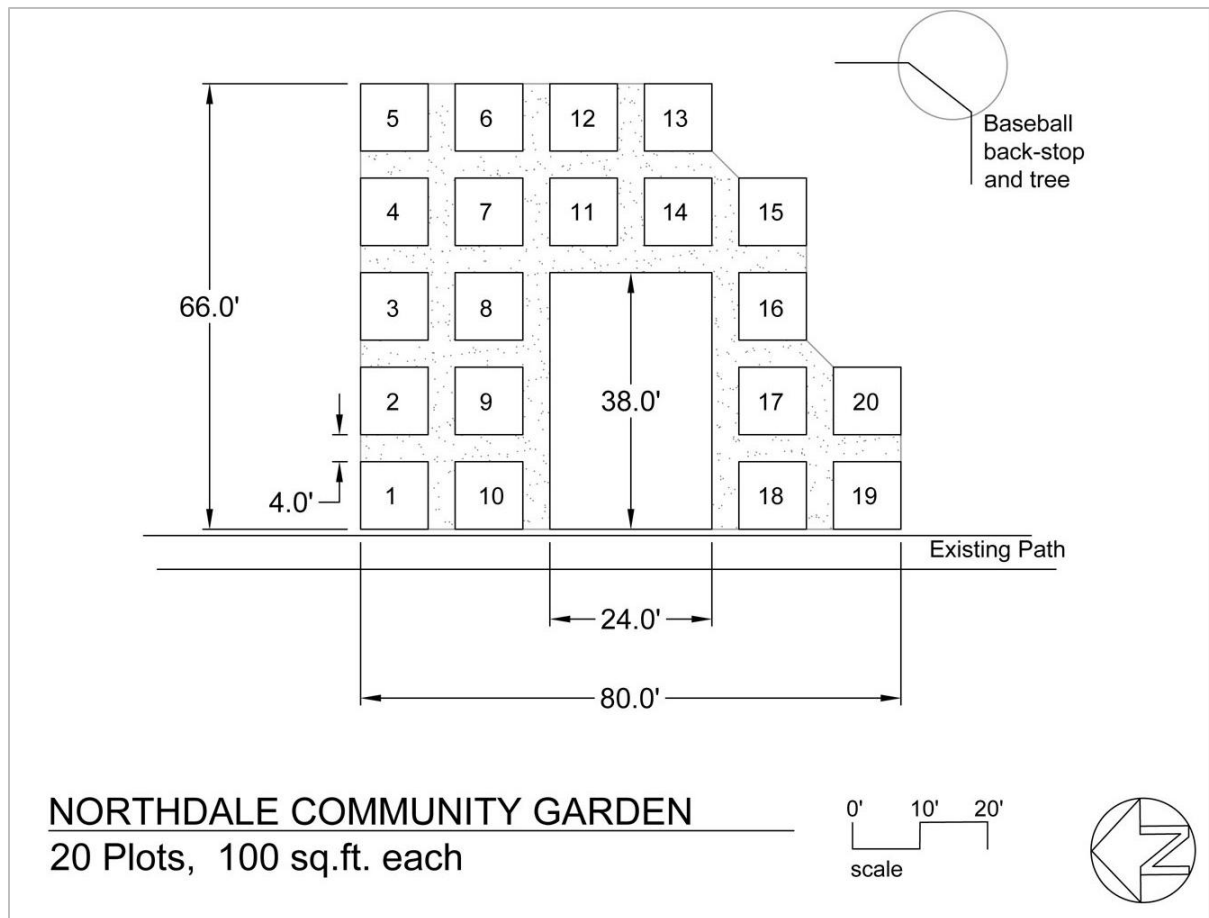


Figure 4.2: Northdale garden site plan (drafted by author)



Figure 4.3: Northdale PCG site, view southeast, May, 2011 (photo by author).





Figure 4.4: Northdale PCG site, August, 2011 (photo by author).

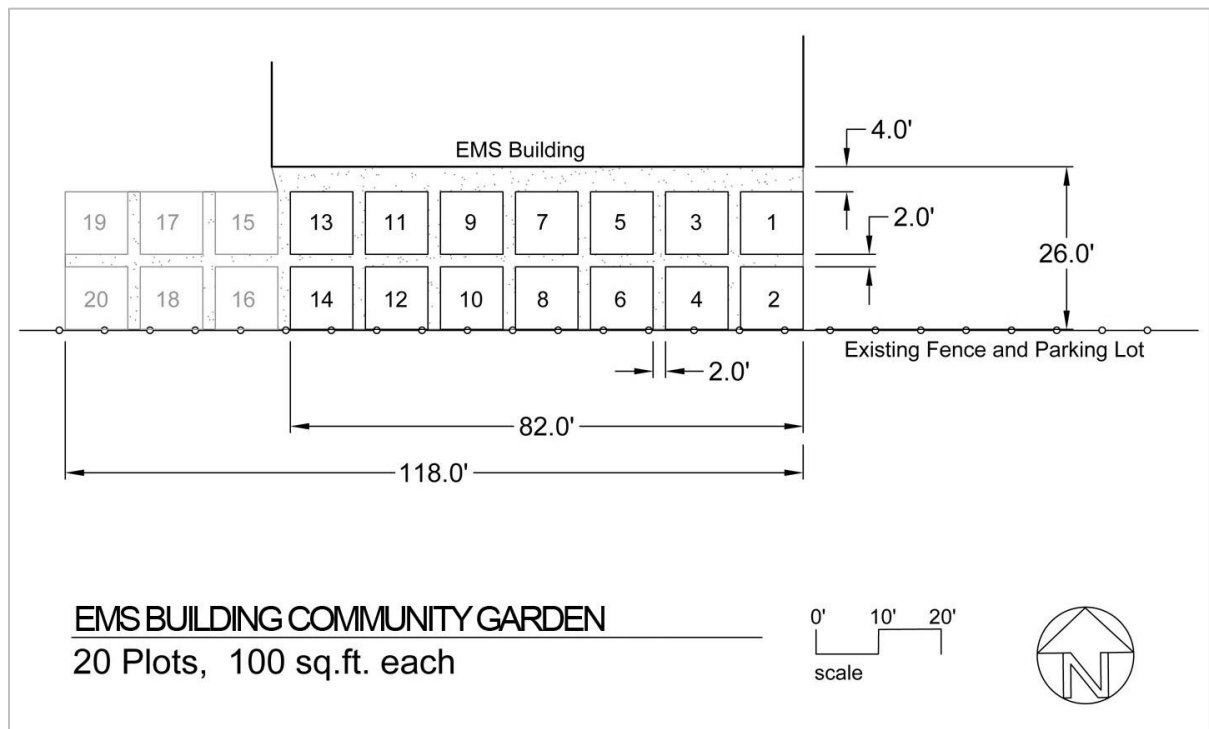


Figure 4.5: EMS garden site plan (drafted by author). Plots 15-20 were installed to the east of plots 1 and 2, and the 2' gap running east-west was omitted, leaving 6' between EMS building and plots for lawn mowing.





*Figure 4.6: EMS garden, view west, July 2011 (photo by author).*

### **PCG Organizational Features**

- Volunteer-based, tied to two key partner groups:
  - ‘The Branches’, a loose, grassroots affiliation of volunteers
  - The African Community Wellness Initiative (ACWI), a charitable and grassroots organization
- Core steering group, typically three coordinators
- Typically season-beginning and season-end meetings of core committee with other meetings as necessary
- At least two outreach events held annually: the Early Buds Spring Event (spring) and the Harvesting Wellness Produce Swap (late summer)

The planning methods of the PCG were quite iterative and cyclical in nature. Once a core committee group was established, the planning methodology of the organization followed an informal strategy of designating roles among group members and identifying action items for each group member to carry out. Initial planning meetings were held at ‘The Branches’ (a PCG coordinator’s home) and included interested volunteers as well as representatives early

on in the planning process from two outside organizations: the K-W Multicultural Centre and Opportunities Waterloo Region.

Meeting minutes or ‘action notes’ of the group in March of 2011 further reveal how the PCG organized around roles and responsibilities designated for each member. Some example responsibilities included the need for resource allocation (finding land, compost, etc.), plotting and design of the garden spaces, administrative support, and designating a treasurer. One individual, a Community Organizer for the African Community Wellness Initiative (ACWI), became the lead coordinator, and the ACWI in partnership and support from the African Canadian Association (ACA) also applied for funding for the PCG since the PCG was (and is) not a charitable organization and therefore had a limited capacity to pursue certain grant applications available at that time.

Additionally, many of the roles and responsibilities of PCG members evolved throughout the initial planning stages and into the initial start-up of the gardens. For instance, the ACWI grew to be recognized as a key contributor to the PCG due to participation of the Community Organizer in a formal capacity (with hours spent on tasks listed and reported back to the ACWI steering committee). The Community Organizer’s time spent working with the PCG was formally recognized throughout the planning and implementation process while the representatives from the K-W Multicultural Centre and Opportunities Waterloo Region gradually became less involved due to their time constraints once the initial planning of the gardens were complete. In this way, it can be understood that the PCG were not only dependent on individual volunteer efforts internal to its group but also on formally recognized support from external organizations.

Themes of community engagement and outreach are other key ingredients to the PCG success, and this has carried through into upcoming year goals for the gardens. For instance, in a recent grant application (Region of Waterloo Community Environmental Fund), the Global Youth Volunteer Network outlined a strategy or ‘work plan’ for achieving the goal of recruiting, maintaining, and creating new gardens via collaboration with the PCG steering group and other volunteers or supporting organizations. The work plan highlights four key areas, namely:

1. Outreach & Communication
  - a. Recruiting gardeners and volunteers
  - b. Event planning
  - c. Maintaining a database of gardeners and volunteers
  - d. Ongoing culturally inclusive awareness-raising on environmentally sustainable agriculture
  - e. Supervise the development of an accessible communication portal (website/blog) and updating information
2. Networking
  - a. Strengthening partnerships with support organizations by sending project updates
  - b. Participating on the Waterloo Region Community Garden Council (CGC) and other relevant UA networks
  - c. Share the strengths of the project with the community
3. Maintenance
  - a. Providing support to volunteers and garden coordinators
  - b. Oversee community garden site maintenance and the distribution and use of tools and resources and the Patchwork sites
  - c. Maintain contacts for our land partnerships and facility supervisors
4. Evaluation
  - a. Develop evaluation tools (surveys, questionnaires, etc.)
  - b. Carry out project evaluation

Outreach, communication, and networking among key individuals, groups, and organizations can be understood as crucial to success. Organizationally, the PCG fits not only with Gundelach’s (1979) definition of a grassroots group, but also falls in line with

broader discussions of what constitutes successful leadership among volunteer-based organizations. Leaders of successful volunteer groups are said to display qualities of ‘transformative leadership,’ or, leaders who are able to recruit committed and dedicated volunteers based on personal qualities rather than through punishment/reward strategies (Canato et al, 1998).

Additionally, other resources such as land and water, start-up funding for purchasing materials, and promotion/outreach to potentially interested gardeners were also very important. The next sections describe these organizations and their involvement as well as other resource factors contributing to the PCG’s success.

### ***Stakeholder Involvement***

Stakeholders in the Waterloo Region—defined as organizations that have an interest or influence on UA development—were identified and discussed as part of the interviews and other data collecting. Participants viewed community groups and/or other volunteer members as the most important stakeholders (as with overall success factors of individuals and groups), with institutions also being very helpful in obtaining environmental resources such as land and water access. Table 4.2 illustrates stakeholder or member roles with the PCG specifically.

<b>Table 4.2: Stakeholders/members in the PCG</b>	
<b>Stakeholder Categories</b>	<b>Example</b>
Key individuals	<ul style="list-style-type: none"> <li>• Members and volunteers within the PCG</li> <li>• Key members of the following organizations (below)</li> </ul>
Community groups, charities, and grassroots organizations	<ul style="list-style-type: none"> <li>• ‘The Branches’</li> <li>• The African Community Wellness Initiative (ACWI) and the African Canadian Association (ACA)</li> <li>• Community Garden Council (CGC)</li> <li>• K-W Multicultural Centre</li> <li>• Opportunities Waterloo Region</li> <li>• K-W Urban Harvester</li> </ul>
Funding institutions	<ul style="list-style-type: none"> <li>• TD Bank (Friends of the Environment Fund)</li> </ul>
Other Institutions	<ul style="list-style-type: none"> <li>• Region of Waterloo Public Health</li> <li>• Wilfrid Laurier University</li> </ul>
Municipal government	<ul style="list-style-type: none"> <li>• Region and City of Waterloo</li> </ul>

Overall, key stakeholders identified across the Waterloo study included many institutions, non-profit/charitable organizations, and grassroots volunteer groups. CGC participant comments reiterate these findings, for example:

*P2-CGC: I think that those are a varied lot. ...A surprising number of them were Canadian newcomers, and many were apartment dwellers. ...And I think the public health office, the regional public health office has been quite important there. There’s also horticultural societies, which have the master gardeners – would provide some instructional things too. So I think they’re showing up from a number of different directions.*

*P5-CGC: Well, there are various levels in which to answer this question. So at the grassroots level I would say the faith based groups and some of the community centers. At the sponsorship level I would say it’s Opportunities Waterloo Region. At the municipal level there’s one municipality that has a fantastic community garden policy and funding source. And then the Community Garden Council has been extremely helpful in promoting and sustaining community gardens. The council members are mostly volunteers who have donated their time and energy into this task. Just to note they are not an advisory council to a governmental body, but they are dedicated grassroots group.*

Two PCG participants who were interviewed felt there were key individuals and groups (again, as with the overall success factors) who were the most crucial:

*P1-PCG: If I was going to be really honest, I would say, that (Member-A) and I... although we represent organizations, they're very much grassroots. We're not a formal organization. If it had not been for (Member-A) in particular... There's no question (Member-A) was the leader. But I played a role with (Member-A). But there is no one organization that made it happen. There were people in the City who wanted it, or people in the Region who think it's a good thing, but they wouldn't have made it happen. So I think it's important to note that it was individuals within the community and grassroots organizations within the community that were the primary stakeholders that really drove this, I think.*

*P2-PCG: From my side it would definitely have been (P1-PCG), because there was a couple of times when (P1-PCG) said, you know, I need to get this compost out. ...So we'd call (P1-PCG) and (P1-PCG) would say, "oh I got a few people, don't worry about it, or so-and-so just called me and they're looking for something to do this afternoon." So (P1-PCG) is very well plugged in, and I think that's definitely what kept our site going.*

It should be noted that the complexity and magnitude of stakeholder involvement cannot be completely covered in this study. Nevertheless, it is important to describe the characteristics of certain key stakeholders who contributed to the PCG project during the planning and implementation phases since they are so closely tied to the work. Indeed, the PCG (as well as several other community gardens across the Region) would not exist without the help of these key organizations and a few of the individuals within them. Many of the stakeholders or volunteer groups involved in community gardening throughout the Region carry the same mandates, goals, or visions, which lends these stakeholders a strong fundamental connection to the same goals as the PCG. The next few subsections describe these stakeholders in more

detail and how they have contributed to UA development both within the PCG and across the Region as a whole.

### **The Community Garden Council of Waterloo Region**

The Community Garden Council (CGC) is a volunteer-based, grassroots organization of people actively engaged in the community garden network within the Waterloo Region. It was established in 2005 and is comprised of no more than 12 members annually with meetings open to anyone interested in community gardening. The mission of the CGC is “to promote and assist with the sustainability of community gardens throughout Waterloo Region” (CGC, 2011). At time of this writing, there are 43 community gardens in the Region of Waterloo. The CGC meets monthly (except July). The CGC mandate includes:

- Public promotion and communications (including multi-media campaigns)
- Promotion of partnerships with stakeholders
- Active participation in community events
- Research, education, and advocacy support
- Coordination of resource support, where available
- Actively seeking funding
- Promotion of environmentally sound practices

One individual within the CGC was cited as being particularly helpful in advocating for the PCG: “...the Community garden Council for sure... (P5-CGC) was the central person...” (P1-PCG). The CGC is one part of the Diggable Communities Collaborative (DCC) which also includes Opportunities Waterloo Region and Region of Waterloo Public Health. For a time, the Council of Agencies Serving South Asians was a part of the DCC which led to the launch of the multicultural gardens outreach and what ultimately brought together the core members of the PCG. The DCC has been defined as an initiative of the

organizations mentioned above with the aim of promoting and starting new community gardens in the Region of Waterloo (DCC, 2008).

### **Opportunities Waterloo Region and K-W Multicultural Centre**

During the initial planning for the PCG, representatives from Opportunities Waterloo Region and the K-W Multicultural Centre were involved and assisted in outreach to communities with which they were connected, namely, new Canadians and especially members of the Asian-Canadian community of Kitchener and Waterloo. Opportunities Waterloo Region has “a vision of a caring community with social and economic well-being for all”<sup>27</sup> where:

- people care about each other;
- children are cherished;
- diversity is valued;
- food, housing and health care are secure and affordable;
- employment is meaningful and adequately compensated;
- education and training are available lifelong;
- opportunities for participation in community life are accessible and abundant.

Along similar lines, the K-W Multicultural Centre “exists for the purpose of fostering the diversity which exists in this community and of facilitating the full participation of all residents in the life of the community.”<sup>28</sup> Their goals include:

- Celebrate and strengthen multiculturalism
- Promote racial harmony
- Complement services of other agencies
- Meet specific needs as identified by the local ethnic population
- Assist all new Canadians, providing a place to express concerns, feel welcome and understood
- Promote, advance, preserve and develop inherited culture and arts

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<sup>27</sup> <http://www.owr.ca/about-us/missionvision/>

<sup>28</sup> <http://www.kwmc.on.ca/html/who.html>



- Act as a resource to the community at large, educating and informing the community about living in a multicultural society

Support provided by these organizations and their representatives included preparation and participation in a community outreach meeting (the Early Buds Spring Event in April, 2011), language translation, photo-copying of fliers, and providing meeting space. As one PCG participant stated, "...they were very supportive, so they provided some resources, and very helpful in promoting... so a supportive and promoting role I would say" (P1-PCG). Representatives from the K-W Multicultural Centre and Opportunities Waterloo Region had time and resources to contribute at the beginning phases of PCG planning where their particular expertise and roles were strong and most useful.

### **Region of Waterloo Public Health**

On yet another level, the Region of Waterloo Public Health department supports a network "composed of garden facilitators, gardeners, and representatives from community agencies that promote food security."<sup>29</sup> From the same source:

The purpose of the Network is to promote and maintain local community gardens. Activities are focused on public education, building people's gardening skills, linking resources and people to community gardens and information sharing among its members. Free gardening workshops are offered regularly to the members as part of a skills development process. Workshops are open to the public.

Additionally, the CGC has maintained one member from the Region of Waterloo Public Health department as a pay-person on staff, contributing to approximately two work hours per month for CGC meetings, plus other time or volunteer effort during outreach programs or events.

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<sup>29</sup> <http://chd.region.waterloo.on.ca/en/partnersprofessionals/communitygardens.asp>

## The City and Region of Waterloo

The gardens in this study were constructed in the City of Waterloo, and one specifically on City owned land (the EMS building site). Both the City and Region of Waterloo have policies for encouraging and supporting community gardens. For instance, the City of Waterloo Official Plan (2012, draft<sup>30</sup>) demonstrates this commitment:

### 8.7.4 Community Gardens

- (1) The City recognizes community gardens as valuable community resources that provide open space and a local food source, offer recreational and educational opportunities, and build social connections.
- (2) The City will identify land use designations appropriate for community gardens, with consideration being given to compatibility, prior land use and lot area.
- (3) The City will support community gardens through initiatives which may include:
  - (a) promoting the awareness of community gardening;
  - (b) where appropriate, offering City-owned lands as new community garden sites, such as undeveloped parcels and closed road right of ways; and
  - (c) collaboration with the Region.
- (4) The City will encourage backyard, roof top, and workplace gardening, as well as edible landscaping and fruit-bearing trees to complement community gardens.

Similarly, the Region of Waterloo Official Plan (2011 draft) includes language for encouraging and supporting a wider range of agricultural uses in and around cities as part of developing a regional food system:

3.F.1 The Region will support the development of a strong regional food system through the policies in this Plan that:

- (a) establish a Countryside Line to protect the countryside for long-term agricultural use;
- (b) permit a full range of agricultural uses, farm-related uses and secondary uses to support the economic viability of local farms;

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<sup>30</sup> [http://www.city.waterloo.on.ca/Portals/57ad7180-c5e7-49f5-b282-c6475cdb7ee7/DS\\_COMMUNITYPOLICY\\_documents/FinalOPJan25.pdf](http://www.city.waterloo.on.ca/Portals/57ad7180-c5e7-49f5-b282-c6475cdb7ee7/DS_COMMUNITYPOLICY_documents/FinalOPJan25.pdf)

- (c) provide for a mix of land uses, including food destinations, within close proximity of each other to facilitate residents' access to locally grown and other healthy food products; and
- (d) provide a range of human services including affordable housing, subsidized daycare, employment and income supports that seek to ensure all residents have adequate incomes to be able to afford to buy locally grown and other healthy food products.

3.F.2 Area Municipalities will establish policies in their official plans to permit temporary farmers' markets, wherever appropriate, in existing and newly planned neighborhoods, particularly in areas where access to locally grown food and other healthy food products may currently be limited.

3.F.3 Area Municipalities will establish policies in their official plans that encourage community gardens and rooftop gardens.

3.F.4 The Region will support community gardens, wherever feasible, by granting access to Regional lands, and by providing rain barrels, composting bins, compost, wood mulch or other forms of in-kind support.

3.F.5 The Region will collaborate with stakeholders to continue to implement initiatives supporting the development of a strong regional food system.

3.F.6 The Region supports food system planning as a means of improving the regional food system.

The degree to which these municipalities have enabled or inhibited UA in the Region can be further understood in context of this study's participant interviews. For instance, it was noted that although City and/or Regional involvement was part of the success, in one PCG garden in particular there were "people in the City who wanted it, or people in the Region who wanted it... but they wouldn't have made it happen" (P1-PCG). Also, one participant commented how general interest in UA was "'on the street' so to speak" and not "something that's being led by municipalities" (P1-UF).

It was also noted that municipal entities (cities, townships, and/or the Region), although mentioned as a stakeholder, were not mentioned as the most helpful or enabling and

could be considered simultaneously enabling and disabling in new UA development in the Waterloo Region. As discussed, some cities in the Region seek to support UA by offering start-up grants for community gardens as well as having general policies for encouraging them. However, when asked to what degree municipalities have hindered UA in the Region, responses were more illustrative as participants commented on how certain policies, procedures, and bylaws have been challenging obstacles:

*P1-CGC: The city often sets up bylaws that make it difficult for city gardens. So a recent example would be we had some extra money, and we had some students at a high school that built some signs for community gardens, and so they were really nice signs covered in Plexiglas, but there were certain bylaws in certain cities that prevented us from installing them on city land for the garden.*

*P2-CGC: I think the planners, the municipal planners, are very used to operating within their offices, and they're professionals. They take pride in their work, and I think there are some feelings about infringement on their turf if people are trying to give them advice. But I don't know whether it's the academic training of planners, whether the education style is too conventional, and there's not enough emphasis on the sort of transformational potential of planning.*

*I think before you got on the Community Garden Council there was this weird thing about signs...*

*P5-CGC: So we had the money donated from Together-4-Health and we had Elmira District High School students make the signs and all we needed was the city approval to put the signs in place. One municipality, because of its zoning and signage by-laws, didn't get any signs. Whereas another municipality, they said "Oh, sure. It's a free sign and the gardens will benefit. Let's make it happen." And yet another one who said, "Well, we do have a communications look that we have to incorporate on any of our (signs)... We can sort of bring it in under the cloak that it is a city signage but then it has to have the city look." So then all of the signs, just due to funds, all had the city look whether they were in that municipality or not.*

Other municipal processes can be difficult to work through. Participants from the PCGs also cited their experience navigating City regulations before and during garden installation:

*P1-PCG: Following the City and Region regulations, there were quite a few things we had to pay attention to. ...we weren't allowed to put a shovel in the ground on City*

*property. So we had to get around that. We had to make sure there was enough room between the beds and building so that the City lawn mowers could fit through. There were some issues around the use of City water, getting permission to use City water.*

*But what we were allowed to do, what the City would do, what the City wouldn't do... all of those are fairly... they're hurdles. You just have to work with those regulations. And quite often, they were a pain in the neck. And I found some people quite flexible in the application of those rules, and some people not as flexible.*

*P2-PCG: I just realized how much work they (the City) had on their end that had nothing to do with building a garden, in the physical sense. So I think they... you know, they didn't do any building. (P1-PCG) put the 2x4s together, got all the materials, for all the gardens, so they didn't really do those kind of things. But they're more sort of... keeping us in check I guess.*

Additionally, the role of City staff throughout the process was discussed:

*P1-PCG: ...So we did take some negative critique, who just didn't want us to be in their way, or who saw the whole thing as an irritation. And I do think there were some departments... I don't know who some of those people were. Some of those people were the ones [City liaison] had to answer to, and [City liaison] would get permission for this or that. ...[City liaison] was actively supportive, but also hesitant to cross some of the people to whom [he/she] was accountable.*

In another example, one participant cited difficulty in working through City processes:

*P1-UF: In our situation it's the... I guess it's the zoning of our property. ...And they (the city) have said no to a bakery which would be changing the use, not in a formal process. They just gave me reason to believe that an application for re-zoning wouldn't be successful.*

*...but generally it's a perception that the neighbors would be against it, which is the model of civic government: to avoid disputes or avoid conflicts and govern.*

With regard to a particular city council meeting agenda—to limit new community gardens to a minimum distance of 100 meters from any residential lot—a CGC member recounts an experience:

*P2-CGC: I said, "Listen, your biggest fault is that they should be right in with the neighborhoods, and having these lovely gardens there will add something to the neighborhood, and it will be extra eyes for providing safety, and so on." And there's one progressive councilor from Cambridge, but she made them answer the question, "Why do you want them 100 meters away?" And they finally said, "Well there's –*

*‘cause they’re often objections from people about new things in their communities, and we thought if we kept them further away, then there’d be no reason for them to object.” Yeah. Oh, and one of the community gardens was actually in an area that was zoned industrial, and that meant if a sign was to be put up, there would have to be a permit charge of 200 dollars or something...*

In another example, NIMBYism and municipal involvement is highlighted:

*P5-CGC: There actually was a NIMBY response to a garden that wanted to go in in one of the city parks. One person shut that whole process down. Because the city listens to one person, one person’s objection over 15 to 20 people promoting it. So one person holds a lot of power.*

Additionally, during one recent CGC meeting, a community member in attendance expressed some concern about how garden grants were awarded through the City of Kitchener. Kitchener currently offers two types of grants from the same pool of funds: one for food-producing gardens and one for neighborhood beautification gardens. Both types of gardens would be maintained members of the community and/or by residents of the neighborhoods they serve, with the latter being only for ornamental purposes (no food production due to concern over salt or other pollutant contamination near the street) and primarily within cul-de-sac ‘bulbs’. However, as one member of the community expressed, the degree of transparency, accountability, and the rationale for who receives the grants is not fully known. Currently only two city staff are responsible for reviewing applications and awarding grants at their own discretion.

Despite the bureaucratic elements of municipal involvement, municipalities have the opportunity to provide—at least potentially—nearly all the resources needed to not only start-up but also help maintain UA projects across the Region of Waterloo. One example would be the Kitchener Allotment Gardens, one of the oldest food-producing gardens in the

Region, established in the 1970s. The City provides not only the basic resources needed for gardening (land, compost, and water) but also allows the gardeners to sell their produce if they choose, whereas nearly every community garden in the Region is defined as and constrained to non-profit activities only. Originally located in Williamsburg Cemetery, it was relocated last year. Some key facts of the allotments<sup>31</sup>:

- Sponsored by: The City of Kitchener
- Garden location: 1664 Huron Road next to Fire Station
- No. of Plots: 196
- Plot size: 20' x 20'; maximum 2 plots per family.
- Cost per season: \$28.65 (including GST)
- Services provided: Land, tilling, fertilizing with compost, and water access
- Open to: Residents of the City of Kitchener

Additionally, it should be noted that the PCG's EMS building garden site was on City of Waterloo land where water was also provided. The City also provided advocacy and support in the form of a ribbon-cutting event, which included members of the Asian-Canadian community performing a ceremonial dance, as well as a brief talk by Mayor Brenda Halloran. The PCG at the EMS building site was the first official community garden on city land in the City of Waterloo.

In sum, stakeholder involvement in the PCG case—as well as more typically across community gardening in the Region as a whole—is complex and multifarious. All stakeholders identified share similar mandates, goals, or visions along themes of community building and improvement as well as health and well-being, which in some cases includes goals of promoting healthy eating and exercise that come from community gardening

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<sup>31</sup> <http://www.together4health.ca/workgroups/community-gardens-waterloo-region/community-garden-list>

activities. All stakeholders contribute to providing several resources for making PCG and other gardens successful, as is discussed in the next section.

### ***Key Resource Factors***

For the Patchwork Community Gardens (PCG), most all of the resources required for successful implementation came from external sources, with the exception being certain dedicated and enthusiastic individuals (internal human resources) provided by the core steering committee and volunteers within the PCG. Four categories of resources were identified and are listed in Table 4.3 below. Note that the ‘human resources’ category overlaps with the discussion earlier in this section regarding the overall success factor (key individuals/groups) which was essential in making the PCGs successful. Thus, human resources—the most crucial resource factor to successful UA planning and implementation in the Waterloo study—are both internal to the organization as well as coming from external sources and across multiple stakeholder groups. This table, along with the previous discussion of stakeholder involvement, demonstrates the tight link between resources and the stakeholders which provide them.

<b>Table 4.3: Key Resource Factors for the Patchwork Community Gardens</b>		
<b>Factor category</b>	<b>Characteristic</b>	<b>Example stakeholder contribution</b>
<u>Human Resources:</u>		
Individuals and Groups	Enthusiastic, dedicated, passionate	P2-PCG: “(City liaison) was so passionate about it, and it just kind of gives you the fire to keep going.”
	Commitment, go “above and beyond”	P1-PCG: “...the biggest factor or factors that contributed to the success of the gardens was the commitment of people... who went above and beyond...”
<u>Financial Resources:</u>		



Start-up funding	Materials purchases for starting the gardens	P2-PCG: "...our funding came from the TD Friends of the Environment. And that was hugely helpful as well."
On-going funding	Used for long-term needs of the gardens	Annual use fee for each garden plot
<u>Natural Resources:</u>		
Land and water	Preferably secure tenure and close to neighborhoods they serve	One garden on City of Waterloo land and two on School lands
<u>Political Resources:</u>		
Advocacy	Organizations and/or politicians promote gardens	K-W Multicultural Centre and Opportunities Waterloo Region help host the "Early Buds Spring Event" which recruits several interested gardeners
Policies and/or bylaws	Municipal policies to aid citizens in creating community gardens	Region of Waterloo Official Plan to "encourage and support" community gardens across the Region

*Table 4.3 (continued)*

As demonstrated, many stakeholders contributed to providing these resources, but the amalgamation of resources for the purpose of implementing the gardens was largely the responsibility of the PCG committee and volunteers, particularly with regard to use of financial resources and the 'hands-on' construction of the gardens. Once the core PCG steering committee had been formed, and key stakeholder groups identified, the next task was to allocate and assess the available resources. The ability of the PCG coordinators to network across multiple stakeholders and/or volunteers in order to obtain and utilize these resources was crucial to success. For instance, land and water was provided by the City of Waterloo for one garden and Wilfrid Laurier for another, but the core steering committee as well as several garden volunteers constructed the raised planting beds and moved dirt and compost. A few participants also volunteered use of their vehicles for hauling materials as well. Financial resources were used to make material purchases such as tools, water barrels, topsoil and compost, and garden signs, although some PCG members brought tools of their

own during construction as well as on-going through the season for gardening. Purchases made by the PCG were kept in a spreadsheet in order to keep track of spending and for reporting back to the funding institution.

Overall, organizational structure of the PCG was comprised of multiple stakeholders who all contributed some amount of resources to the project. So many of the stakeholders shared common mandates, visions, or goals which contributed to success for the many people and organizations involved in the PCG implementation which was also reflected more broadly across the Region from CGC participant comments. The next section describes the outcomes of the PCG project and other community gardening projects across the Region as realized through participants' understanding of socio-economic and environmental improvements and their own perceptions of their greatest, successful moments.

#### **4.2.2: Social, Economic, and Environmental Improvements and/or Negatives**

Of all the dimensions discussed (social, economic, and environmental), comments of social improvement success were the most recognized and tangible among participants. Improvements in terms of economics were the least known or commented on, while environmental improvements were more known than economic improvements. Other document sources also demonstrate the improvements resulting from a community building focus in the Region (Michalenko, 2010; Wormsbecker, 2008; Dow, 2006), such as crime reduction or improved health and well-being among garden participants. Although specific economic improvements have not been comprehensively measured in the Region, there remains at least a potential for economic improvement for individual gardeners within garden plots. Further, certain social dimension factors such as community-building or personal well-

being contribute greatly to understanding how participants value community gardening and perceive success. The table below highlights the common factors related to improvement success across all three dimensions:

<b>Table 4.4: Factors of social, economic, and environmental improvements in Waterloo Region</b>	
<b>Dimension</b>	<b>Factors of improvement</b>
Social	<ul style="list-style-type: none"> <li>• Quality of life: <ul style="list-style-type: none"> <li>○ Community-building (meeting people, especially for ‘newcomers’)</li> <li>○ Personal well-being (health, happiness, stress relief)</li> <li>○ Decreased crime</li> </ul> </li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Quality food for less cost (stretching the ‘food dollar’)</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Ecology: <ul style="list-style-type: none"> <li>○ Local food (decreased food miles)</li> <li>○ No use of chemicals</li> <li>○ Less use of water</li> <li>○ Less use of fossil fuels</li> <li>○ Composting</li> <li>○ Urban biodiversity</li> </ul> </li> <li>• Aesthetics: <ul style="list-style-type: none"> <li>○ Garden space, not maintenance of lawn</li> <li>○ Beautification</li> </ul> </li> </ul>

The next sub-sections describe in more detail participant comments regarding these social, economic, and environmental improvements.

### ***Factors of Successful Social Improvement***

From the perspective of the social dimension, participants’ most prevalent comments regarding UA improvement included having a place to meet and the advantage of community-building. New Canadian involvement in Waterloo Region was often cited, with opportunities for newcomers to connect and strengthen community and friendships perceived as being of particular importance for those new to the Region.

P1-CGC: *So a community garden will – like if you imagine living in an apartment, I don't know if you ever did, you tend to be isolated. And with a garden, it's not always with everybody there, but I think having a place to go, and usually there's benches you can sit down and bring your kids. I think it does help you get out of your shell if you're brand new to the area. So social values could be grown there.*

P2-CGC: *I think they sometimes do become a neighborhood focus, and so there's some community building there. They do provide a chance for some connections and friendships to develop. For the newcomers, it gives them a chance to feel some security and strength, I think, but there are others who faces some of the same challenges.*

*... the gardeners there (Kitchener allotments) a lot of them were originally from elsewhere, where people did grow a certain amount of their own food. So one of them was from Jamaica and he had 1200 square feet, three plots....*

P3-CGC: *Well, it starts gradually, for instance there is a social gathering during Thanksgiving time, we have a pot luck, which gets all gardeners together. It's a very nice social evening. Everybody is looking towards this event. Our community garden is kind of a sanctuary for city gardeners to meet and enjoy a coffee, chat about our garden, sit on the bench enjoy the nature life takes its course and so on, not everybody does that.*

P2-PCG: *I think it would be so great to have a nice mix, right? Newcomers and natives, working together. Just because newcomers, when they come out here and they're alone, they have no connections. And it's crazy, it's just crazy, their lives, when they arrive, and it's just like "here you go, welcome to Canada." So I thought this would be such a great way to kind of integrate, or just to make those connections so that if something were to happen, they would know one person they could call, or one person they could email.*

Other social improvement successes mentioned were conflict resolution, decreased crime and vandalism, increased sociability through visibility, and increased personal well-being, health, and happiness:

P4-CGC: *It can contribute to making a neighborhood safer. It can really help improve issues with vandalism. It can improve people's lives socially. If people are successful at working together, it just really exponentially increases the value of the garden.*

P5-CGC: *...I was just sharing the story of the Christopher Champlain Community Garden. ...So the Christopher Champlain residents felt very judged by their neighbors. ...they were successful in mobilizing Home Depot's "Team Depot" and*

*they put the garden in. And neighbors that were previously yelling at their children and calling them names were actually mentoring the same children in the garden. It's an activity that people from all social levels can participate in. So, really it broke down a lot of the barriers that way.*

*There was actually a story on the Victoria Hills garden when it first started as well. ...initially when the garden first started they noticed an increase in the crime calls because people were actually noticing what was going on in their neighborhood and were taking an interest, so they had an increase, and then after a short period of time thereafter, their crime calls were reduced dramatically to about 75%.*

*P1-PCG: Every time I was at that garden, people stopped. Passers-by stopped and wanted to ask about it. So it really piqued people's interest, and so many people said "I'd love to have a spot here" or something like that. ... It was socially beneficial just simply because it was quite visible, so it increased the visibility of community gardening in our city.*

*...The individual's producing their own food, getting their hands dirty, working alongside their child or their spouse or partner or friend, and making something out of the ground, is hugely socially beneficial. I think it increases a person's well-being, happiness, and joy. To me, that's important.*

*P2-CGC: I think there's the big educational component to it. It gets people into a new realm of experience, and that was healthy. It's exercise, and it's recreational too. It's very soothing. I guess that's something I've found from it is teaching is a stress, and coming home and preparing a meal, and going out in the garden were nice ways of doing something completely different, but still part of your daily life.*

*P1-UF: I think it's a community development tool, a community engagement tool, especially if you can get people gardening in visible places. Because I think one of its biggest contributions is not the money saved, the produce can be part of it; it's the expression of care. ...And I think in many ways that's one of the biggest things that UA affords the city is that connectivity between people.*

The many contributions to society that result from community gardening have been studied in the Waterloo Region before. Many similar themes emerged, such as increased perception of neighborhood safety, contributions to personal well-being and happiness, and stress relief (Dow, 2006). Additionally, another survey conducted in the Region (Wormsbecker, 2008) has demonstrated that individuals' reason for involvement in community gardening revolves around community related aspects such as the diversity of gardeners, inclusion of children,

and outreach into the larger community. Overall, improved quality of life can be seen as the major theme determining improvements resulting from successful UA in the Region. These social improvements made in the community and the benefits to gardeners—especially newcomers (new Canadians and people generally new to the area)—are among the most poignant demonstrations of success, and indeed reflect the very nature of UA in its origins as community gardening (see also Chapter 1) where nearly all North American community gardens over the past century have served several purposes including community engagement (Lawson, 2005).

### ***Factors of Successful Economic Improvement***

Economic success factors mentioned among the participants in the Region included improved quality of food and decreased cost of food when grown in a garden compared to purchasing at a store:

*P1-CGC: So economic, I think the main area would be just the cost of food and the quality of food that you're getting at the low price. So usually the costs that you have are the plot, which is usually \$20 for a plot for the year. Cost of seeds. I don't know how much water costs, but there's some sort of contribution for that. And then it's just your sweat-equity after that. So I think having the quality food for those prices, hopefully it works out to be a good thing. Definitely for the quality, I think a lot cheaper.*

*P3-CGC: Economically, well, I don't buy much at the store, vegetables and ... at the store. During the summer, I don't buy flowers I grow my own. And, some people, they really count on the community garden, with a straight income.*

*P4-CGC: I'm not quite sure what you mean, other than decreasing your grocery bill. Well, like not needing to pay for transportation to go to some retail place to buy food, because typically people live close by so they can walk or ride over there.*

*P5-CGC: ...And in actuality, in the last couple of years I have seen the interest in community garden going from a leisure activity to now getting calls from people who are desperate and wanting to stretch their food dollar. So they're not just gardening*

*because it's a recreational activity for them. They're gardening now because they want to provide food for their family and save a few extra dollars that would necessarily go to food and you know, divert that money to other needs that they have.*

*There's never really been a study in our gardens to see how much it would help the economic... But it'd be very interesting to study that.*

*P2-PCG: I think that was a big thing about giving away a lot of those plots too, is that produce is expensive. And it's expensive in the inner city. So to be able to grow your own from seedlings, it can really I think make a big difference in a family, and just giving them... or allowing them to have healthy options. So I think that's one of the big things.*

One participant commented how context (and/or scale) of UA economics need to be addressed in order to achieve needs and basic income levels more effectively:

*P2-CGC: Economically, well you get some food out of it and one of our Community Garden Council meetings... (a CGC member) had a call from someone who was really poor and they're going to send that person to do volunteer work ten hours a week at (a) community CSA, and so that – I made a calculation that... For 120 hours of work they would get 400 dollars' worth of food. And so that says – you can't – economically I think it has to be merged and put in a context of a larger picture, and there are two essential things there is make the minimum wage and reflect needs more concretely. It's fallen because of inflation.*

Additionally, one participant (a coordinator responsible for accessing materials and building a garden) was unsure if a typical community gardener truly experiences any financial benefit:

*P1-PCG: Well, I don't know if a 10'x10' garden is financially valuable to a gardener. If you have to travel there, especially if you have to travel by bus or by car, it costs money every time. I think that the cost of seeds and transportation are pretty hard to get back in a 10'x10' plot. To be honest I'm not sure – especially in the first year – that it is financially beneficial for anyone. I don't have the scientific evidence on that, but I doubt it's financially beneficial.*

A CGC participant, although not sure community gardens could generate a lot of income, felt that the economic dimension could also contribute to the social benefits in a person's life:

*P5-CGC: Will there be a lot of income generation from a community garden? Likely not, because the plots are very small, but just the fact that... sometimes people just need an incentive in their life. So if they actually did work in a community garden and built up their self-confidence and their self-efficacy skills, they feel good about*

*what they're doing, they're able to grow, they're able to sell a few things, it really builds up their self-confidence in other areas in life, I think, and the skills that they learn at that level can be transferred over.*

Economic improvements resulting from UA in the Waterloo study presented here have not been conclusively determined, other than at the individual level where a gardener may experience some temporary offset to purchases of fruits or vegetables during the peak growing season. However, this study was limited to researching community gardening in particular, and with the exception of the Kitchener allotment garden (which does allow sale of produce), nearly all community gardens are specifically non-profit. A recent vote among the CGC in October of 2011 revealed that most CGC members are in favor of keeping with a definition of community gardening as primarily non-profit, with sales of produce for the purpose of garden fundraising being one exception. Furthermore, other research in the Region (Wormsbecker, 2008) suggests that gardeners across the Region have expressed some interest in selling at local markets, but also felt that established community gardens need little or no outside financial assistance, and that community gardens work best when kept at the grassroots operational level. A more statistically generalizable study regarding how community gardens contribute to economic improvements in urban settings or benefits gardeners has not been conducted to-date in the Region of Waterloo. Nevertheless, the potential remains, and some gardeners have expressed or experienced offsets to their vegetable purchases during the growing season.<sup>32</sup>

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<sup>32</sup> I personally noticed a need to purchase less leafy greens at grocery stores during June, July, and September as a result of keeping my own community garden plot in the Region during 2011. Although I did not measure precisely how many pounds of greens or other vegetables I grew, I estimate it could not have been more than tens of dollars of savings during the height of the growing season in my case (10x10 garden plot, with two to five weekly visits to the garden).



## ***Factors of Successful Environmental Improvement***

Perceptions of environmental improvements cited by participants fell largely within themes of ecology (e.g. organic/ healthy food production, having a place to compost, local food and decreased 'food miles', water conservation, urban biodiversity), and aesthetics (e.g. having land as garden space instead of lawn space, making the urban environment prettier):

*P1-PCG: I do think that aesthetically the environment was enhanced by having the garden there. That's important. But so, under the environment, we contributed to the food grid. It's just a little bit less demand on the food systems by producing our own. So I see that as being beneficial to the environment. I think that plants and the abundance of plants, when you're cultivating lots of plants, that feeds into environmental systems, I don't know how exactly. I'm not an expert on that, I just think that when I see all green, and compare it to the grass that would have been there, to me that's better for the environment in some way.*

*P1-UF: Organic agriculture and good farming practices can be less harmful than most other land uses. I suppose in an urban context, the need or desire to grow food can be a motive force to clean up brownfields or improve the health of degraded soils to enable food production.*

*P3-CGC: Well, environmental benefit, we're recycling, like, I'm doing composting. We have composters there, so whatever scrap, like, potato peel, carrots, old veggie or old fruits, I'll bring them and put them in the composter.*

*P4-CGC: Well, that you're not relying on food being transported potentially huge distances. There's a health aspect, but that's kind of getting away from... the fresher the food, the more nutritious it is. Yeah, so, typically people aren't using pesticides. That's not always the case. Typically people aren't using fertilizers. I've never seen that... I've seen the pesticides, but I've never seen chemical fertilizers, but that may happen. So those are going to be environmental benefits. Often there's a limit to... several of them aren't directly accessible to irrigation. Some people are carrying the water. So you can eliminate waste of water, and you're going to be managing – if you know how – managing or using water conserving practices, mulching, what have you. And you're going to be improving the soil typically. It's going to provide habitat for wildlife. Those are the things that come to mind.*

*P5-CGC: Well, I believe that it's better to have a garden with good soil in place of grass that you know, may not have any sort of improved ... or amendments made to the soil. So personally I would rather see a garden than a bunch of yellow grass on any public land. And what are the environmental benefits of that? Well, in a garden*

*you're doing the soil amendments. You're encouraging the whole biodiversity of the soil. You're composting. You're reducing waste in landfill sites by using the compost on a garden. You're improving the quality of the soil and a good quality soil then absorbs much more water than say hard ground or concrete ground so you're also reducing runoff water. The plants that you bring into a garden attract pollinators and so you have greater diversity around the kinds of life that you have. As well that attracts the birds. And also provides some shade which may reduce urban heat islands. If you're catching water in a rain barrel, again that's reducing water runoff. What else? And the whole sense that with increasing urbanization you're also increasing ... I'm not sure of the exact term but I'll say 'nature deprivation'. So people are affected by the lack of having a natural environment or green space that they can go to refresh themselves. And so I think having a community garden in place where somebody can just maybe go to the garden, sit and reflect, see what's going on there, watch something growing, I think helps alleviate some of the impacts of urban intensification.*

Three individuals felt UA demonstrated some positive impact on the environment but were unsure to what extent or how important it was when compared to other successes or improvements in terms of economic or social contexts:

*P2-CGC: Environmental. Let's see now. Yeah. In terms of – not that much in aggregate. It certainly keeps some more land as what you might call green space. It makes the city greener and prettier. It makes people more conscious of things such as purity of food, and almost all of them operate organically. No pesticides, and provided – I think they change values so that expectations change as well.... And I think gardening's good for you, for the community.*

*P1-CGC: That's a tough one. Because you are changing – well I guess changing something like grass, which has to be weeded, and seeded, and all sorts of stuff like that, and managed, to a garden it's often easier to manage that way. So environmentally, I think that's a net positive, but it's hard to tell whether that is an important part of it.*

*P2-PCG: Well, we took over a grassy area, so I think that's always nice, that we can diversify the terrain a little bit and add some different plants to it. But I can't really think of anything else. I mean other than the environmental aspects of growing locally, right? So now you don't have to transport this food... So... I mean it's... that's a big thing, I think.*

Broader discussions of what constitutes successful UA reiterate much of what the Waterloo Region data reveal with regards to the environmental dimension. For instance, the rise of the alternative agri-food (AAM) movement largely born out of the concern over access to healthy food and the right for individuals and communities of people to define their own food system, also known as food sovereignty (Friedland, 2010; see also Chapter 1). In addition, and similar to the discussions of social improvements and benefits of community gardening, Lawson (2005) also highlights that in addition to aspects of community engagement, community gardens have also shared elements of bringing nature into the city and ‘community greening’ concepts as well.

### ***Negative Socio-Economic or Environmental Factors***

Participants from the Region had little comment on the degree to which UA has contributed to negative results as a result of implementation. In speculation, some participants mentioned potential pesticide use, potential lack of economic return (e.g. spending more on seeds, shovels, or transportation than what could be gained from the value of a garden, and a need to address viable incomes for those who wish to make economic gains), potential disputes among community gardeners, or letting a garden go unused or fall into disrepair. One community gardener also commented how they had often traveled by car between their garden plots, citing that as an environmental negative.

Participants also pointed out factors that inhibited the establishment and maintenance of UA, such as lack of available land, especially within communities that want or need them (e.g. low-income and/or multi-family apartment communities), lack of water sources, and vandalism (see Table 4.5).

<b>Table 4.5: Factors inhibiting UA success in Waterloo Region</b>	
<b>Dimension</b>	<b>Characteristics / Examples</b>
Social	<ul style="list-style-type: none"> <li>• NIMBYism</li> <li>• Vandalism</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Obtaining funding</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Distance from garden to neighborhood</li> <li>• Land availability</li> <li>• Water availability</li> </ul>

#### 4.2.3: Participants' Most Successful Moments

Another question posed to participants in the Waterloo Region study was in regard to how successes were viewed from each individual's personal experience (e.g. "what has been your greatest success with UA?"). Responses varied, although in general, participants viewed their successes relative to two themes, such as community building (e.g. reaching out to the larger community or meeting new people), and the physical act of gardening / having gardens overall (Table 4.6).

<b>Table 4.6: Participants' Perception of their Greatest Success in Waterloo Region</b>	
<b>Theme (factor)</b>	<b>Example comments</b>
Community building	<ul style="list-style-type: none"> <li>• Became close friends, connections</li> <li>• Multi-lingual outreach/promotion of gardens</li> <li>• People coming together</li> </ul>
Physical act of gardening or having gardens	<ul style="list-style-type: none"> <li>• We actually got a garden</li> <li>• People coming together and making a garden</li> <li>• Learning to grow garlic</li> <li>• Being a part of a community garden</li> <li>• Went from 25 to 40+ gardens in the past few years</li> </ul>

Example comments are shown below:

*P1-PCG: (PCG's) greatest success was that we actually got a garden. We made a garden happen this year. I feel like we went from nothing to something significant in*

*a very few months and overcame a lot of obstacles to do it. The fact that we actually had a multicultural garden, and to make it happen was a great success, I feel like. I was quite proud of that and thrilled by it. I don't think that the biggest measurements had to do with the amount of produce or even the depth of relationships but with the reality that we did produce some produce, we did establish relationships, we built a monument to the value of that... the value of people coming together and producing and making a garden together. The fact of that is what I think is the biggest success this year.*

P2-PCG: *Well, (Member-A) and I became close friends.... See, those are the connections, right, that we talk about? So that's... that was really nice.*

P1-CGC: *So when I started on the council, I wanted to work on immigrant population, and so I helped work on a set of bookmarks which were translated into the top ten languages from the Public Health Department... And so we distributed those in various churches.*

P3-CGC: *Learning to grow garlic.*

P4-CGC: *Being a part of (a particular) Community Garden.*

P5-CGC: *I like the fact that it's gone from 25 gardens to 40 and now we have five more people interested in starting gardens, so 45 gardens. We're close to having... offering 1,000 garden plots to the community. I think that is something to celebrate.*

P1-UF: *I think it's opening up our home to people. I believe strongly in home-scale production and small production and people becoming able to provide things for one another. But opening up and becoming, in a sense, a commercial place where people come and they're buying things with knowledge from their visit invites an exchange that is so necessary.*

*So I think that's been the greatest success was just that we didn't wait to be something bigger or move to a full-fledged farm somewhere in the country. We just said we can do something now, and put it out there. And it was a tremendous response we got.*

These themes are also reflected in other documents of research focused on the Region. For instance, Wormsbecker (2008) found that gardeners enjoyed the community-related aspects (e.g. diversity/camaraderie of gardeners, inclusion of children, and reaching out into the community with food donations or using the garden to connect with community members), as well as the physical aspects of gardening (e.g. ability to fill all plots, size and location of

the garden, having sunshine, and access to water). In other research across the Region, successes as realized among gardeners were shown to be largely relative to community building and gardening practices as well, for instance: gardening as an ‘international language,’ growing culturally-relevant foods among immigrant populations, and cultivating friendships and a sense of belonging (Popovich, 2011; c.f. Lennon, 2010).

These results reinforce the underlying theme of UA in the Region, which demonstrates a strong focus on community building and its social improvement aspects. These concepts were found to overlap heavily with the mandates, goals, and visions of the multiple stakeholder groups discussed earlier, suggesting a core theme or ‘philosophy’ which underpins the UA / community gardening movement in the Region. This philosophy may best be described as akin to the *civic agriculture* framework discussed in Chapter 2, where citizens actively engage in an ‘agricultural public work’, defined as citizens who work towards creating a food system which is (Chung et al 2005:100):

- performed by a diverse group of individuals,
- for the public good, and
- done in a public space that is open to others.

#### **4.2.4: Rival Explanations**

Rival explanations were mostly present in the discussion of what factors contributed to successful economic improvement. For instance, it was unclear precisely to what extent economic success was experienced, other than three (out of eight total) Region of Waterloo participants who commented they went to grocery stores less often during the months when they were growing their own produce. Economic success (or potential success) as defined in other documents received from participants and as defined during the interviews point out

that an individual's food dollar *could* be extended; however, the degree to which a gardener's food dollar *is extended* has been largely overlooked and remains unmeasured among this study's survey population as well as in the larger context of UA in the Region. All participants felt that although environmental successes of UA in the Region existed, three participants' comments suggested that the degree to which it was experienced or contributed to overall success relative to the other dimensions was unclear.

Rival explanations also emerged relative to the discussion of the most enabling stakeholder(s). Two CGC participants felt that there were certain individuals who most contributed to successful planning and implementation of UA in the Region; whereas, the other three CGC participants cited certain organizations or groups as the most helpful. However, as discussed earlier, the human resource factor—which remains the most important success factor in this Waterloo study—is split between but tightly linked by individuals and groups.

#### **4.2.5: Conclusion: UA Success in the Waterloo Region Study**

Overall, Waterloo Region participants' comments demonstrate that dedicated and enthusiastic people—individuals and/or groups—are the single most important factor contributing to successful planning and implementation of UA. In some cases, specific individuals (“champions”) were cited as most important. These individuals and groups of people, considered human resources, come from both within the core group leading UA planning and implementation as well as from outside sources across multiple stakeholder groups. It was also noted that special UA skills or knowledge was not necessarily a prerequisite for success among the core implementing group (PCG), yet personal assistance

and expertise from outside the PCG (external human and political resources) by means stakeholder involvement contributed greatly to making a successful project.

The PCG itself, as comprised of people from grassroots groups, can be said to fit a definition of grassroots organizations that are “local political organizations which seek to influence conditions not related to the working situation of the participants and which have the activity of the participants as their primary resource” (Gundelach 1979:187).

Additionally, Canato et al (1998) point out that within volunteer organizations, two levels of membership exist: leaders and non-leaders. This also was evident in the PCG, where the core committee members took the role of leaders or “champions” of the cause as well as being more transformational, where transformational leadership is defined as a leader’s ability to garner support and participation by means of personal qualities instead of punishment and/or reward strategies (Canato et al, 1998).

In addition to key organizational and resource factors, as well as the multiple stakeholders involved who all contributed to success, certain ‘improvement’ factors were uncovered. Crime reduction, community-building, the opportunity for people (especially Canadian newcomers) to meet, and improved health and well-being were among the most cited examples of how social improvements had been made. Economics were least important or known, other than for acquiring start-up funding as well as maintaining the gardens by means of annual membership fees for each gardener. Economic improvement remains quantitatively unmeasured in this study, although there are suggestions from participants and document data that individual gardeners have ‘stretched their food dollar’ by purchasing less food from groceries while growing it themselves. Some participants also valued the aesthetic



and ecological aspects of their UA projects, but not nearly to the degree with which they understood the social improvements made in their own lives as well as in the lives of others across the broader community. This demonstrates that improvement factors—and participants’ ability to realize them—also largely contribute to an understanding of what constitutes successful planning and implementation of UA in the Region study.

Although the economic improvements of the PCGs and greater community gardening network in the Region could be considered the least crucial aspect of its success, the work of the PCG and other participants—as well as their perceptions of their greatest successes being involved in UA—link to the larger dialogue in the literature regarding the many benefits of UA (Smit, Nasr, and Ratta, 2001; APA, 2011), particularly with regard to the ‘narrative’ and discussions of the community building potential of UA. Other themes along the lines of ‘negatives’ also reflect discussions in the literature regarding barriers and challenges to UA (e.g. NIMBYism, obtaining funding and land, etc.) and have been demonstrated in other recent research across the Waterloo Region (Dow, 2006).

Another interesting finding emerged as a result of exploring each participant’s greatest success. Participant perceptions of their greatest success as a result of involvement in UA generally fell within two themes: community building and the physical act of gardening and/or having gardens. These themes were reflected in other recent research within the Region as well (Popovich, 2011 c.f. Lennon, 2010; Wormsbecker, 2008). Furthermore, these underlying themes fit with the mandates, goals, and visions of other key stakeholder groups identified as part of this study, where community outreach and

engagement, promotion and acceptance of multiculturalism, and personal health and well-being are considered very important.

Comparing the Waterloo Region participant groups to the larger UA frameworks of this study suggest that the PCG, CGC, and other participants' work could be defined as fitting broadly within the framework of *civic agriculture*. Civic agriculture (see Chapter 2) is an engagement in an agricultural 'public work' with an active role in creating a food system (Chung et al, 2005). It is also described as locally based agriculture and food production that is tightly linked to a community's social and economic development (Lyson, 2000) and that "community problem solving rather than individual competition is the foundation of civic agriculture" (Nordahl, 2009; c.f. Lyson, 2000).

This case has shown that successful UA in the PCG case is primarily linked to the factors of key individuals and groups (mostly internal to the PCG), their enthusiasm, determination, and commitment to community building. Additionally, the agricultural practices themselves—which are largely operated by hand, without chemical fertilizers or pesticides, and often perceived as 'beautifying' the city—demonstrate an understanding and commitment to improving the ecology and aesthetics of urban areas, which reflects attitudes that all participants of this study as well as some stakeholder groups share in common. Also key to the success of the PCG were the other human resources (external), financial resources, natural resources, and political resources made available via the magnitude of interested stakeholders across the Waterloo Region area, further reinforcing the community building aspects and demonstrating the degree to which the goals of the PCG and other gardens line up with and contribute to other stakeholders' goals and initiatives. Lastly, I suggest that the

scope of participant interviews, observations, analysis of stakeholders' involvement and objectives, and document data collected across the Region demonstrate that these findings can be analytically generalized to the broader community gardening network throughout the Region.

### **4.3: Findings from Agriburbia**

In the Agriburbia case, it was discovered that factors of people and economics played the most crucial role in planning and implementing UA successfully. Additionally, and as the sections below discuss at length, several other factors were found to contribute to Agriburbia's success, such as stakeholder or client involvement, resources, as well as factors of socio-economic improvement. Skilled individuals within Agriburbia and smart clients (stakeholders) who understand and value the Agriburbia concept were also found to contribute greatly to success. Participants' perceptions of their greatest success (understood as economic productivity and lifestyle themes) also helped in understanding how success was defined in the Agriburbia case.

As with the Waterloo case, this section and sub-sections following are guided by and arranged according to the research questions of this study as well as by the themes uncovered through analysis.

#### **4.3.1: Factors of Successful UA Planning and Implementation**

Participants within the Agriburbia study perceived the most important or crucial factors of success relative to two broad categories: people and economics (Table 4.7).

<b>Table 4.7: Factor Most Contributing to Success (Agriburbia)</b>	
<b>Factor Category</b>	<b>Characteristics (as cited from participants)</b>
People	<ul style="list-style-type: none"> <li>• Personalities</li> <li>• Really dedicated</li> <li>• Smart clients (external)</li> <li>• Willing, reliable, knowledgeable workforce (internal)</li> <li>• Willing to invest (external)</li> <li>• Passionate about a concept (external)</li> <li>• Talent and skill (internal)</li> </ul>
Economics	<ul style="list-style-type: none"> <li>• Economic value</li> <li>• Economically viable</li> <li>• Job creation</li> <li>• Can't depend on (volunteers or non-profits), not viable part of the food system</li> <li>• Need to create jobs</li> <li>• Economic driver that says the landscape is this way because I make money at it</li> <li>• Not greed money... creating jobs, creating economy</li> <li>• Landscape is the fuel to create economy</li> <li>• All-profit farming, not volunteer</li> </ul>

Although key people both internal and external to the company contribute to driving the Agriburbia model forward from its inception, economic incentives and viability are also very important in making Agriburbia successful in the long term. The people who contribute to Agriburbia's success are knowledgeable and skilled workers (internal to the organization) as well as stakeholders or clients (external) who understand the value.

*Q. Redmond: Personalities. I mean, really. We were all really, really dedicated. We had a couple of really smart clients that saw the economic value when we started. And then we just persevered. It makes sense to use that land for as much as it will produce.*

J. Redmond: *A willing, reliable and knowledgeable workforce.*

J. Loyd: *You can't discount that and maybe that's, honestly, the most important thing because no matter how much a person is willing to invest, no matter how passionate they are about a concept, if the economics don't allow it - so that probably has to be considered the most important factor - it has to be economically viable for them. And a project has to be economically viable and practical for it to succeed in the long run, so that's probably more important, like I said, in the long run.*

Participants further illuminated how economics are fundamental to driving Agriburbia from its inception and for continually maintaining and promoting the concept:

J. Redmond: *I think we have to address the economic dimension because if it... like I say, if you're saying it's a non-economic, whether it's the volunteer, the non-profits and everything doing that, you can't depend on it. If someone's not getting paid, the bottom line if someone's not being paid to be responsible and have the insurance that it takes to make sure the food is safe and all those kind of things, it's not going to be a viable part of the food system. I just don't think it can be. And, like I say, we need to create jobs right now.*

Q. Redmond: *Here's a key thing: Why is real estate so expensive in California? We actually looked up what is the most expensive real estate in the country, and it's Sonoma and Napa County. Well, why is it like that? It's beautiful, it's really well-tended... now why is the landscape like that? Because somebody's making money.*

*There has to be an economic driver that says the landscape is this way because I make money at it. Not greed money. It's creating jobs, it's creating economy. Once you mix that fundamental idea that the landscape is the fuel to create economy - not just to decorate—that's really where the idea originally came from. And then we just started figuring out "how" you do that. And that's the real.. all the kind of guts of Agriburbia... is how you make that happen.*

*...What we've got to do is figure out how to build the infrastructure so that it will be successful, financially successful, and not poison anybody and do that. So, Agriburbia is the design result of doing that.*

*...You're optimizing the ground, instead of something that's a cost or expensive that you've got to go mow or spray. It's like you get rent from the farmer. So the HOA or the community benefits from it because the farmer is all for-profit farming and none of it is volunteer. It's not that we don't like gardeners or gardening clubs or stuff like that, it's just that we're not gonna feed 9 billion people on... you know.. when was the last time you got volunteer brain surgery? That just doesn't happen. If you want it done right and without poison, it takes a lot of talent and skill and we need to get those people trained and making money.*

These responses from participants suggest that Agriburbia, as an economic model, operates similarly to other for-profit businesses by means of providing goods and services to their clients for a fee. Yet an analysis on this base level does not necessarily equate to a full understanding of all factors contributing to successful UA in the Agriburbia case. As will be shown, other themes emerge when probing further into the Agriburbia model through document analysis and more in-depth interview discussions. The next sections look further into Agriburbia's organizational factors, stakeholder involvement, key resource factors, as well as factors of socio-economic and environmental successes and/or negatives. Key participant's most successful moments are also discussed, followed by concluding discussions of the Agriburbia case.

### ***Structure and Organization of Agriburbia/TSR Agristruction***

Agriburbia consists of two key components: Agriburbia – the economic model and land use, planning, and design concept; and TSR Agristruction – the installation, maintenance, and operations component of their company. Agriburbia is a concept that has its beginnings in projects dating back over a decade but was officially launched in 2003 by the TSR Group (now Agriburbia / TSR Agristruction), a company of planners and landscape architects<sup>33</sup>.

Generally, Agriburbia follows the definition of agricultural urbanism: a framework for integrating a range of sustainable food systems into a community at site-, neighborhood-, or city-wide scales (de la Salle and Holland, 2010; see also Chapter 2) as well as urban form as conceived through the implications of agrarianism and food production (Waldheim, 2010).

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<sup>33</sup> See <http://www.agriburbia.com/>.

More specifically, it is somewhat similar to the garden homestead concept as described by Edelman (1942), yet Agriburbia is unique in that it includes not only the architectural and community-building aspects of agricultural urbanism, but also focuses more on ‘caloric yield’, income, and job creation (Lerner, 2011). Further, the Agriburbia model displays some characteristics of successful non-government, for-profit organizations which provide employment security, recruit and/or train a skilled workforce, or display managerial characteristics such as “high commitment, high performance, high involvement, and so forth” (Pfeffer, 1998:96).

The Agriburbia concept addresses three fundamental components of human need: transportation, shelter, and food. With this in mind, they have developed two unique food systems planning methodologies. One is the Community Food Fraction (CFF<sup>34</sup>) measurement, which is essentially a ratio of calories required and calories produced for a given geographic location. Using GIS, the CFF process can adjust for the caloric needs, dietary preferences, as well as climactic/seasonal variation when planning for local and regional food systems. Another measure is the Metabolic Distance, defined as the distance within which food can be produced, processed, and/or transported primarily by metabolic (human) means. These methods and measures have been used to conceptualize and plan for several thousand acres of new sub-divisions and/or neighborhoods, most of which are approved and platted, but still not built due to the recent financial downturn in the US economy. Agriburbia also provides services for improved food system planning and design

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<sup>34</sup> The Community Food Fraction (CFF) method is a trademark of Agriburbia.

at site specific levels such as individual lots or homes, as well as at larger, regional level scales.

Agriburbia's first steps toward planning a project are similar to other models of land planning at a base level, where housing, traffic circulation, infrastructure, and financing are all part of the process. However, the inclusion of agriculture as part of the land value—both before, during, and long-term for a development—is where Agriburbia goes beyond a basic land use planning concept by using the CFF process to understand a site's caloric yield potential.

For large-scale development, several thousand acres of land are currently being planned and designed by the Agriburbia group for developers across North America (Figure 4.7). Agriburbia (2010) incorporates many principles based on agriculture, sustainability, land planning, and design, such as:

- **Agricultural Production:** No loss of agricultural value or revenue ("Green Fields" development), or production of dietary requirements of the project or equivalent cash from sales crops, or combination thereof.
- **Locally Grown Food:** Production of a significant portion (30 to 50%) of dietary requirements grown within or in the immediate surrounding area of the community.
- **Conserves and Promotes Natural Resources:** Appropriate and efficient use of natural resources to provide housing, transportation, recreation and fresh food through creative, harmonious land planning and landscape architecture for the community. This includes use of alternative energy sources as well as land and water.
- **Self Sufficiency:** Provide a commercially viable opportunity for enhanced self- sufficiency for community residents, tenants, and guests.
- **Sustainable Energy Practices:** Integrate solar and geothermal technology to provide sustainable energy sources for the community.
- **Financing:** Incorporate established entities (Metropolitan Districts, HOAs) to finance both traditional infrastructure (streets, water, sewer) and environmentally friendly agricultural infrastructure (drip irrigation).



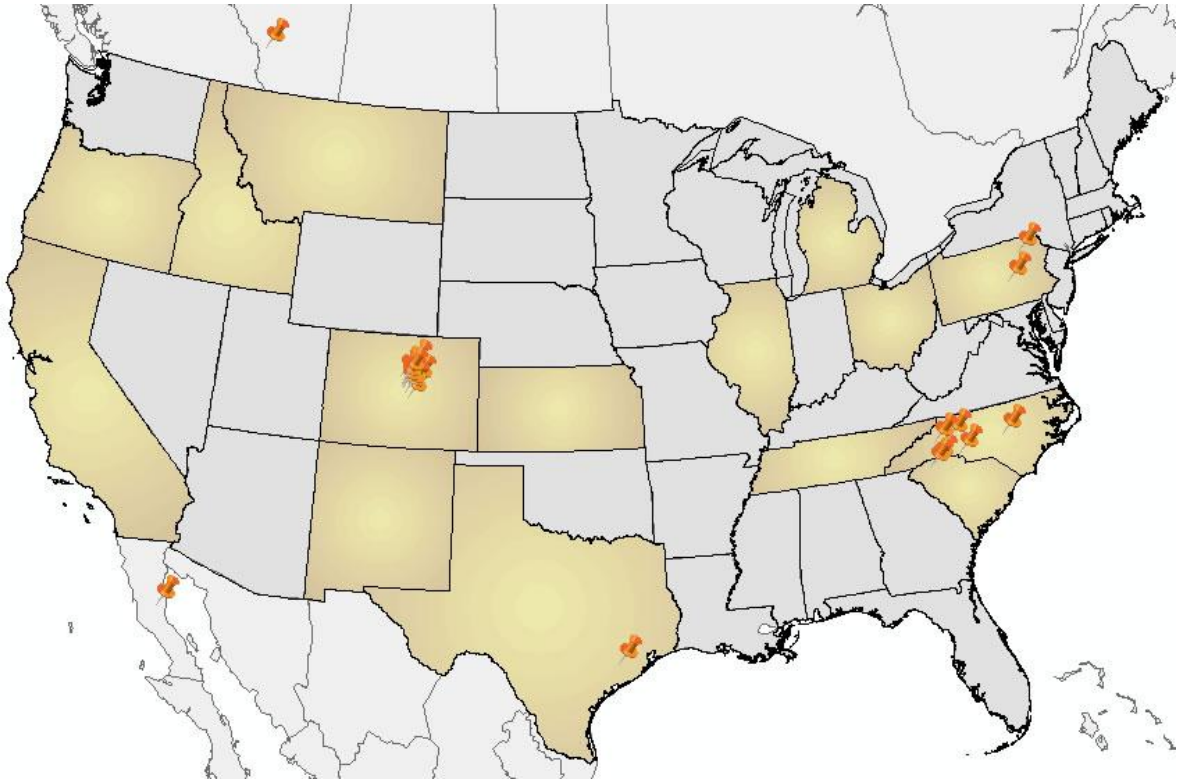


Figure 4.7: Locations of Agriburbia projects (pin-marked) and interest (shaded area) across Canada, US, and Mexico (Agriburbia, 2010). <http://www.agriburbia.com/locations.html>.

Agriburbia (2010) has:

- Approximately 5 to 10 thousand acres of Agriburbia in some phase of planning and/or entitlement (exact numbers are hard to determine due to market/banking issues).
- 10 to 14 projects in the west, primarily Colorado, but early ones in New Mexico and Kansas.
- Two projects currently in the planning stages in North Carolina and one ready for construction there.
- Interest in Agriburbia from people in at least 14 States and Canada, Mexico, and Australia.
- Interest from dozens of municipalities, counties, and other organizations around the country, including medical organizations such as Kaiser Live Well.

For existing lots or developments which seek to retrofit for UA, Agriburbia's planning and design methods are similar, albeit often at smaller scales. Typically, once an initial contract for preliminary planning services is drafted, a site is analyzed for soil quality,

water availability, topography, and overall productive potential. If the property is determined to have good potential, the next step is to prepare a site design based on the needs or wants of the client and the physical constraints of the site. Lastly, TSR Agristruction (the installation, maintenance, and operations component) handles the physical installation as well as the ongoing farming operations if the client chooses. Land use permits, if required, can also be handled by Agriburbia on behalf of the client. Weekly reports are submitted to the client with updates on work progress, what has been done, and what work will be performed in the coming week

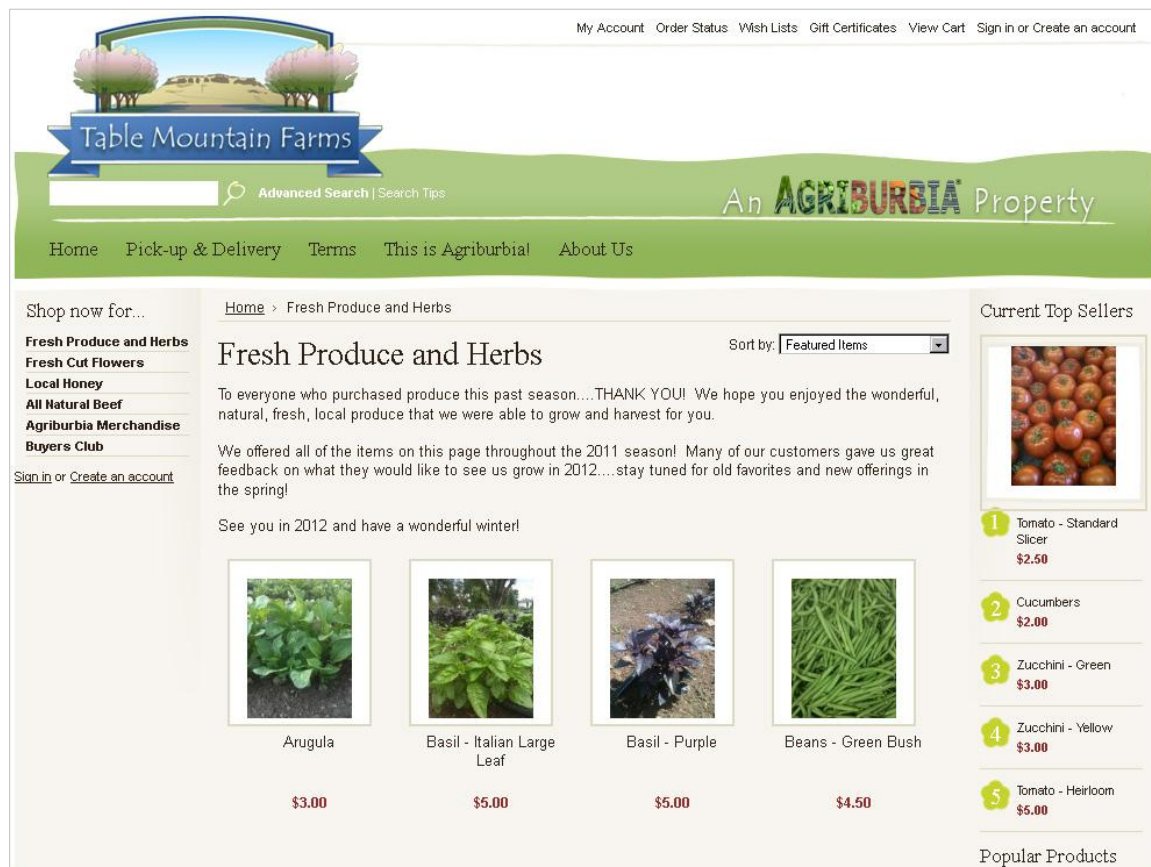


Figure 4.8: Table Mountain Farms sales website, an Agriburbia property (available: <http://www.tablemountainfarms.com/>)



*Figure 4.9: Agriburbia's main farm at the office headquarters (photo by author)*

TSR Agristruction currently maintains approximately six acres of farms across six different municipalities, including Commerce City, Greenwood Village, Castle Rock, Golden, Lakewood, and Denver (the City and County of Denver). A portion of these farms contribute to their produce sales enterprise, called Table Mountain Farms (Figure 4.8). Table Mountain Farms' main office and farm operates out of Golden, Colorado (a part of the Denver Metro), at the same office as Agriburbia (Figure 4.9). Table Mountain Farms is not a community supported agriculture (CSA) model with bulk weekly delivery. Rather, individuals can choose and purchase specific types and quantities of produce as they become available seasonally. It can be purchased online or in person and delivered if needed.

### ***Stakeholder Involvement***

As a for-profit business, the stakeholders in Agriburbia are often synonymous with 'clientele.' Key stakeholder groups—organizations that have an influence or interest in the Agriburbia concept—were identified by participants as developers, restaurants and food preparers, as well as others who generally has a use for Agriburbia produce (e.g. landowners or public schools). Municipal involvement, which was noted as enabling in some ways and

inhibiting in other ways, is discussed as a subsection below but was not found to be the most crucial stakeholder in the Agriburbia case.

<b>Table 4.8: Stakeholders (and/or clients) of Agriburbia</b>	
<b>Stakeholder Categories</b>	<b>Example</b>
Anyone with a use for the produce: <ul style="list-style-type: none"> <li>• Private landowners and/or developers</li> <li>• Institutions (e.g. schools)</li> </ul>	<ul style="list-style-type: none"> <li>• Private landowners across several municipalities in the Denver Metro and developers across the USA</li> <li>• Denver Public Schools</li> </ul>
Restaurants and food preparers	<ul style="list-style-type: none"> <li>• Restaurants across the Denver Metro and sales outlet through Table Mountain Farms to the general public</li> </ul>
Non-profits who advocate	<ul style="list-style-type: none"> <li>• Colorado Health Foundation and Denver Food Access Task Force</li> <li>• LiveWell Colorado</li> </ul>
Municipal government	<ul style="list-style-type: none"> <li>• Zoning code permitting UA uses (e.g. Denver “urban garden” use)</li> <li>• Flexible zoning districts allow sub-division planning around UA</li> </ul>

J. Redmond: *Yeah, I would say that the most enabling are the private developers that actually get it. And, you know, landowners, just private landowners. But the private side, if they get it, they are very enabling, you know, the numbers have to work. That’s the trade off, it is business and you have to have the numbers work.*

*... probably the top is a stakeholder that has a use for the produce ...So, I guess it doesn’t matter if it’s Denver Public Schools, a private citizen or the University... if they have a use for the produce. Then secondly, you could say that the next thing is to either have a contract or something like that to make sure things move.*

Q. Redmond: *...now it’s like USGBC, it’s all the ‘greenies.’ The greenies and the foodies. ...Actually, yeah, I would say, working backwards, the restaurants and the food preparers – not all of them, just some of them – but they said “wow, that’s a cool idea.”*

One participant also cited non-profits as a group who work to promote UA in cities, leading to a direct benefit for Agriburbia:

*J. Loyd: This may be a little vague because I just am not so involved in that aspect of things – this is just my very outside perspective. But there are certain people involved in non-profits that we work with that are really passionate about the concept of urban agriculture, and they do a lot to promote that to the cities to make sure that it is part of the planning that cities do – so that’s very helpful to a company like us who then get work with the cities and benefit from that agenda.*

With the exception of some non-profits, stakeholder involvement in Agriburbia is generally equitable to clientele involvement. As noted earlier, Agriburbia, as a for-profit business, requires that the economics of their model be viable not only for their company but for their clients as well. Agriburbia’s land use model and planning methodologies contribute to and overlap with common themes across the wider range of their clients and stakeholder groups. The next few subsections describe the involvement and relationship between Agriburbia and the stakeholders/clientele noted above, and some of the key characteristics of these stakeholder groups as well.

### **Developers and Development Projects**

The overarching concept of Agriburbia (the land planning model) is based on neighborhood planning and design. As such, developers with several acres who share the same commitment and philosophy as Agriburbia are key clients who contribute to a realization of the concept by investing in large-scale development. One example of such a development can be found in Milliken, Colorado. Although still not built, Agriburbia expects this 618 acre development to retain over 200 acres for intensive agriculture production. The development would ultimately contain 1,000 dwelling units, more than 150 jobs, and more than \$2 million gross income annually, primarily from agricultural production and construction (Lerner, 2011).



Another example is the Farmstead in North Carolina (Figure 4.10). The Farmstead is a 115 acre development with approximately 15 acres retained as permanent agriculture. 235 single-family units and no more than 40 units of multi-family dwellings are also planned, as well as three acres of commercial land. Open space accounts for 41 acres or 38% of the site, well over the required 15%.

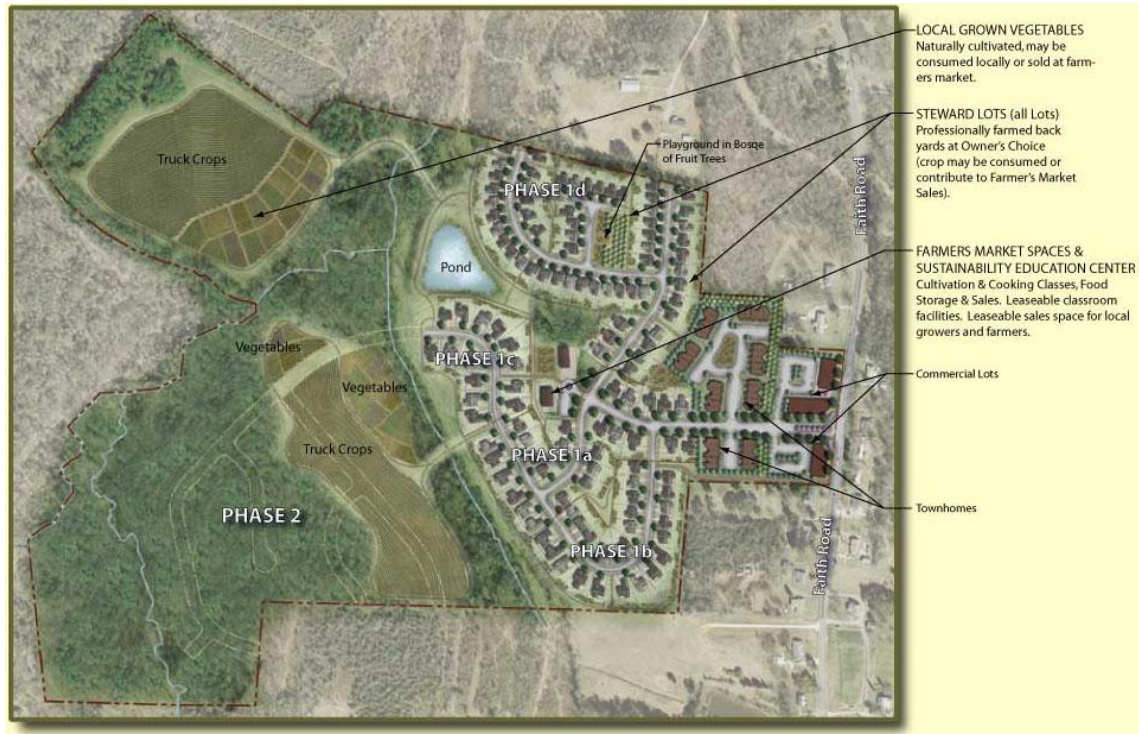


Figure 4.10: Example Agriburbia development, The Farmstead, North Carolina (available: [http://www.thefarmstead-nc.com/project\\_FS.html](http://www.thefarmstead-nc.com/project_FS.html))

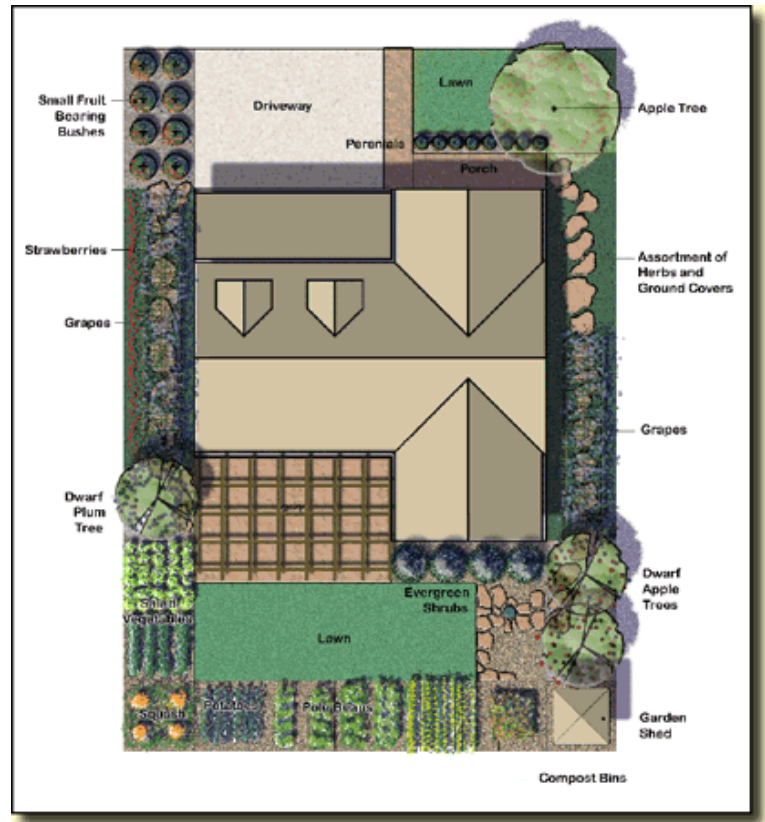


Figure 4.11: An Agriburbia 'Steward Lot' example (available: [http://www.thefarmstead-nc.com/agriburbia\\_content.html](http://www.thefarmstead-nc.com/agriburbia_content.html))

Homebuyers and residents of the Farmstead have the choice of participating in a Steward Lot program, whereby a hired farmer can maintain the agricultural production of an individual lot (Figure 4.11). The homeowner has the option of participating by maintaining the Steward Lot themselves if they choose, and keep as much or as little produce as they want or need, or let the Farmstead HOA sell it at market. Alternatively, homeowners may simply choose to keep a more traditional lawn with ornamental plantings instead of maintaining a productive farm or garden landscape on their lot.

In an interview from North Carolina WFAE radio (2009), Q. Redmond points out that the Farmstead would look similar to a traditional suburb, but with organic vineyards or

orchards incorporated into the design in addition to the several acres of farmland toward the rear of the development. In that same interview, Ed McMahon, a senior fellow with the Urban Land Institute, points out that incorporating agriculture into neighborhood design has in some ways become the new golf course development. Savvy developers realize the value in crossing over from the more traditional golf course development model—where lawn maintenance and water requirements can be extremely costly and unsustainable—and instead turn that land into a productive farmland amenity, the fruits of which can then be sold at local markets before, during, and after the land is developed and while homebuyers move in. Residents of the neighborhood can also purchase produce from the large farm located in their own community.

McMahon (2010) also points out the increase in ‘conservation communities,’ defined as communities comprised of people who love the land. The land may be forests, farms, or ranchland, for example. McMahon notes that in recent years a shift has also been made in development of value-added agricultural amenities, such as local food production with orchards, vineyards, and organic farms which have attracted a new generation of environmentally- and health-focused homebuyers. Yet, the biggest obstacle to these large-scale developments has been the banking system. As Q. Redmond notes, “I can’t execute even good ideas because the bankers in the world have screwed it up so badly” (personal interview).

### **Public Schools**

Another recent stakeholder and client of Agriburbia has been Denver Public Schools (DPS). Throughout 2011, DPS and their Facilities Maintenance Division worked with



Agriburbia to develop a plan for utilizing vacant land for food production at two school sites: McGlone Elementary and Bradley International School. Each site has approximately one acre of land now set aside for vegetable production which then feeds the students of the school. Although the growing season does not entirely overlap with the school season, fresh produce can be served in August through October from summer crops and other late-season varieties. Agriburbia acts as the company hired to plan, install, and maintain the farm, while the school district owns the produce. In another interview (c.f. Jones, 2011), Q. Redmond states:

“We do the work, the school district owns the food. The really good thing is, the money for the food doesn’t have to leave the school district. We grow whatever they tell us. We custom farm. We’ve taken a vacant, empty lot and turned it into an asset. The private sector wins, people get jobs, and the district pays about the same for food as they would otherwise, but the food is twice to three times as good.”

Agriburbia’s involvement with food planning for DPS is also part of a larger study being conducted by the Colorado Health Foundation on “how the school can actually be self-feeding” (from J. Redmond, participant interview). J. Redmond (personal interview) also states that “...they (DPS) own so much land within the city; they’re one of the largest landowners within the city. And so you’re maintaining that land, why not make it productive.” Additionally, there exist several educational opportunities with the DPS project:

*J. Redmond: ...the school community is very supportive and interested because it is an education facility and we are working with them to let them be part of seeing the production, seeing the farm, how it works. And having certain days when they will come out and see and maybe help with some of the work that’s done on the farm.*

## Non-profit Organizations

Non-profit organizations can also influence Agriburbia both directly and indirectly by advocating causes related to their common goals. For instance, the Colorado Health Foundation recently supported a publication by the Denver Food Access Task Force, a group of public and private sector leaders from the grocery industry, state and local government, economic development, and public health sectors among others. In that report, the Task Force identifies several policy concepts that Denver could pursue in order to offset the ‘food desert’ problem found in several Denver Metro areas. Among these policies, the Task Force recognizes the potential ‘urban micro-farms’ to play a role in food security and health while also boosting economic development in the form of job creation and local food sales (Denver Food Access Task Force, 2011).

In another example, LiveWell Colorado, a group “committed to informing and advancing policy efforts that create healthy places—neighborhoods, schools, and worksites—essential to supporting healthy eating and active living” (LWC, 2010), works to continually inform multiple organizations, municipalities, and the general public on a range of health issues, particularly with regard to policy topics such as food systems, the built environment, and workplace wellness. Their food systems policy strategies promote ‘farm to table’ programs in public schools as well as advocating for more healthy fruit and vegetable menu options from local sources in restaurants<sup>35</sup> across the Denver Metro.

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<sup>35</sup> One example of a Denver restaurant is Duo, advertised as “Seasonal Contemporary American: Denver’s Farm to Table Restaurant,” which offers a menu of items prepared from mostly local sources, including Agriburbia produce. <http://www.duodenver.com/>

## Municipal Government

As previously mentioned, TSR Agristruction currently farms approximately six acres across six different municipalities, including Commerce City, Greenwood Village, Castle Rock, Golden, Lakewood, and the City and County of Denver. Each of these municipalities have certain land use regulations controlling the degree to which agricultural uses are permitted or prohibited. For instance, the most urban and dense area of the Denver Metro—the City and County of Denver—has revised its zoning code (2010) to include an agriculture land use category, defined as:

...cultivation, production, keeping, or maintenance for personal use, donation, sale or lease, of: (1) plants, including but not limited to: forages and sod crops; grains and seed crops; fruits and vegetables; herbs; and ornamental plants; and (2) livestock, including but not limited to: dairy animals and dairy products; poultry and poultry products; cattle and cattle products; or horses.

Additionally, specific agriculture use types are included, such as the “urban garden” type which is defined as:

Land that is (1) managed by a public or nonprofit organization, or by one or more private persons, and (2) used to grow and harvest plants for donation, for personal use consumption, or for off-site sales by those managing or cultivating the land and their households.

When interviewed, participants commented that planning departments have not been a major obstacle to getting plan documents approved for new, master planned Agriburbia sub-divisions but cited problems getting new farms up and running within existing, built-up urban areas, demonstrating how municipal involvement can be both enabling and inhibiting:

*J. Redmond: But I would say the public side is coming along a lot slower as far as regulations and what you can or cannot do and how all that works. And it inhibits actually getting things done.*

*We haven't had much opposition to (plan submittals) going through, obviously nothing's been built yet (for new Agriburbia sub-divisions) but that's a different*

*topic. ...people want to know about the water usage, and your kind of traffic that would be there based on harvesting, and people coming in and out. And those are all typical things that you have to consider when you're doing a sub-division plan or design anyway. I can tell you, there hasn't been anywhere that we presented something that people aren't 100% onboard with what, Agriburbia, what the design would be.*

*Q. Redmond: Existing planners that have the books... I mean it's phenomenal, when you get into it, how difficult we have made it to be sustainable. ...we literally zoned ourselves into this sterility.*

*...And, even though all the planners are trying to retrofit for food now, they're all trying to figure out how to do urban agriculture, most of them don't have a clue, and think it's all like 'gardening,' and how many chickens you're gonna have in your backyard, and stuff like that. But it doesn't have anything to do with that. It has to do with not using potable water, or I don't have a water source, or like you say, I can't have a mess. But we've already written a full set of HOA guidelines and CCRs for Agriburbia. So we have a model template for them.*

*J. Loyd: ... sometimes we have a perfectly great setup where there's a nice piece of land and the homeowner wants to farm it but he lives in a residential neighborhood, so it's either illegal or financially... or just not possible for him to actually farm and sell the produce off of his land.*

*...when you're working with the cities, there are a lot of people who are very much involved in creating regulations and just regulating everything...That creates more expenses and more work for us...*

One participant further illustrates frustrations during a town meeting regarding an Agriburbia project eight years ago:

*Q. Redmond: Actually, I got laughed out of town. The very first time I went to Miliken in front of the town board, the client spent [\$] for a concept plan and all that, and the town manager made so much fun of me I had to leave the room to compose myself. Which is pretty seldom – I'm a pretty composed guy. But, that was 8 years ago and now I'm on the national lecture circuit. So, part of it is perseverance.*

Most municipalities within the Denver Metro contain some language in their zoning codes addressing agricultural uses, yet not all of them allow agriculture (a part from casual gardening) within all land use zones. For instance, the City of Arvada allows agriculture production in agriculture districts (A-1), conservation districts (C-1), and residential

countryside estate districts (R-CE)<sup>36</sup>. R-CE zones are intended to serve as a transition between open space and suburban development closer to the city. However, agricultural uses are allowed in new community zone districts (NC), which are intended to be comprised of multiple and unique uses that “set it apart from other areas or neighborhoods in the city” (Arvada LDC, 4-11).

In one documented example shared with me from the Agriburbia group, Arvada released a request for proposal (RFP) to recruit an organization for constructing and maintaining an urban farm on city owned agricultural land. The purpose of this project, as stated in the RFP, is cited below (see Figure 4.12 for the concept plan):

The purpose of this RFP is to better capture the productivity of this underutilized parcel of land by creating a community-oriented and local food production site. The intent is to find a reliable farmer who has extensive experience farming produce and would benefit from leasing, per the farmer’s site design, 5 acres from the City of Arvada for farming purposes. The parcel is owned by the City of Arvada and located at Alkire St. and 82nd Ave., Arvada, CO, 80004. The farmer will lease the land from the city for \$200/acre which includes at least 2 acre feet of water per acre from a water tap located on the property. The site will also serve as a local produce outlet for the surrounding community.

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<sup>36</sup> City of Arvada Land Development Code, <http://arvada.org/residents/land-Development-Code/>



Figure 4.12: Portion of Alkire Park master plan showing orchards, community garden, and community supported agriculture (design by Britina design group. Available: [http://static.arvada.org/docs/1306865894Master\\_Plan\\_-\\_Overall\\_-\\_email.pdf](http://static.arvada.org/docs/1306865894Master_Plan_-_Overall_-_email.pdf))

- Irrigation Water: Tap to be provided by the city.
- Fencing/Storage: Would need to be installed by the farmer. No more than two 220 square foot structures can be installed on the property. Structures over 120 square feet require a permit from the City of Arvada Building Department.
- Facilities: No restrooms are located on the property.
- Current Zoning: A-1. The A-1 Agricultural District is intended to provide areas in the City for large-lot residential uses while allowing limited production of agricultural crops and livestock.
- An educational, civic engagement component is a must.

In response, Agriburbia pointed out a few primary obstacles in making viable use of the park land based on their approach to UA. Some obstacles included:

- High start-up cost burden for the farmer (e.g. installation of drip irrigation system, buildings, fencing, and marketing) which is typically covered by the land owner (in the case of Agriburbia) and potentially low return-value on only 5 acres of land
- Need for more structures/building space than currently allowed
- Need for extended contract (typically 10 year minimum) and guarantee that the City agrees to purchase a set amount of produce (as Agriburbia has done with local public schools)
- Educational/community programs can be time consuming and costly (typically handled through other organizations, not Agriburbia)

Although other farming methods may contribute to making the Alkire farm site successful by utilizing more traditional farm techniques, this example demonstrates a commitment becoming more common among cities across North America<sup>37</sup> as they seek to address the concern over local food insecurity coupled with economic downturn. The Arvada example also reveals the multiple resource factor considerations that are necessary for a successful Agriburbia/UA project, which is addressed more completely in the next section.

Overall, Agriburbia's stakeholders are mostly comprised of clientele, with the exception of non-profits who seek to advocate causes that overlap with many of the same environmental and public health issues that government, non-government, or other private sector markets share in common. Private developers have had a difficult time in light of the economic recession of the past few years, but private and institutional land owners (Denver Metro residents as well as Denver Public Schools) have been more enabling. Additionally, the role of municipalities has been both that of governance and regulation of agricultural land

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<sup>37</sup> Efforts of this kind have increased in recent years. For example: Boston's Urban Agriculture Pilot Project/Land Lease (<http://www.cityofboston.gov/news/default.aspx?id=5188>), or Black Creek Pioneer Village Urban Farm, City of Toronto (<http://sustainontario.com/2012/01/13/8042/blog/news/trca>).

uses (which can be simultaneously enabling and inhibiting) as well as potentially providing certain resources (such as land) needed to start and maintain UA projects. The next section focuses on the key resource factors contributing to successful planning and implementation of UA in the Agriburbia case.

### ***Key Resource Factors***

As with most land development models, certain resources are required to complete the process from conceptualization to implementation. Understanding the organizational structure of Agriburbia as well as stakeholder involvement led to an understanding of key resource factor categories and their characteristics. As noted in Section 4.3.1, people and economic factors are both essential in fueling the Agriburbia model. People both internal and external to the company contribute to its success, but not without an understanding and realization of the need for the economic viability of each project. Human and financial resources are included in the table below, but other factors such as natural resources (e.g. the need for land and water) are also key in making decisions about the physical design and maintenance of a project. Political resources, as described in the previous sections related to stakeholder involvement, include advocacy (cited as largely coming from the non-profit sector) as well as zoning codes which also affect planning and implementation of Agriburbia's UA. In addition, technical resources were found to be important for Agriburbia's ability to effectively plan and design their projects. The table below lists these key resource factors and also demonstrates the connection between resources and the stakeholders and/or clientele of Agriburbia. Examples are also included, demonstrating the role of stakeholders and/or clients as a source of each resource factor category.



<b>Table 4.9: Key Resource Factors for Agriburbia</b>		
<b>Factor category</b>	<b>Characteristic</b>	<b>Example stakeholder/client contribution</b>
<u>Human Resources:</u>		
People	Smart clients (external)	Developers or landowners who understand the value of Agriburbia
	Willing, reliable, knowledgeable workforce (internal)	Agriburbia's educated and skilled staff
<u>Financial Resources:</u>		
Economic, for-profit business	Market viability and job creation	Denver Public Schools: Client pays Agriburbia for services, purchases produce
<u>Natural Resources:</u>		
Land and water	Private, public, or other institutionally-owned land	Private homeowners, developers, Denver Public Schools
<u>Political Resources:</u>		
Advocacy	Organizations promote agendas overlapping with UA objectives	Colorado Health Foundation, Denver Food Access Task Force, LiveWell Colorado
Municipal codes	Zoning and land use categories which allow UA uses	Denver's "urban garden" land use designation, or other municipalities with districts where UA could be allowed (e.g. Miliken, Colorado; Farmstead, North Carolina)
<u>Technical Resources:</u>		
Professional software	Aid in the planning, design, and maintenance of Agriburbia projects	ArcGIS to track and measure Agriburbia produce and computerized irrigation controlled remotely

The next sections give examples of social, economic, and environmental improvements of Agriburbia projects. Descriptions of socio-economic or environmental negatives and/or inhibiting factors to Agriburbia are also included.

#### **4.3.2: Social, Economic, and Environmental Improvements and/or Negatives**

As noted, participants' comments on greatest success factors had largely to do with human and financial resource aspects. This section (summarized in Table 4.10 below)

demonstrates how Agriburbia's success is also tied to evidence of successful social, economic, and environmental improvement factors.

<b>Table 4.10: Factors of social, economic, and environmental improvement in Agriburbia</b>	
<b>Dimension</b>	<b>Factors of improvement</b>
Social	<ul style="list-style-type: none"> <li>• Lifestyle: <ul style="list-style-type: none"> <li>○ Education</li> <li>○ Resourcefulness</li> <li>○ Community</li> </ul> </li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Local economic development: <ul style="list-style-type: none"> <li>○ Job creation</li> <li>○ Purchase of goods at community or neighborhood levels</li> </ul> </li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Resource conservation: <ul style="list-style-type: none"> <li>○ No use of chemicals</li> <li>○ Less use of water</li> <li>○ Less use of fossil fuels (e.g. Metabolic Distance)</li> </ul> </li> </ul>

As with broader discussions across the literature discussing the potential for UA to improve urban settings socio-economically and environmentally (Smit, Nasr, and Ratta, 2001; APA, 2011), the discussions below highlight a similar commitment and understanding from Agriburbia participants. Factors of societal improvement, although known and important to the Agriburbia land development model, were less often cited than economic or environmental improvement.

### ***Factors of Successful Social Improvement***

When asked how Agriburbia has contributed to success in terms of social improvements, participants' responses fell within the theme of lifestyle (education, resourcefulness, and community) by means of interacting with a culture focused on local food production:

J. Redmond: *I think one of the biggest ways it does is bringing food and food production closer to where... well, DPS (Denver Public Schools), where kids are, and retraining the generation that's coming up on how you actually produce things and grow things.*

*...socially I think we just need to know where – the catchphrase 'where your food comes from,' and I think that's a big part of what Agriburbia does. It also... like I say, when you connect back to being productive and back to the land, and if you do that in a community, people actually start to interact again...*

Q. Redmond: *I think one of the things that's driving it for me is that I want to give everybody that opportunity that I had when I was a kid. And, I went out and lived on ranches, and bucked hay, and whatever, long before I could even drive, and it was very rewarding. It taught me resourcefulness and that kind of thing. And you can't do that now. Kids aren't resourceful because of that. The point is that they've got to learn how to work.*

J. Loyd: *I feel like the community and the local aspect of things is probably the primary benefit. People think of local food for health reasons and things like that, but people are also very aware of the community aspect of it - knowing your farmer and having a farm nearby. Those are beautiful, valuable things to people I think - so the community aspect of it I think is the most valuable sociological aspect.*

### **Factors of Successful Economic Improvement**

In addition to the importance of economics in making Agriburbia successful overall, when asked about Agriburbia's success in terms of what economic improvements have been made, main factors included job creation and contributing to local economic development:

J. Redmond: *From an economic standpoint, there has to be an economy of paying people to do the work that it needs to take to get done. And that's just part of the model, and I think as we build these sub-divisions or Agriburbia grows, there's lots of good, green jobs out there to make it work.*

*...one of our stakeholders owns two vegetarian restaurants. That was a huge, successful project this past season because they paid Agriburbia to farm it and everything went into their restaurants. And the value they got was 30% higher than what they paid for it to be done. So, that was a huge success story.*

Q. Redmond: *...a commodity farmer would laugh at me – they do – they actually laugh at me. They say "what are you talking about, a job for every acre and a half to two acres?" I'm saying that's deliberate. We're making jobs. And, we don't have*

*to buy a half a million dollar tractor and combine. So, the economics are entirely different.*

*J. Loyd: Well, keeping money in the local economy. We're providing jobs for people and ideally income to the homeowner from their land that was formally being unused. The same thing even for the institutions, like the schools and things like that - for instance, an opportunity to keep the money local and within the school system even.*

### **Factors of Successful Environmental Improvement**

The theme of resource conservation was prevalent in the discussion of environmental improvements resulting from Agriburbia. Less use of water, decreased use of fossil fuels, and lack of chemicals were cited as the most important factors of environmental success in the Agriburbia model:

*J. Redmond: The forefront is always the water because in Colorado it's so important. But just doing the right things and not using all the chemicals and everything that you have to use when you're doing it on a massive scale. It takes that to produce the huge, huge volumes of food that get consumed in this country. So, if we can turn it and actually be producing on a smaller scale but volumes that make a difference, it's much, much better for the land and everything else as far as water usage, resource usage, and not contaminating our resources.*

*Q. Redmond: We've got to get the carbon out of food. You know, the fossil carbon out of food. How do we get people to eat without that? We call that... we coined a term—we coined lots of terms—we call that a Metabolic Distance. So how do you keep your food within a Metabolic Distance? Meaning, literally, how can I have enough of my diet within a distance you can use metabolically.*

*...In Colorado's future, in a resource constrained society where you can't drive everywhere and you can't truck everything in and whatever, the calories are constrained more by water than by land. There's lots of land. So we do comparative studies, how many calories can we create on higher, denser, calorically good foods on drip irrigation than flood irrigating Morgan County out on the plains...*

*...We gotta figure out how our calories get made with less water. Now you're talking about how to save real water. And that's part of what we're doing.*

*J. Loyd: There's a lot of ways that it's environmentally beneficial, from using as little petroleum as possible to including... and that includes the growing, right? No chemical based fertilizers or pesticides, but then also all the way to the other end where we use less fuel because we're keeping the produce local and not transporting*

*it across the country. It's low petroleum but also we're not polluting water with chemical products and things of that nature that were never intended to be in the water system. That's pretty common but very beneficial, very valuable things.*

### **Negative Socio-Economic or Environmental Factors**

Negative (inhibiting) factors emerged as participants cited NIMBYism, a need for educating the public, and finding skilled labor (social), potentially higher cost of their produce compared to conventionally-grown (economic), and a lack of treating waste plant material on-site with composting (environment) as factors contributing to perceived negative themes or factors inhibiting the Agriburbia model (Table 4.11).

<b>Table 4.11: Factors inhibiting UA success in Agriburbia</b>	
<b>Dimension</b>	<b>Negative (Inhibiting) factors</b>
Social	<ul style="list-style-type: none"> <li>• Expectation of value (need for education)</li> <li>• Food illiteracy</li> <li>• NIMBYism</li> <li>• Locating skilled labor</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Local organic produce can be more expensive than conventional produce</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Need for addressing compost on-site</li> </ul>

Participants noted the need for more awareness and education of the value of Agriburbia across multiple stakeholder or client groups, for instance:

*J. Redmond: ...probably the hardest thing is setting the correct expectation for what the economic benefit is going to be for doing Agriburbia. It takes a lot of work and you might not get that return that you thought you would.*

*So, that's probably the biggest negative side about where we are and what we're trying to do is setting the expectations for the value, economic mostly. I mean, the production is not a problem and people love to see things growing and that's always a positive thing, but when it really comes down to the fact that it takes money to do it and you need to make money doing it, that can kind of be negative at some point.*

Q. Redmond: *The negative results are usually NIMBYs in neighborhoods that want to convert. So, you'll have – like, a great story I tell everybody – we bought this place and started converting it. We built that hoop house out there. And sure enough, the hoop house is up for maybe two or three days, and the enforcement planner from Jefferson County comes up the driveway. He's got his measuring tape, and he's gonna figure out some infraction. They couldn't find anything wrong, literally. People complained about their neighbor, and they didn't want to do anything about it. They don't want to come over and to confront us and.... Societally we're just like that.*

J. Loyd: *...some of the pushback we get is that local, all naturally grown food is more expensive than conventionally grown food... for the large grocery stores. We do have a little bit of education responsibility to educate people that there's a reason why it costs more, and that it is worth it.*

Other challenges to Agriburbia's success included the public's lack of understanding of the process and value of local food, as well as lack of 'food literacy' among potential clientele.

Again, all participants stressed the importance of a project's financial viability and the need for educating the public:

J. Redmond: *A challenge is to make that final piece work, because if you're not selling it, the model doesn't work. It slows right down the chain. So, like I say, I think working on that side of things has been one of the bigger challenges to get people to realise that it's not always going to be able to come from California, you know. You've got to start that mindset change now and make sure it's better food and everything else that goes along with it.*

*You know, we actually have the people in the field, and we actually have to deliver, and we actually have to package as much as we package in the bins or whatever. So, you can see all those costs, and what does it really cost, and what are you really getting, and do we really have that supply chain. And there's a need for... I mean, there's people who want it, but they have to understand what it takes to get it to them and, you know, what is that model. So it's been very interesting.*

Q. Redmond: *The banking problem. It's the worst... it's just too much. And that's why I say... you know, I get really frustrated, and it's because I can't execute even good ideas because the bankers in the world have screwed it up so badly.*

*...You have to be a foodie... that's one of the things you could put down for one of the impediments is the poor state of kitchen literacy, or the poor state of food literacy. All the people that buy from us are foodies.*

Two participants pointed out the challenge in finding skilled labor for their farm crews, as well as one citing the need for addressing improved use of plant-waste material (compost):

J. Redmond: *Like the people that we hire on our farm crews, they want to know and want to do it, but they have no clue what it takes to grow something. So, that's been really interesting for us to see people that actually learn how to do things, learn what it takes to put food on the table, per se.*

J. Loyd: *...we would love somebody with farm experience, but honestly, it was hard to find. I don't think there's a large pool of labor candidates out there right now that have a lot of actual farm experience. A lot of landscaping experience, tons of that, but actual farming experience with knowledge of plants or weeding or even weed identification, or some of the specific heavy equipment that we would use for farming versus landscaping. It wasn't a large pool.*

*...And then the large scale agriculture, the skill set that those labor crews have is just so different than what we're working with - the irrigation systems that they're working with out there are so different than the drip irrigation systems that we're working with here; it's different.*

*... right now we're struggling to deal with our plant waste better, you know, hit a better capacity. The plan is... was and is, is to remove all the plant material at the end of the season and shred it and compost it, and we're just running into all kinds of problems with that. But we're determined to find a way to easily compost all the plant materials from all the farms, on the actual site of the farm - you know, not having to transport it across town to here, to Golden, to deal with it.*

#### **4.3.3: Agriburbia Participants' Most Successful Moments**

When asked “what has been your greatest success with UA,” participants felt it had to do with the success of the urban farming itself and the creation of an economic model that works, as well as the success of generating an idea of living that resonates with people so positively, contributing to an understanding of two key themes: economic productivity and lifestyle (Table 4.12).

Table 4.12: Participants' Perception of their Greatest Success in Agriburbia	
Theme	Example comments
Economic productivity	<ul style="list-style-type: none"> <li>• Model to-date that actually creates jobs and produces abundant, wonderful, local, natural food</li> <li>• Getting it sold to complete the economic model</li> <li>• We're out there literally farming in urban areas, we're selling produce to the general public</li> <li>• We're giving people jobs in agriculture</li> </ul>
Lifestyle	<ul style="list-style-type: none"> <li>• Making sure that people understand what's being created, and how it can be used</li> <li>• This isn't for the elite, this is for everybody</li> <li>• Everybody sees the concept that way... 'Amish' in thought or character, and 'Steve Jobs' in execution</li> <li>• Leaving a legacy</li> <li>• "I wish I lived there."</li> </ul>

J. Redmond: *I think the greatest success that we feel right now is the fact that we've created a model to-date that actually creates jobs and produces abundant, wonderful, local, natural food. I mean, there's good jobs being created and we're creating great food. So now it's just bringing everything full circle and making sure that people understand what's being created, and how it can be used, and getting it sold to complete the economic model.*

Q. Redmond: *Well the biggest project success so far would be the one in Charlotte (North Carolina – The Farmstead) even though it's not built. I'm quoted in there saying what we're trying to do is build the infrastructure for a Jeffersonian life. You're self-resourceful, you're not just a doctor or lawyer – this isn't for the elite, this is for everybody. So, that's one of the successes, is that everybody sees the concept that way... What we're trying to do is build something that's 'Amish' in thought or character, and 'Steve Jobs' in execution. I'm not giving up my iPhone and we don't want anyone to give up their iPhone. We just think that the fundamentals of how you get food can be done much better.*

*...I was talking to somebody today, and he said, "I just want to leave a legacy for my kids that's not a Pentium chip computer. That's no legacy on my part." I said, "Yeah, the legacy on your part is a Steward Lot that feeds them and does something for the community."*

Interviewer: *So conceptually, the success there is... the lifestyle?*



Q. Redmond: *Yeah, it resonates. I don't know how to transcribe this into words for you, but, personally, I give the lecture, and there's like dead silence, and then there's this audible sigh every time. "I wish I lived there." And it just gets everybody.*

J. Loyd: *I think that it's the fact that we're making it happen. We're out there literally farming in urban areas, our farms have been successful, we're selling produce to the general public, and we're re-educating people. We're literally, actually making it happen; we're giving people jobs in agriculture. And I think that's really valuable because it's setting an example and a model for people to see that it can work, it is working, it is happening and that it will encourage other people to try things and to actually do it - so we're setting an example that urban agriculture is beneficial and can work.*

These comments and the themes generated from them reflect certain characteristics of other UA frameworks as discussed in the Chapter 2; namely, that of *agricultural urbanism*, defined as a framework for integrating a range of sustainable food systems into a community at site-, neighborhood-, or city-wide scales (de la Salle and Holland, 2010) as well as Waldhiem's (2010) concept of space conceived of and built around the implications of agrarianism. The economic viability of the Agriburbia model is crucial, but not without an understanding of the choices and commitment that must be made in order for the model to be productive: stakeholders and clients contributing to Agriburbia's success must also shift their thinking with an understanding that comes from being educated about the many improvements to the socio-economic and environmental contexts of urban settings, and thus, the benefits gained by those who contribute to and participate in the Agriburbia model and concept of living.

#### **4.3.4: Rival Explanations**

Agriburbia participants' responses to the question of socio-economic negatives and key stakeholders revealed some rival explanations. For example, two participants felt that lack of proper economic expectations and lack of understanding the value of the Agriburbia

system was the major negative, while another felt NIMBYism was the major negative. With regard to key stakeholders, participants cited restaurants or food preparers, public and/or private institutions, or generally anyone with an interest or use for the produce as key stakeholders contributing to Agriburbia's success, while another stated that non-profit organizations were a key stakeholder, since they can be strong advocates for UA and pursue and encourage policy agendas from which Agriburbia benefits.

#### **4.3.5: Conclusion: Factors of UA Success in Agriburbia**

Agriburbia, a socio-economic planning and design model focused on agriculture in and around cities, is essentially an *agricultural urbanist* concept: a framework for integrating a range of sustainable food systems into a community at site-, neighborhood-, or city-wide scales (de la Salle and Holland, 2010; see also Chapter 2). Additionally, Agriburbia participants often cited examples of how beneficial UA can be across socio-economic and environmental contexts, further strengthening the discussions in the literature of the multiple benefits of UA (Smit, Nasr, and Ratta, 2001; APA, 2011) while also demonstrating how to plan for the economic success of UA.

In summary, Agriburbia relies heavily on economics (client investment as well as long term capital gains within a for-profit business model) in order for their projects to be successfully planned, implemented, maintained, and ultimately productive. Nevertheless, motivated and dedicated individuals and/or stakeholder groups play a large part in driving a project from its inception as well as in the long term. Key 'resource' factors as understood from an analysis of Agriburbia's organizational structure, the stakeholders/clients identified, and participant interviews reflect some broader discussions in the literature of what factors

influence the creation of UA, such as land, people, or funding sources, etc. (Smit, Nasr, and Ratta, 2001; APA, 2011). Equally important, and a key point in Agriburbia, is an understanding of what ‘improvements’ are made as realized across dimensions of society, economy, and the environment of urban areas. These improvements contribute also to benefits gained by not only the Agriburbia company itself but stakeholders and clientele as well. Thus, knowing what improvement factors exist and are demonstrable among the Agriburbia participants contributes further to understanding what constitutes their success in planning and implementing UA. Agriburbia’s most cited improvements are found across dimensions of economy (job creation) and the environment (less resource consumption). Social improvements followed a theme of lifestyle, also a common theme among the greatest success as realized by participants.

Participants’ perceptions of their greatest successes further reveal underlying themes relative to economic productivity as well as lifestyle, suggesting a concept which falls in line with other discussions of what UA broadly espouses to achieve from the point of view of ‘agrarianism’; or, as one participant more specifically stated, a self-reliant or ‘Jeffersonian’ life. However, a complete shift in an individual’s philosophy or lifestyle is not ultimately required in order to embrace Agriburbia’s UA model (e.g. “...we’re not asking anybody to give up their iPhone.” – Q. Redmond, personal interview). Rather, stakeholders or clients of the Agriburbia model primarily need a dedication to the idea as well as an understanding of the economic and environmental value of a local food economy.

#### **4.4: Cross-case Comparisons**

For this section, the Waterloo and Agriburbia cases are compared and analyzed. Comparisons follow the sections as presented in previous sections: overall factors of successful UA planning and implementation, stakeholder involvement, and key resource factors are the primary comparison categories. Additionally, factors of socio-economic and environmental improvement success (and/or negatives) are compared, followed by participants' perceptions of their most successful moments.

Across both cases, and overall, the most commonly cited factor contributing to successful planning and implementation of UA was dedicated, enthusiastic, and/or willing people. In the Waterloo case, individuals and groups were cited as most important and very closely tied, whereas in the case of Agriburbia, people and economic factors were the most important and equally dependent on one another. The people most enabling to success in Agriburbia required an understanding of its economic value, whereas people in the Waterloo case primarily needed an understanding of and commitment to building community regardless of whatever material or economic gains may result from implementing a community garden.

Comparing and contrasting this study's cases also revealed that community gardening in the Waterloo Region and UA as practiced by Agriburbia share common success factors of people who are enthusiastic and dedicated; however, the biggest difference was found in how economics played a role in determining success. The success of community gardens and their impact on local economics remain unknown in the Waterloo study, whereas examples of (and the need for) economic viability and improvement underpin the rationale for

Agriburbia both as a land planning and design model as well as an urban farming retrofit for existing, built-up urban areas. Both studies revealed similar themes with regard to environmental stewardship themes which emerged in both studies, understood as ecology and aesthetics in the Waterloo case and as resource conservation in Agriburbia.

Organizational and leadership roles of the PCG and Agriburbia differ fundamentally. The PCG represents a grassroots, volunteer-based organization where technical skill or in-depth knowledge of UA are not prerequisites to success, whereas Agriburbia follows a for-profit business model and does rely on the skills and knowledge of its workforce and the technical resources (e.g. planning and design software) which accompany them. The PCG leadership model—understood as transformational leadership—garners volunteers and support by means of personal qualities instead of punishment/reward, whereas the Agriburbia model displays the characteristics of successful organizations which may, among other things, provide employment security, recruit and/or train a skilled workforce, or display managerial characteristics such as “high commitment, high performance, high involvement, and so forth” (Pfeffer, 1998:96).

Stakeholder involvement was important to success in both cases. Stakeholders in the PCG study were by and large institutions and organizations considered charitable/non-profit and/or grassroots groups, whereas Agriburbia was largely dependent on stakeholders (clients) who invest in the Agriburbia concept. Nevertheless, the stakeholders/clientele of Agriburbia included schools, private developers, as well as some non-profits who can indirectly affect Agriburbia by means of political advocacy of policies and programs which encourage healthy living and eating in and around cities. The same was also true with the PCG: charitable/non-

profit organizations contributed greatly to the community garden cause as well as schools (e.g. Wilfrid Laurier Northdale campus). Municipalities have also contributed to success of at least one garden on Waterloo City land, although substantial contribution directly to Agriburbia's success by means of city involvement was not apparent, other than through zoning codes allowing agricultural uses in some Denver Metro municipalities.

'Quality of life' is a theme which emerged from the Waterloo study that does equate somewhat to the 'lifestyle' theme uncovered in the Agriburbia analysis. However, differences exist with regard to 'lifestyle' as understood in the Agriburbia model and 'quality of life' in the Waterloo community gardening examples. For instance, joining a community garden in Waterloo typically does not demand any significant change in an individual's day-to-day lifestyle, except for some shift in routine in order to participate and maintain a plot within a garden. The focus on community gardens as places where people from varying walks of life come together to share in a gardening experience suggests that each individual's own unique contributions create a 'mosaic,' or, more literally to this study, a 'patchwork' of people who are somewhat bound together by gardening yet otherwise maintain their own unique cultural identity or lifestyle.

Somewhat conversely, the idea that Agriburbia promotes self-sufficiency or a 'Jeffersonian' life is more indicative of a lifestyle choice, particularly with regard to how it encourages the participation in a local food culture by means of owning a lot in an Agriburbia subdivision, maintaining a Steward Lot, and/or contributing directly to local or neighborhood level economics by purchasing produce from an Agriburbia farm. However, the use of the term 'lifestyle' here is not meant to suggest that Agriburbia stakeholders or

clientele must undergo a paradigm-shift in the way they live. As one Agriburbia participant stated, "...we're not asking anybody to give up their iPhone" (Q. Redmond, personal interview); in other words, adopting a radical or utopian idealism or embracing a 'back to the land' ethic is not necessarily a prerequisite for participating in the Agriburbia lifestyle.

Comparing the specific forms of UA present in each study also revealed significant differences. For instance, Agriburbia's agricultural urbanist model promotes typologies of farming ranging from Steward Lots of several square feet to urban farms of several acres in size. On the other hand, the PCGs are community gardens comprised of several distinct plots for which individual gardeners are responsible. The scale of the PCGs and many other community gardens generally fall within the range of less than half-acre sizes, while many of Agriburbia's farms are at least an acre or more each. On the other end of the scale, Agriburbia's master planned communities are often several hundred acres in size of which dozens of acres are set aside for long-term urban farming enterprise with the intent of feeding the community and/or local population.

Using the data tables developed for each case previously in this chapter, a new table is presented here (Table 4.13) for comparison of both cases (see also Appendix G for a more comprehensive chart outlining all factors, their characteristics, and examples for comparison). Factors of success here are summarized and compared in terms of the overall success factor(s), success factors in terms of resource requirements, success factors in terms of improvements, and key enabling stakeholder characteristics. All of these factor categories are further defined relative to the social, economic, and environmental dimensions. The case

comparisons show that the main differences occur largely across the categories of organizational structure, economic dimension, financial, and technical resources.

<b>Table 4.13: Overall Case Comparison of Factors (condensed)</b>	
<b>Patchwork Community Gardens</b>	<b>Agriburbia</b>
Category (with example)	Category (with example)
<b>Organizational structure</b>	<b>Organizational structure</b>
Grassroots, charitable, ‘non-expert’ members	Non-government, for-profit, ‘expert’ staff
<b>Stakeholders/members</b>	<b>Stakeholders/clients</b>
<ul style="list-style-type: none"> <li>• Key individuals</li> <li>• Community groups, charities, and grassroots organizations (The Branches, ACWI)</li> <li>• Funding institutions (TD Bank)</li> <li>• Other Institutions (Public Health, University)</li> <li>• Municipal government</li> </ul>	<ul style="list-style-type: none"> <li>• Anyone with a use for the produce (private landowners, Denver Public Schools)</li> <li>• Restaurants and food preparers (showcasing local food)</li> <li>• Non-profits (who advocate)</li> <li>• Municipal government</li> </ul>
<b>Resource Factors</b>	<b>Resource Factors</b>
<u>Human Resources:</u>	<u>Human Resources:</u>
People (individuals and groups) with commitment, passion, and provide other resources	People (internal and external) who see the value, are willing, and have knowledge
<u>Financial Resources:</u>	<u>Financial Resources:</u>
Start-up funding (grants)	Profit
On-going funding (garden member fee)	
<u>Natural Resources:</u>	<u>Natural Resources:</u>
Land and water	Land and water
<u>Political Resources:</u>	<u>Political Resources:</u>
Advocacy	Advocacy
Policies and/or bylaws	Zoning and land use regulation
<u>Technical Resources:</u>	<u>Technical Resources:</u>
n/a	Professional software for planning and design
<b>Improvement Factors</b>	<b>Improvement Factors</b>
Social: Quality of life (community building,	Social: Lifestyle (education, resourcefulness,



well-being, decreased crime)	community)
Economic: Quality food for less cost	Economic: Local economic development (job creation)
Environmental: Ecology (less resource use and biodiversity) and aesthetics (beautification of urban settings)	Environmental: Resource conservation (less water or fossil fuel use)
<b>Inhibiting/negative Factors</b>	<b>Inhibiting/negative Factors</b>
Social: Lack of understanding or respect (NIMBYs, vandalism)	Social: Lack of understanding or skill (NIMBYs, skilled labor)
Economic: Obtaining funding (competitive grants)	Economic: Cost vs. value (local produce more expensive)
Environmental: Land and infrastructure location, land tenure	Environmental: Handling resources effectively (need for improved composting)
<b>Participants' Most Successful Moments</b>	<b>Participants' Most Successful Moments</b>
The community building aspects	The economic productivity (model that works)
The physical act of gardening or having gardens	The lifestyle ('Amish' in thought, 'Steve Jobs' in execution)
<b>UA Framework</b>	<b>UA Framework</b>
Civic agriculture	Agricultural urbanism
<b>Form/typology</b>	<b>Form/typology</b>
Community gardens	Urban / neighborhood farms

Table 4.13 (continued)

Comparison further revealed more similarities of success in terms of improvement factors and fewer similarities among disabling factors. For instance, the factors of community-building and education (social dimension) by means of UA were evident across both study areas. In contrast, differences existed with regard to how funding (economic dimension) contributes to success, such as the need for not only start-up capital among the PCG, but also long-term operating capital and profit in the Agriburbia model.

In comparison, all Agriburbia participants stressed the importance of the business model (economic resource factor), and the need for that to work long-term, as well as pointing out how Agriburbia's success has been realized through local economic development and job creation (economic *improvement* factor). Social resource factors included the need for dedicated individuals, as well as skilled labor. Environmental resources included land that is close enough to the consumers who need them as well as water (an increasingly scarce commodity in Colorado). Additionally, evidence of economic improvement also played a large role and was closely tied to describing success among Agriburbia participants. On the other hand, economic success in terms of known or discernible economic improvement was not cited as the most common or important success factor among Waterloo participants; rather, the community-building capacity of UA in Waterloo was by far the most essential factor, with participants often citing economic gain to be the least important or least evident factor.

This cross-case analysis has described what factors contribute to successful UA planning and implementation by showing how UA is tightly linked to building community (quality of life or lifestyle), local-based economics (stretching the food dollar or job creation), and environmental stewardship (urban ecology or resource conservation). Several factors contribute to successful planning and implementation of UA, the most crucial of which are dedicated and enthusiastic individuals and groups of people. In addition, several stakeholders who share common objectives can contribute to UA success from across multiple scales and disciplines. This analysis shows that successful UA is also linked to how projects demonstrate some discernible socio-economic and environmental improvement

within their organizations, local communities, or cities, suggesting that UA—if it is to be successful—should be a socially relevant, economically resilient, and environmentally sound food system. Recommendations for how these findings can contribute to future planning and implementation of UA—as well as the role GIS can play in UA planning—are discussed in the next chapter.

## **5.0: DISCUSSION AND CONCLUSION**

### **5.1: Introduction**

This research used multiple-case study analysis of urban agriculture (UA) in two distinct North American areas—the Region of Waterloo, Ontario, and the Denver Metro Area, Colorado—to determine what factors contribute to successful planning and implementation of UA. These cases focused on a grassroots, volunteer community garden group (in the Waterloo Region) and a for-profit agricultural urbanist organization (in the Denver Metro Area).

This research has demonstrated that successful UA planning and implementation as demonstrated across both cases in this research is primarily a factor of the dedication and enthusiasm of individuals and groups of people. Additionally, resource factors (e.g. land, water, funding), as well as stakeholders (grassroots organizations, institutions, and for-profit businesses) also play a key role in actuating successful UA. This study also shows that successful UA is achieved not only or even primarily by means of municipal policies or programs, but also actively ‘on the ground’. Additionally, success was shown to be relative to the extent to which socio-economic and environmental improvements in urban areas were demonstrated, with the major difference between each case being the degree to which economic improvements were made (Agriburbia relying more heavily on the factor of market viability whereas the PCG/community gardening of Waterloo Region tends to rely mostly on start-up funding for implementing new gardens).

Although these cases cannot claim to be statistically generalizable to North America, the analysis revealed that factors common to both cases suggest some analytical

generalization can be determined between the cases themselves as well as to the UA literature more broadly. With this in mind, some recommendations for public and/or private sector planners are presented in the next sections.

## **5.2: Recommendations for Practice**

Another question of this research seeks to understand how factors of success can guide future UA planning and implementation. At the municipal level, several cities have begun to offer more UA-friendly zoning and land use bylaws over the past few years. Even within this case study research, both the Waterloo Region and the Denver Metro Area show examples of enabling bylaws which encourage and/or allow certain UA uses (see Appendix D for Denver Zoning Code example). But zoning is only one tool by which municipalities can encourage and support UA. Similarly, for non-government organizations (NGOs), successful UA is more than simply growing food in a city. Successful UA is tightly linked to building community and environmental stewardship. Community gardening offers both of these, but economics are often not addressed to the extent which they can boost or improve economic development within cities. On the other hand, UA as practiced by Agriburbia or other for-profit models do directly impact local economies while offering social and environmental improvement potential.

Cities and NGOs should not overlook the capacity of community gardens to contribute to quality of life and environmental stewardship, nor should they be considered inept at addressing local economic development since evidence does support the notion that community gardens can, at the very least, offset some food spending during a growing season, as is the case with the Kitchener Allotment gardens on city land discussed in the

previous chapter. However, scale and context come into play when attempting to understand how UA policies or programs should be implemented at government and non-government levels. Planners—both in private practice and public service—should examine their local food environment (Forsyth et al, 2010) more closely. Planners can ask who wants or advocates for these urban food systems, and what are their needs? Naturally, land and water are important resource factors; but an implementing group's organizational factors and core objectives, key stakeholder involvement or clientele, an understanding of market potential, and the potential for socio-economic and environmental improvement also factor into making UA successful.

NGO planning and design practitioners may be leading the charge for creating successful UA across much of North America at present, but this research and broader discussions in the UA literature show that municipalities have the potential to provide a great deal of resources to enable UA. Zoning codes or bylaws are enabling at one level, yet what is also needed is a commitment from municipal departments to create and carry out UA policies as UA continues to (re)emerge across so many North American cities. Municipal governments might come to realize urban food systems as analogous to other public recreational or health initiatives (e.g. parks and open space, city-funded community centers) or as similar to other municipal infrastructure needs (e.g. roads and utilities) and thereby incorporate UA into their policy planning strategies.<sup>38</sup>

Chapter 2 discussed several reasons for (or factors of) where planning succeeds in its attempt at implementing policy. For instance, Mazmanian and Sabatier (1983) list several

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<sup>38</sup> Similar to another framework as described in Chapter 2 – Continuous Productive Urban Landscapes (CPULs).

factors which can be used to determine the likelihood a policy will be successfully implementing. Two factors in particular are cited as ones which “must always be met at least moderately well” (1983:41-42), for example:

1. The enabling legislation mandates policy objectives which are clear and consistent or at least provides substantive criteria for resolving goal conflicts.
2. The enabling legislation incorporates a sound theory identifying the principal factors and casual linkages affecting policy objectives and gives implementing officials sufficient jurisdiction over target groups and other points of leverage to attain, at least potentially, the desired goals.

Furthermore, the American Planning Association (APA, 2011:50) suggests four policy categories that can contribute to improving UA implementation success:

1. Nonzoning regulations that affect the use of private land for agricultural activities (e.g. animal control, composting activity)
2. Land-use policies that permit public and to be used for gardens or farms
3. Land-disposition policies that permit surplus properties to be acquired for urban agriculture
4. Policies and regulations that strengthen the infrastructure of widespread urban agriculture

The Region of Waterloo and the Denver Metro have recently demonstrated efforts that fall in line with the above policy strategies. For example, the Region of Waterloo now has a policy to “encourage and support” community gardens, and one Denver Metro municipality (City of Arvada) recent posted a request for proposal from any interested group to lease and operate an unused portion of city open space as a community farm.

Another question emerging during the course of this study was “how can UA success be measured?” To demonstrate a possible answer to this, the next section uses the PIE method (Chapter 2) as applied to the EMS community garden permitting process, showing how to ‘score’ or measure implementation success from the municipal level. Additionally,

and tertiary to this study, is the question of how GIS can be used for UA (UAGIS). Two examples are given. The first example is taken directly from Agriburbia (the Douglas County Agriculture and Baseline Food Study). The second example is my own use of UAGIS as applied to the City of Waterloo to demonstrate a prototype of an Urban Agriculture Land Inventory and Analysis.

### **5.2.1: Measuring Success: the PIE Method**

This section measures the degree to which a community garden was successfully implemented in May, 2011, by the Patchwork Community Gardens (PCG) group. The garden (EMS site) was installed on land currently owned and maintained by the City of Waterloo and was once an ambulance station, now used mostly for storage or repairs.

As presented in Chapter 2, several methods can be used to measure and evaluate the degree to which a plan or program has been successfully implemented. For this section, the evaluation was based on and modified from the Planning Implementation Evaluation (PIE) method (Laurian et al, 2004) and was used to demonstrate the *implementation depth score* of the garden installation at the EMS site. This method has been recommended for its ease of use and relevance from an object-oriented and conformance perspective of implementation success by municipal planning departments.

Laurian et al (2004:472) define plan implementation as “the degree to which plan policies are implemented through the application of specified development techniques in planning practice”. Their PIE methodology is used for evaluating the implementation of plans and contains five main steps. Below is a review of the PIE method outline (see also



Chapter 2), with specific notes relative to the EMS garden site in parenthesis where applicable:

- 1. Selection of issue(s)**
  - a. Identification of the issues of interest (*encourage and support community gardens*)
  - b. Identification of the relevant sections of the plan
- 2. The plan and plan policies**
  - a. Identification of relevant policies (*Community Gardens: Region of Waterloo Official Plan Policy, Chapter 3; and City of Waterloo Official Plan Policy, Chapter 8*)
  - b. Identification of relevant techniques that address each policy
    - i. (*grant access to land,*
    - ii. *provide resources such as rain barrels, composting bins, compost, wood mulch or other forms of in-kind support,*
    - iii. *promote awareness, and/or*
    - iv. *collaboration with stakeholders*)
- 3. The permits**
  - a. Selection of permits that deal with the issue (*EMS site permit*)
  - b. For each permit, identification of the techniques used and the policies implemented
- 4. Linkages between plan policies and permits**
  - a. Evaluation of policy implementation in each permit
- 5. Calculation of implementation indicators**
  - a. Implementation breadth: proportion of policies ever implemented
  - b. Implementation depth: proportion that are implemented by each permit (*see below*)

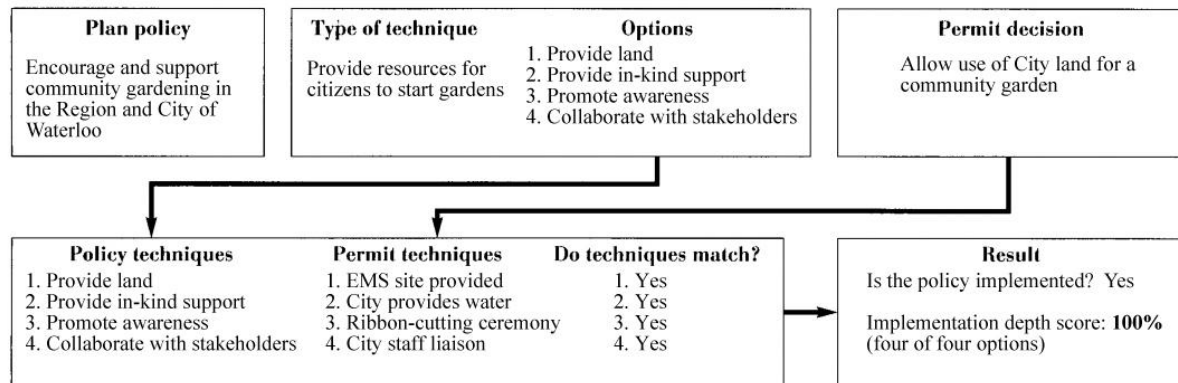


Figure 5.1: PIE method applied to community gardening in the Region and City of Waterloo (by author, modified from Laurian et al, 2004).

Although the PIE method illustrated above (Figure 5.1) demonstrates a 100% (four out of four options) implementation success at the EMS site, it should be noted that it does not demonstrate the *quality* or degree to which the municipality was supportive or encouraging, nor the barriers or challenges experienced along the course of the implementation process. In summary, Laurian et al (2004) and the PIE method largely respond to Talen's (1997) call for more empirical measures of implementation success from a municipal planning and conformance/object-oriented perspective. Although the PIE method is suited for measuring success relative to how well policies enable the implementation of plans via permits, it allows little room for addressing the quality of other factors across several categories (e.g. resource factors, stakeholder involvement, improvement factors) that can contribute to making a UA project successful as well, and should be taken in consideration alongside other factors as discussed in this research more broadly.

### **5.2.3: GIS and Food Planning – A Case from Agriburbia**

As demonstrated in Chapter 2, GIS offers many opportunities for food systems planning at multiple scales. In one recent example, Agriburbia prepared the *Agriculture and Food Baseline Study* for Douglas County, Colorado. From the executive summary:

This initial phase of the baseline study of food and agriculture specifically addresses and documents the potential economic value and potential job creation opportunity available by localization over time. It demonstrates that by optimizing land and water resources a considerable number of jobs may be created and sets measurable goals toward that end. (Agriburbia, 2011:1)

Agriburbia estimated (Figure 5.2) that approximately 14,800 new jobs could be created in Douglas County using intensive, organic, and metabolic farming methods. The

study also demonstrated that capitalized intensive farming can yield \$50,000 in food and between 0.5 to 2 full time jobs per acre.<sup>39</sup>

	Statistic	Study Note/Assumption	Study Stat
Calories	<p>Recommended<sup>8</sup> (not actual): Daily calorie intake is based on gender, age, height, and activity level. Average range for all ages and height by from sedentary to active:</p> <p>Child (2-3yrs): 1000 - 1400 calories/day  Female: 1200 - 2400 calories/day  Male: 1400 - 3200 calories/day</p> <p>Actual: Daily calorie intake per day has grown from 2,234 calories per person per day in 1970 to 2,757 calories in 2003.<sup>8</sup> Other estimates claim actual intake/day in 2003 equaled 3770 calories<sup>9</sup></p>	2010/2011 breakdown and location of population by gender, age, and activity level is unknown. An average per capita figure is used even though actual estimated calorie intake may be 25 to 50% higher.	<p><b>2000 calorie per capita per day</b>  Based on 2009 population level (291,148), total annual recommended calories = <b>212.5 billion calories annually</b></p>
\$\$\$ Spent on Food	<p>"In-home" food costs"  Low-Plan: \$177/person/mos; \$2,124/year<sup>10</sup>  Liberal-Plan: \$303/person/mos; \$3,636/year<sup>8</sup></p> <p>"Eating Out"  For every dollar spent on food, 53% is food at home, 47% is eating out<sup>8</sup></p>	Though most County residents would likely fall under the liberal plan, the low-plan is used to stay constant with assumed calorie consumption (2000/d.) Tracking in-home only. Formula restated on page 7.	<p><b>\$2,124 / year</b>  Based on 2009 population, total annual expenditure per person=  <b>\$618,398,352 annually</b></p>
Food Value	Well capitalized intensive farming can gross retail, \$1.00 to \$2.00+ per square foot <sup>11, 12, 13</sup>	Assume capitalized and drip irrigated farms. Lower end of range used	<p><b>\$1.15 / square foot</b>  <b>\$50,000/ acre</b></p>
Jobs	Estimates range between .5 to 2 full time jobs per acre for intensive, organic and/or natural farming. <sup>13</sup>	Lower estimate used. Additional labor is needed during harvest, etc.	<b>.5 job / 1 acre</b>

<sup>8</sup> United States Department of Agriculture

<sup>9</sup> United Nations Food and Agriculture Organization (FAO)  
[http://www.fao.org/statistics/yearbook/vol\\_1\\_2/pdf/United-States-of-America.pdf](http://www.fao.org/statistics/yearbook/vol_1_2/pdf/United-States-of-America.pdf)

<sup>10</sup> United States Department of Labor Statistics 2011

<sup>11</sup> Macher, Ron, *Making Your Small Farm Profitable* (Storey Publishing 1999)

<sup>12</sup> Newcomb, Duane, *Small Space, Big Harvest* (Rodale Press 1993)

<sup>13</sup> Wiswall, Richard, *The Organic Farmer's Business Handbook: A Complete Guide to Managing Finances, Crops, and Staff—and Making a Profit* (Chelsea Green 2009)

Figure 5.2: Statistics and assumptions for measuring potential food value and agricultural job creation in Douglas County, Colorado (Agriburbia, 2011:6).

Agriburbia's Community Food Fraction<sup>40</sup> (CFF) process was used in the Douglas County study (Figure 5.3 ). The CFF process allows for a statistical and visual understanding

<sup>39</sup> My interview with an Agriburbia employee revealed that as of August, 2011, they were currently employing labor for TSR Agristruction at a rate of approximately 1 person per acre.

of how many calories are needed and where. The figure below (Figure 5.4) illustrates the fraction based on zip code boundaries. The overall CFF was estimated (preliminarily) at 0.89%, demonstrating an extremely low fraction in a County where several thousand acres of land are currently productive yet not feeding the local population. The study also showed potential for \$875 million to be captured within the County as well as putting 11,000 acres of land into production, serving 40% of the population over the next 20 years. Questions for the “next steps” section of the process are “where will that land be, what resources are needed, and how can the County promote and facilitate local production growth?” (2011:16). Although the use of GIS and the CFF for food systems planning show much potential in the Douglas County study, Agriburbia

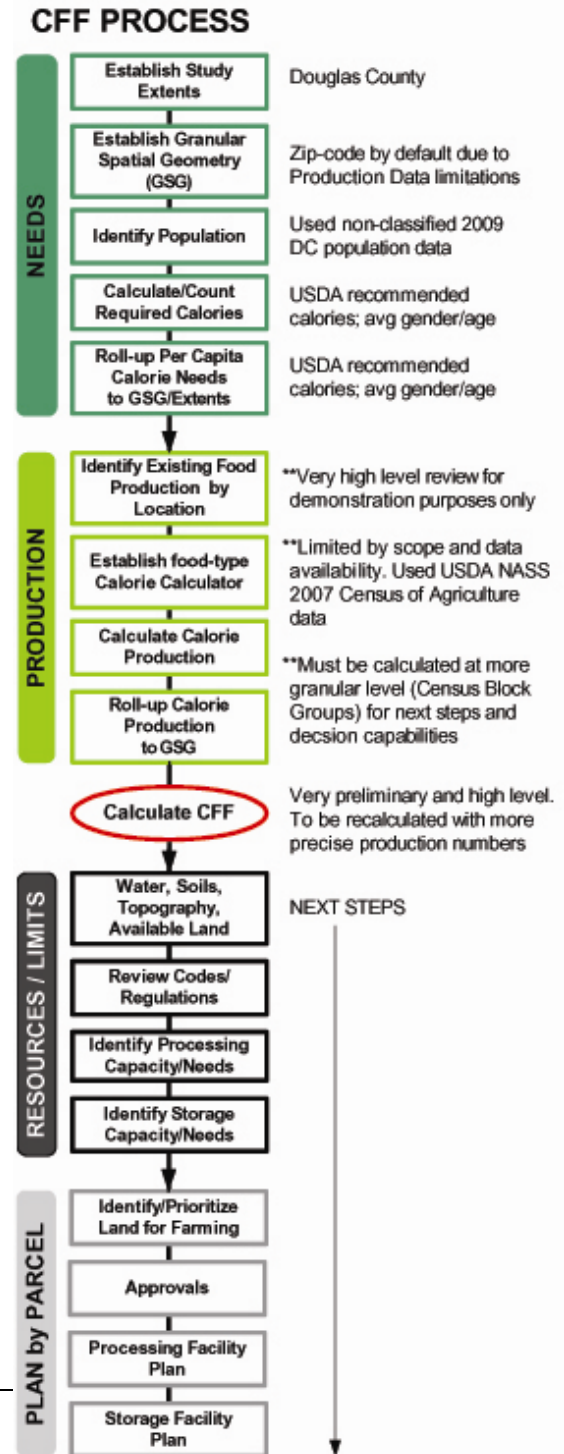


Figure 5.3: The CFF Process

<sup>40</sup> A Community Food Fraction is a ratio of calories required and calories produced for a given geographic location. The Community Food Fraction (CFF) and its methodology is a trademark of Agriburbia.

outlined what other goals remain, such as recognizing and agreeing on the importance of a local food economy, finding and using appropriate lands, obtaining support from cities and other stakeholders, visioning and funding, and treating local food like other crucial resources (e.g. water, traffic, public health).

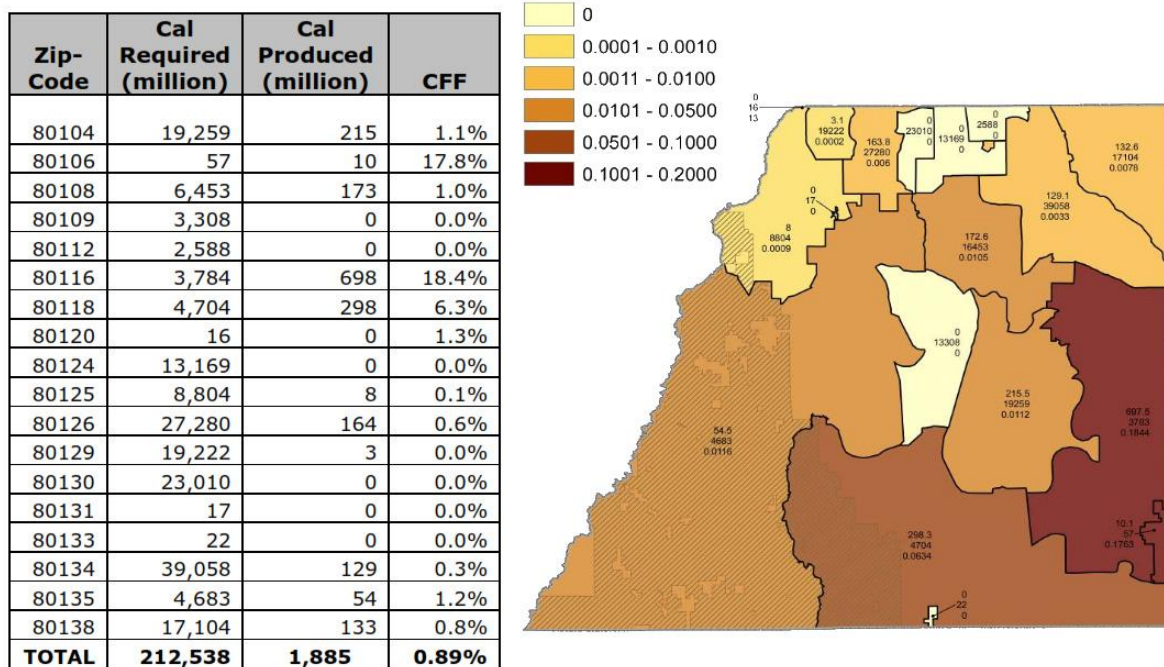


Figure 5.4: Community Food Fraction (CFF) for Douglas County, Colorado. Total Calories Produced / Total Calories Recommended (USDA) 1,885,146,114 / 212,538,000,000 = .89% (Agriburbia, 2011).

Additionally, the perception that only large farms can feed people adequately needs rethinking. For instance (Agriburbia, 2011:24):

- A number of .5 to 10 acre farms will reach the same volume
- Multiple farms support more businesses and create positive competition
- Smaller farms can be managed without large fossil-fuel-consuming equipment
- Smaller and well distributed farms prevent the smell, noise, and traffic typically associated with large production centers

Agriburbia also notes the potential for Douglas County's CFF to be improved 500% by taking advantage of only 3% of residential, vacant, and/or exempt land in four local

communities. Overall, Agriburbia concludes that although the County's (and the nation's) current food system is unsustainable, "capturing jobs and money that typically leaves the County will greatly and positively impact the County's immediate and future economy" (Agriburbia, 2011:25).

#### **5.2.4: UA Land Inventory and Analysis – A Case for the City of Waterloo**

Another potential use of GIS for UA (UAGIS) is the land inventory. Chapter 2 demonstrated how land inventories of vacant parcels have been successful in boosting UA activity in Portland and Vancouver as well as identifying potential UA sites in Oakland, CA (Mendes et al, 2008; McClintock and Cooper, 2010). In this section, I present a similar land inventory, but also incorporate an additional feature by addressing not only vacant lands but also utilizing multi-criteria decision analysis (MCDA) to determine which sites within the City of Waterloo may best support UA.



**Table 5.1: MCDA Chart for the City of Waterloo Analysis**

Multiple Criteria Decision Analysis Chart		
Criteria	Weight*	Rationale/description
By Parcel and its Use		
Vacant Land	1	Potential arable land, but poor land tenure and pressure for other development
Parks/Open Space	4	Contain open tracts of land and generally secure land tenure
Places of Worship	4	Secure land tenure, infrastructure (water), and community support
Schools (Primary, Secondary, University)	5	Secure land tenure, infrastructure (water, processing, storage), staff support, funding potential, food and education for students
Plus the Parcel Location		
Parks/Open Space, Place of Worship, or School within 100m of Multi-family Dwelling	3	Connectivity to garden/farm space for people who may not own land and minimized travel distances
Parks/Open Space within 100m of Rec Center	2	Recreation Center on Park land can contribute a water source, staff support, or other infrastructure
Highest score possible (Park/Open Space within 100m of Multi-family and Rec Center):	9	*Based on weights of 1 to 5
Lowest score possible (vacant land):	1	

\*Based on weights of 1 to 5

The first task in creating this land inventory and analysis was to choose the appropriate and relevant data. Data for this study include Points of Interest from DMTI Spatial (points naming ownership and specific use per parcel, dated 2010) as well as City of Waterloo parcel data from 2007 (polygons outlining parcels by land zoning). The next task was to determine what categories of lands were most appropriate for analysis. Due to the scarcity of vacant land in the City of Waterloo, other land/parcel categories were identified that often contain a higher frequency of permeable and useable UA space. The land categories were determined by this thesis and case study research with the Community Garden Council (CGC) of Waterloo Region, which revealed what lands are most often used for UA locally. These

lands include places of worship (the most commonly used type), schools (primary, secondary, and university), and parks and open space. For this hypothetical study, vacant lands receive a weight (or rank) of “1.” Due to pressure from the municipality and private interest to intensify commercial, residential, and/or industrial uses in these areas; the prospect for urban farms or other types of UA on these lands is unknown and unlikely at present. School parcels were weighted highest due not only to land availability but also due to potential for allocating multiple resources and improvement factors at those sites, such as infrastructure, staff support, and food and education for students.

After identifying land categories based on parcels and their use, they are ranked based on location<sup>41</sup>. For instance, a City park less than 100 meters from the nearest multi-family dwelling is ranked even higher than parks that are further from multi-family dwellings. The rationale for this and other measures are displayed in Table 5.1. See Appendix ‘A’ for the entire Land Inventory and Analysis map and Appendix ‘B’ for a Vacant Land Inventory map.

There are limitations to this Land Inventory and Analysis. One disadvantage is that the data are potentially out of date with current uses or ownership in some places. To remedy this, more recent data would be needed as well as being ‘ground-truthed’<sup>42</sup> for accuracy. Additionally, the best-case scenario would call for conducting focus groups within neighborhoods and/or among key stakeholders as well as conducting surveys to determine what criteria should be included and how best to weight or rank them. The results of the MCDA would then show numbers and ‘scores’ that better reflect the needs and wants of the

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<sup>41</sup> For this section’s Land Inventory and Analysis example, ArcMap was used and weights were totaled using the Field Calculator.

<sup>42</sup> Ground-truthing refers to information that is collected on location.



public or other stakeholders involved in UA planning and implementation (see Figure 5.6 for a conceptual framework of community mapping).

Another potential land inventory or ‘ground-truthing’ tool is CrowdMap (crowdmap.com). CrowdMap (Figure 5.5) is a free, online site designed for ‘crowd sourcing’ information relative to places on a map around a geographic region of your choice.

It is relatively user-friendly, resembling many blogging platforms online today. The developers (Ushahidi) also offer smart-phone applications (iPhone and Android) for access when in-the-field.

Overall, UAGIS for Land Inventory and Analysis is a technique that may

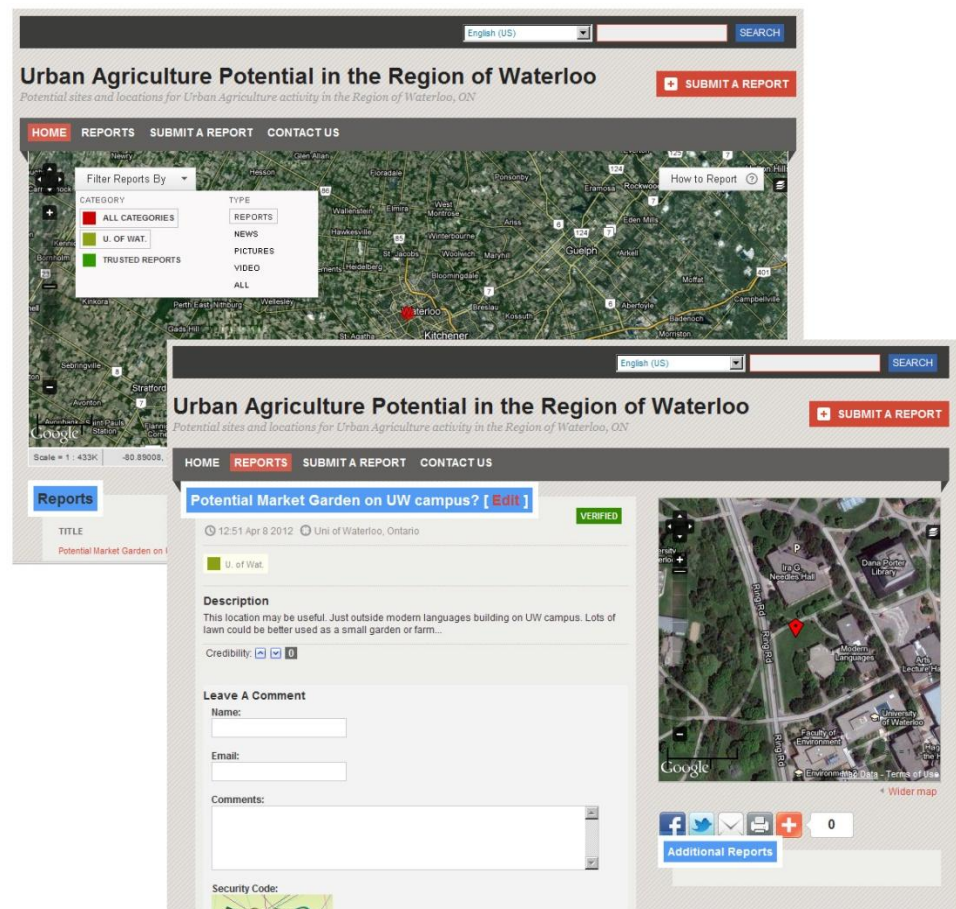


Figure 5.5: Screen-shots of the CrowdMap service (a “deployment” set up by author, as example. <https://urbanagriwaterloo.crowdmap.com>).

require special skill sets still not in the reach of many NGOs or community groups. They typically need people and organizations with these capabilities, such as researchers or planning departments, which can be time consuming and expensive. On the other hand, free and user-friendly online tools such as CrowdMap could prove equally useful and could help municipalities and citizens recognize their UA potential. It is important to note, however, that although land inventories have great potential in enabling UA, their success is also tied to how well they are used alongside other media and outreach strategies (Mendes et al, 2008).

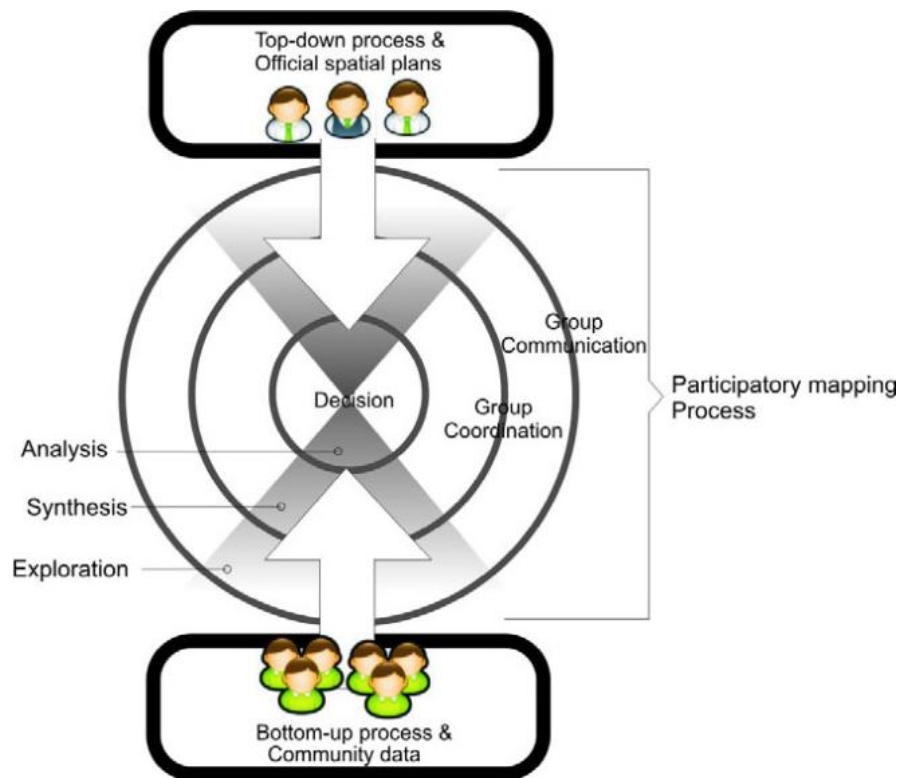


Figure 5.6: Conceptual Framework for the Role of Maps in Community Development Programs (Aditya, 2010).

### 5.3: Recommendations for Future Research

This research focused primarily on the questions of the ‘what’ and ‘how’ variety to determine factors of successful UA implementation and planning in North America.

Throughout the data collecting and interviewing process, four main themes emerged that I suggest warrant further research and discussion:

- Class, ethnicity, and multiculturalism in UA
- The role of aesthetics in UA
- UA typologies
- Comparing UA in North America to UA abroad

First, some interviewees made comments suggesting the role of class and ethnicity in understanding successful UA. This was particularly noted among Waterloo Region participants, where in many instances the importance of multiculturalism was more pronounced relative to discussions of how new Canadians are included and fit in to the community gardening network. Questions for research could include: Why is multiculturalism important in UA/community gardening? What are the implications for new immigrant and/or minority populations where multicultural UA agendas are being promoted? Who benefits, and who loses from these agendas? What role do class, ethnicity, gender, or immigrant status play in understanding UA?

Second, this study’s interview participants as well as authors in the literature cite how UA can contribute to the beautification of urban areas. This theme largely emerged through discussions of successful environmental improvements of UA. Urban planners and designers may find interest in understanding the role of aesthetics in UA, with questions such as why

and/or how do people value agriculturally productive spaces? Are people more likely to find ‘beautiful’ urban farms and gardens more productive? What constitutes ‘beautiful’ UA?

Third, this research demonstrated some disparity between the economics and scale of urban farming (Agriburbia/TSR Agristruction) and community gardening (Patchwork Community Gardens). As typologies, urban farming implies a model based at least partly on the concept of ‘commodity’ farming and therefore a for-profit enterprise. I suggest that although this case study research does not decisively conclude that community gardening is *not* UA, a great deal of literature implies that UA and its types ought to—or at least typically do—demonstrate some degree of measurable economic impact on local economies. But at what scale of economy does community gardening fit in? Are individual economic gains enough, or must UA demonstrate local economic benefits across multiple scales of markets and distribution? At what point does a community garden become a ‘market’ garden or urban farm? Further, what is the difference between (urban) agriculture and (urban) gardening? Is there a consensus on size and function of all these UA typologies, and should there be? Also, should community gardening be considered ‘urban agriculture’ at all, or should it remain as ‘gardening’?

Lastly, the phenomenon of UA across cities of the global south as well as in developing nations is well documented—better documented than that of UA in North America within much of the scholarly research that exists on the topic. This offers opportunities for understanding the connection, if any, between models of UA abroad and those found in Canada and the US. Questions for future research could include: what are the similarities and differences between UA planning and implementation in North America and

abroad? What role do municipal departments play in North America vs. other countries? What role do citizens have in determining how UA functions in cities across other parts of the world, and how does it compare to North American cities? How are the socio-economic and environmental contexts different, and what can we learn?

## **5.4: Conclusion**

This research used multiple case studies to determine what factors contribute to successful planning and implementation of UA in a North American context. Two study groups were chosen: the Patchwork Community Garden with the Community Garden Council in the Region of Waterloo, Ontario; and Agriburbia / TSR Agristruction in the Denver Metro Area of Colorado. These organizations were chosen due to their involvement directly in planning and implementing UA from the ‘bottom up’ as non-government organizations. Calls for multi-disciplinary approaches to UA research (Redwood, 2009) as well as the lack of many municipalities in understanding the role planners play in addressing UA beyond zoning controls (APA, 2011) also contributed to the rationale for this research approach and design. Additionally, only a small but growing body of literature addresses UA in a North American context using multiple case study analysis with participant-observation. My own personal involvement by means of participant-observation and experience in landscape construction, landscape architecture, and land planning offered further insight into understanding UA in these two North American regions. Although much of the existing UA literature discusses benefits and/or barriers to implementing agriculture in urban areas, much less has addressed the question of what factors within specific organizations contribute to successful planning and implementation of UA.

This research has shown that successful UA is tightly linked to building community (quality of life or lifestyle), local-based economics (stretching the food dollar or job creation), and environmental stewardship (urban ecology or resource conservation). Several factors contribute to successful planning and implementation of UA, the most crucial of which are dedicated and enthusiastic individuals and groups of people. In addition, several stakeholders who share common objectives can contribute to UA success from across multiple scales and disciplines. Furthermore, this research shows that successful UA is also linked to how projects demonstrate some discernible socio-economic and environmental improvement within their organizations, local communities, or cities, suggesting that UA—if it is to be successful—should be a socially relevant, economically resilient, and environmentally sound food system. The question of ‘what is successful urban agriculture’ appeared during the course of this research. Based on the findings of this study, I propose that *successful* UA is best defined as the experience of community, stewardship of the environment, and a contribution to local and/or individual economic improvement by means of producing food in and around cities.

The implications of the resurgence of UA in North American cities for planning practice, as well as for non-government organizations, are many. Municipal planners must now look beyond simply permitting or rezoning and understand the greater potential and context of UA across multiple stakeholders and socio-economic and environmental dimensions. Researchers, grass-roots organizations, private planners and designers, entrepreneurs, and other NGOs have led the charge of (re)creating UA in North America. Municipalities and others would do well to learn from these successes ‘on the ground.’

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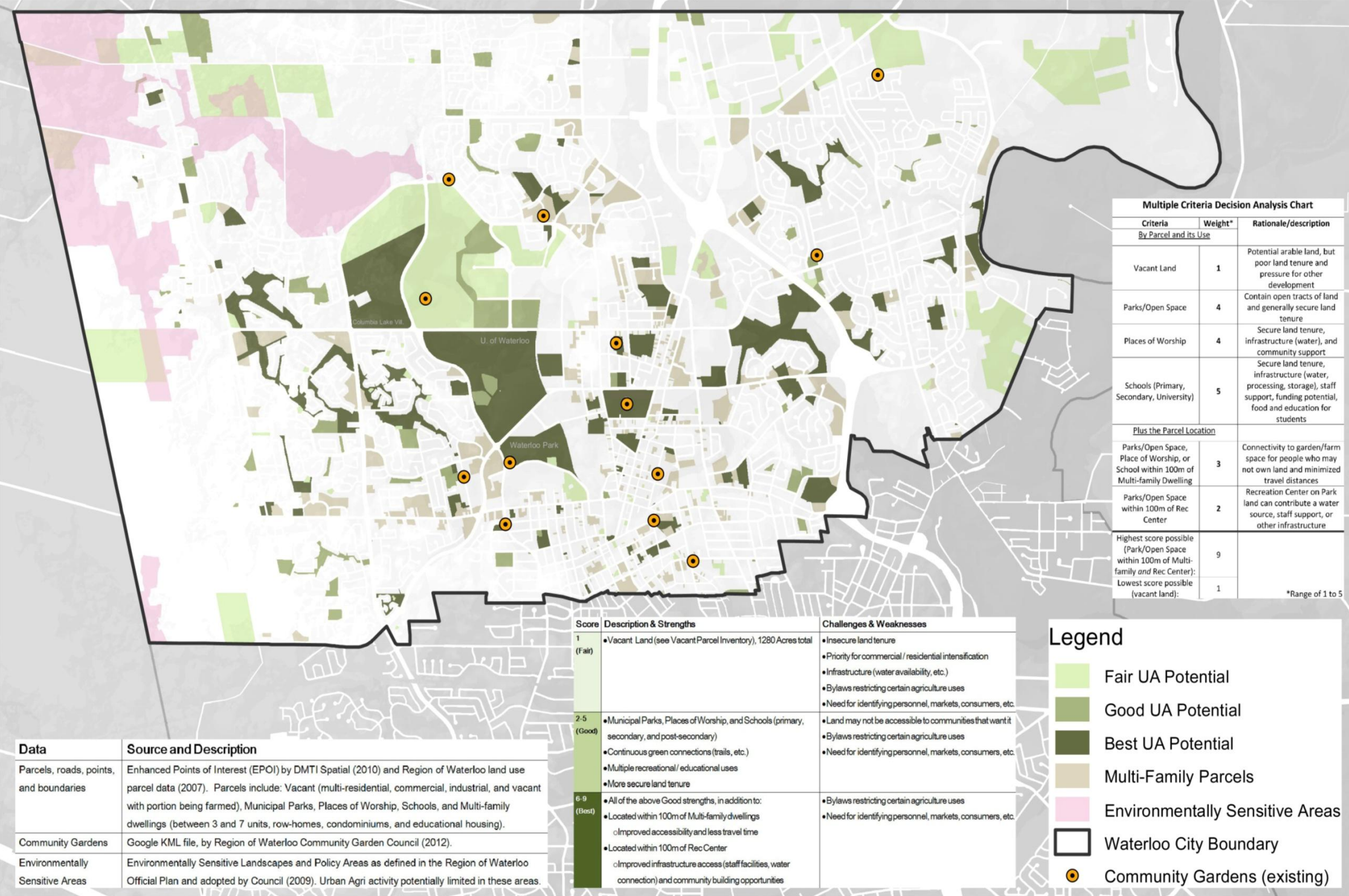
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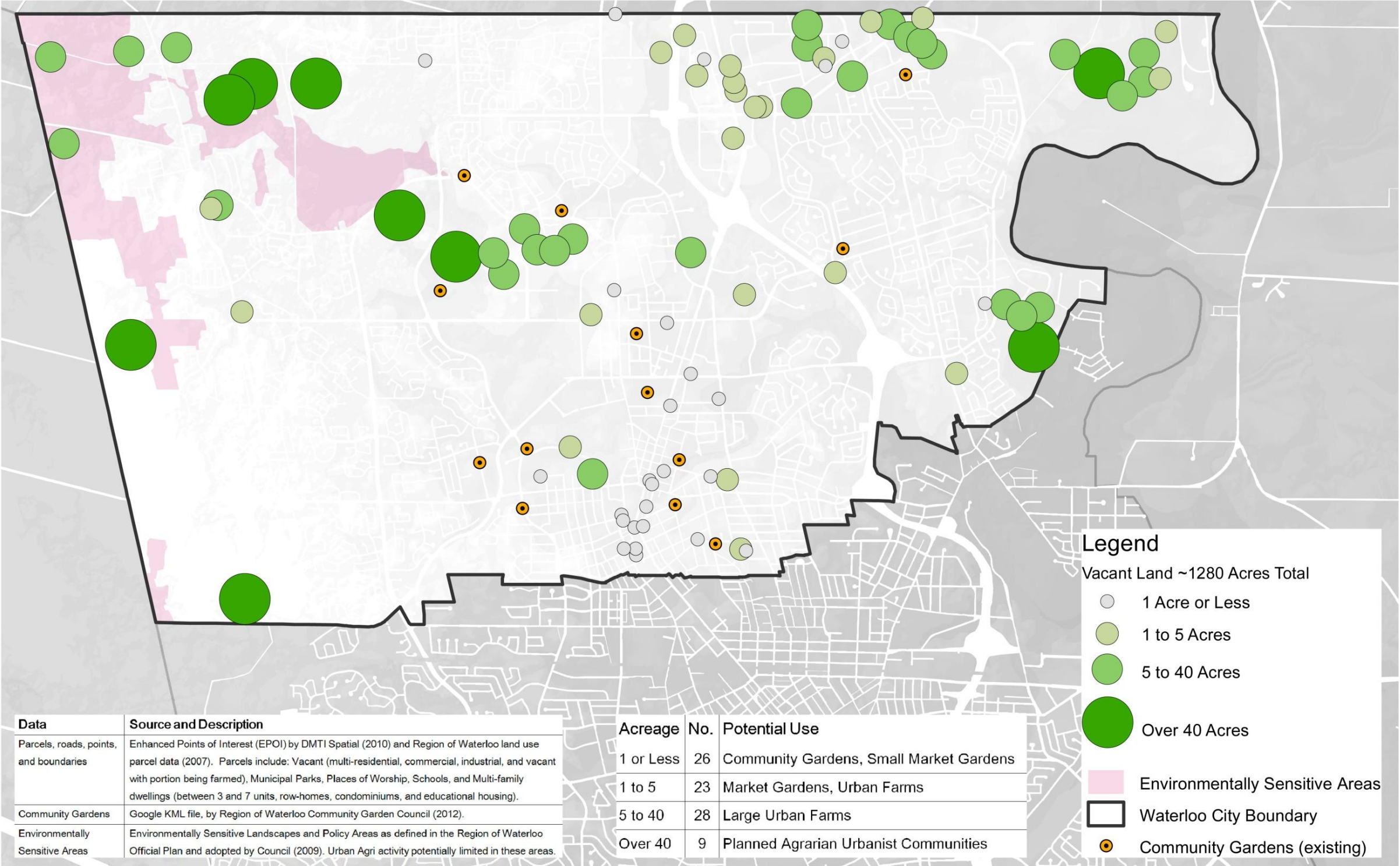
APPENDIX A: Land Inventory and Analysis Prototype



Land Inventory and Analysis: Urban Agriculture Potential  
City of Waterloo, Ontario



APPENDIX B: Vacant Land Inventory Prototype



Vacant Land Inventory: Urban Agriculture Potential  
City of Waterloo, Ontario

## APPENDIX C: Study Areas – Key Statistics

This Appendix provides further statistical background information of each region within which the case studies are located. A focus is given to climate, population and employment, farmland, and UA activity within each area.

### *The Regional Municipality of Waterloo, Ontario, Canada*

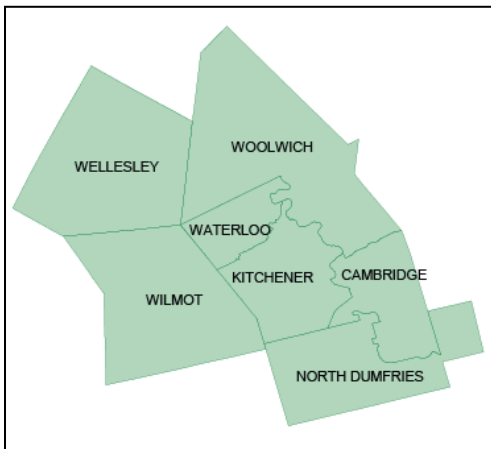
- The Region of Waterloo is defined as an area comprised of three cities (Waterloo, Kitchener, and Cambridge) and four townships (Woolwich, Wellesley, Wilmot, and North Dumfries) in Southern Ontario, Canada.
- The Region's total land area is 529 square miles (1,369 square kilometers), has a median age of 36, and had a median household income of \$76,408 in 2006<sup>43</sup> (Region of Waterloo Public Health, 2010).
- The 2011 population was 507,096, demonstrating a 6.1% growth rate since 2006—slightly higher than the 5.7% growth rate for the Province of Ontario from 2006 to 2011 (Statistics Canada, 2012).
- The five most common employment sectors are manufacturing, retail trade, health care and social assistance, educational services, and construction (Region of Waterloo Public Health, 2010).
- Approximately two-thirds (354 square miles) of the Region of Waterloo is farm land with an average farm size of 157 acres (Region of Waterloo Public Health, 2010).
- The Region is largely within USDA Hardiness Zone 5b (average annual extreme low temperature of -15F to -10F [-26C to -23C]).<sup>44</sup>

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<sup>43</sup> Equivalent to approximately \$86,341 USD considering a CAD-USD exchange rate of 1.13 in 2006. See <http://www.x-rates.com/d/CAD/USD/hist2006.html>

<sup>44</sup> From the Natural Resources Canada website. See: <http://tinyurl.com/7red5uq>





*Top Left: The Province of Ontario in Canada ([http://en.wikipedia.org/wiki/File:Ontario,\\_Canada.svg](http://en.wikipedia.org/wiki/File:Ontario,_Canada.svg)). Top Right: The Region of Waterloo in Ontario ([http://en.wikipedia.org/wiki/File:Map\\_of\\_Ontario\\_WATERLOO.svg](http://en.wikipedia.org/wiki/File:Map_of_Ontario_WATERLOO.svg)). Bottom Left: The Cities and Townships of Waterloo Region ([http://www.dmg.utoronto.ca/images/tts/2006/regional\\_travel\\_summaries/waterloo.png](http://www.dmg.utoronto.ca/images/tts/2006/regional_travel_summaries/waterloo.png)).*

- UA activity is present in the Region of Waterloo, largely in the form of community gardens. Currently, there are:
  - 43 community gardens<sup>45</sup>.
  - 8 community- and/or neighborhood-supported agriculture (CSA/NSA) operations<sup>46</sup>.
  - 5 farmers' markets<sup>47</sup>.

Zoning regulation for agriculture in the Region of Waterloo is mostly relative to the rural areas. Agricultural uses (apart from community gardens) such as commercial farming and raising livestock are generally not permitted in the Region's urban areas at time of this writing. Some exceptions exist where residents were 'grandfathered in' once bylaws were created to clearly forbid the keeping of certain animals (e.g. chickens, ducks) for food production and/or as

<sup>45</sup> See <http://www.together4health.ca/workgroups/community-gardens/new-child-page-0>.

<sup>46</sup> See <http://csafarms.ca/farms%20counties%20S-Z.htm#waterloo>.

<sup>47</sup> See <http://farmersmarketsontario.com/> and <http://greenbeltfresh.ca/farmers-market-list>. These numbers do not account for small road-side and farm stands that may appear seasonally throughout the Region.

pets. Like most of North America, keeping a ‘kitchen garden’ or backyard garden—typically non-commercial, maintained on one’s own residential lot, and consisting of fruits and vegetables—is generally allowed throughout the Region. Community gardens are encouraged and supported by the Region of Waterloo’s Official Plan (2011/12 Draft – Chapter 3) and typically defined as non-profit.

### *The Denver Metropolitan Area, Denver, Colorado*

- The Denver Metropolitan Area (Denver Metro) is defined as a region in the central portion of the State of Colorado, USA, comprised of 10 counties<sup>48</sup>.
- The population of Denver Metro in 2010 was 2,784,228.
- Population growth in the metro area has steadily increased approximately 1.5% over the past decade, surpassing the average US growth rate of just less than 1% (Metro Denver Economic Development Corporation, 2012).
- The most populous portion of the metro area, as well as the State of Colorado, is the combined City and County of Denver: population of 600,158 (2010 census, US Census Bureau).
- The Denver Metro is approximately 8,414 square miles (21,794 square kilometers), has a median age of 36, and had a median household income of \$59,007 in 2009.
- The five most common employment sectors are professional and business, wholesale and retail trade, government, education and health, and leisure and hospitality (Metro Denver Economic Development Corporation, 2012).
- Approximately half (4,260 square miles) of the Denver Metro is farm land with an average farm size of 473 acres (USDA, 2007).
- The Denver Metro is largely within USDA Hardiness Zone 5b (average annual extreme low temperature of -15F to -10F [-26C to -23C]) (USDA, 2012).
- UA activity is present throughout the Denver Metro. Currently, there are:
  - **115 community gardens** in the Denver Urban Gardens (DUG) network, 83 of which are located in Denver<sup>49</sup>.
  - **46 community- and/or neighborhood-supported agriculture (CSA/NSA)** operations<sup>50</sup> within 60 miles of Denver<sup>51</sup>.
  - **27 farmers’ markets** (Colorado Department of Agriculture, 2011), 15 of which are in Denver (Goldstein et al, 2011).

Zoning laws regarding agricultural uses within urban areas vary across the metro area.

The City and County of Denver has made strides to be more supportive of UA in recent years

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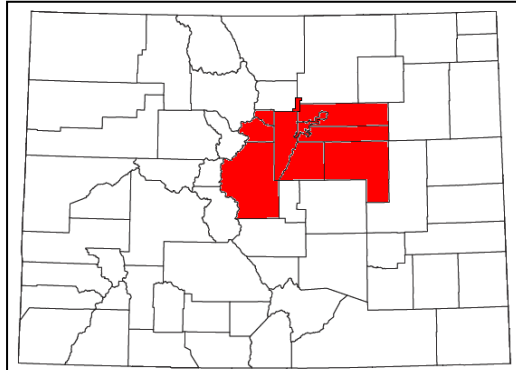
<sup>48</sup> Also known as the Denver-Aurora-Broomfield Metropolitan Statistical Area by the US Department of Labor and the US Census Bureau.

<sup>49</sup> See <http://dug.org/garden-list>.

<sup>50</sup> Neighborhood Supported Agriculture (NSA) is a super-local version of a CSA (Community Supported Agriculture) ([http://eatwhereulive.com/?page\\_id=58](http://eatwhereulive.com/?page_id=58)).

<sup>51</sup> See <http://www.ecovian.com/denver>.

by adopting new codes in 2010 that allow urban farming and community gardening on both public and private property (Goldstein et al, 2011). Additionally, Denver City Council passed a Food Producing Animal ordinance in 2011 which “allows for up to 8 chickens (no roosters) or ducks (no drakes) (or any combination of such fowl), plus 2 dwarf goats to be raised on a property” with a restricted livestock or fowl license (City and County of Denver, 2011:1).



*Top Left: The State of Colorado in the USA (<http://en.wikipedia.org/wiki/Colorado>). Top Right: The Denver-Aurora-Broomfield Metropolitan Statistical Area ([http://en.wikipedia.org/wiki/File:Denver-Aurora\\_Metropolitan\\_Area.png](http://en.wikipedia.org/wiki/File:Denver-Aurora_Metropolitan_Area.png)). Bottom Left: City and County of Denver in the State of Colorado (<http://en.wikipedia.org/wiki/Denver>).*

## **APPENDIX D: Denver Zoning Code Relative to UA**

(Taken from Denver Zoning Code, June 2010 version)

### **Section 11.10.9 GARDEN**

#### **11.10.9.1 All Zone Districts**

In all Zone Districts, where accessory garden uses are permitted with limitations:

- A. Bee keeping is allowed as incidental to the accessory Garden use, subject to compliance with the standards for accessory bee-keeping stated in Section 11.8.6, Keeping of Household Animals, except that the bee keeping use need not be sited within the rear 50% of the zone lot, and except that in an Industrial Context Zone District or Open Space Context Zone District, the number of permitted bee hives may be increased to a maximum of 2 hives per 6,000 square feet of gross zone lot area.
- B. In a Residential Zone District, retail or wholesale sales of goods or products derived from a Garden are allowed when such use is accessory to a primary nonresidential use, including but not limited to a permitted Public, Institutional and Civic Use. In all other Zone Districts, retail or wholesale sales of goods or products derived from a Garden are allowed when such use is accessory to a primary nonresidential use.

### **Section 11.10.10 KEEPING OF ANIMALS**

#### **11.10.10.1 All Zone Districts**

In all Zone Districts, where accessory keeping of animals is allowed with limitations:

##### **A. Animals Allowed Without a Zoning Permit**

Keeping of no more than 8 chickens and ducks combined per zone lot, and no more than 2 Dwarf Goats, except any number of their offspring younger than 6 months, per zone lot may be kept, provided:

- 1. No structure used to house the animals may be closer than 15 feet to: (1) a structure on an abutting zone lot containing a dwelling unit, and (2) a dwelling unit not the residence of the animal keeper(s) and located in a primary structure on the same zone lot; and
- 2. Slaughtering of the animals as part of keeping such animals is prohibited.

##### **B. Animals Allowed With a Zoning Permit**

The Zoning Administrator may allow the accessory keeping of animals of a type or number other than allowed in Section 11.10.10.1.A above, upon finding that the use complies with Section 11.7.1, General Provisions Applicable to All Accessory Uses, and subject to the following additional limitations:

- 1. Section 12.4.2, Zoning Permit Review with Informational Notice, is required when the subject property is in a:

- a. Residential Zone District;
  - b. MS-2x and MX-2x Zone District; or
  - c. Mixed Use Commercial Zone District where the subject property is adjacent to a Residential Zone District.
2. For all other requests, Section 12.4.1, Zoning Permit Review, is required.
  3. The Zoning Administrator may not approve the keeping of animals otherwise prohibited by federal, state, or other city law;
  4. No structure used to house the animals may be closer than 15 feet to: (1) a structure on an abutting zone lot containing a dwelling unit, and (2) a dwelling unit not the residence of the animal keeper(s) and located in a primary structure on the same zone lot; and
  5. Slaughtering of the animals as part of keeping such animals is prohibited.

## **Section 11.12.6 PRIMARY AGRICULTURE USES**

### **A. Definition of Agriculture Use Category**

Agriculture Use Category includes cultivation, production, keeping, or maintenance for personal use, donation, sale or lease, of: (1) plants, including but not limited to: forages and sod crops; grains and seed crops; fruits and vegetables; herbs; and ornamental plants; and (2) livestock, including but not limited to: dairy animals and dairy products; poultry and poultry products; cattle and cattle products; or horses.

### **B. Specific Agriculture Use Types and Definitions**

#### **1. Aquaculture**

An agricultural use in which food fish, shellfish or other marine foods, aquatic plants, or aquatic animals are cultured or grown in order to sell them or the products they produce. Includes fish hatcheries, growing tanks or raceways; the processing, storage, packaging and distribution of shellfish and fish; and accessory uses such as feed storage and water treatment facilities.

#### **2. Garden, Urban**

Land that is (1) managed by a public or nonprofit organization, or by one or more private persons, and (2) used to grow and harvest plants for donation, for personal use consumption, or for off-site sales by those managing or cultivating the land and their households.

#### **3. Husbandry, Animal**

The cultivation, production, and management of animals and/or by-products thereof, including, but not limited to grazing of livestock and production of meat, fur, or eggs; excluding, however, feed lots (see definition below), hog farms, dairies, poultry and egg production facilities, bee-keeping and apiaries, horse boarding, and riding stables.

##### **a. Feed Lot**

A feed lot shall be determined to be any of the following facilities:

- i. Any tract of land or structure wherein any type of fowl or the by-products thereof are raised for sale at wholesale or retail; or
- ii. Any structure, pen or corral wherein cattle, horses, sheep, goats and swine are maintained in close quarters for the purpose of fattening such livestock before final shipment to market; or
- iii. The raising of swine under any conditions.

#### **4. Husbandry, Plant**

An agricultural use, other than a Plant Nursery, in which plants are cultivated or grown for the sale of such plants or their products, or for their use in any other business, research, or commerce; excluding, however, forestry and logging uses.

#### **5. Plant Nursery**

An agricultural use in which plants are grown, cultivated, produced, or managed for the on-site or off-site sale of such plants or their products, or for their use in any other business, research, or commerce. Other customarily incidental products may be sold with the plants. A Plant Nursery may include accessory Aquaculture use, when the Aquaculture is integral to the growing and maintenance of the plants, and provided the accessory Aquaculture occurs within a completely enclosed structure.

Examples of Plant Nursery uses include, but are not limited to: wholesale or retail plant nurseries with greenhouses or garden stores; retail nurseries where plant inventory and related plant products are sold, but which may not be grown or produced on-site; tree farms; vineyards and orchards; flower farms; field nurseries; and sod farms. Plant Nursery uses do not include forestry or logging uses, or the keeping of animals or livestock except where expressly allowed as an accessory use.

## APPENDIX E: Interview Questionnaire

This interview is targeted toward planners, designers (such as landscape architects), and organizations—primarily private sector—involved in the advocacy, planning, and/or design for urban agriculture, primarily in the Waterloo Region and the Denver Metro Region of Colorado, USA. These are open-ended questions. In this document, ‘UA’ refers to ‘urban agriculture.’

### 1) Introductions

- a. Thank you for taking the time to let me interview you. Remember, you are not obliged to answer any or all questions you do not wish to answer.
- b. What is your position and for how many years have you worked with \_\_\_\_\_?
- c. Have you worked in other fields/industries before coming to \_\_\_\_\_?
- d. How long have you been involved in  
(planning/designing/implementing/strategizing) UA  
(organizations/projects/plans/guidelines)?

### 2) Organizational roles and the UA Planning/Design/Implementation process

- a. How did your organization become involved in the project(s)?
- b. What was your organization’s role in the project(s)?
  - i. Were you contracted for this work, was it *pro bono*, were you the project lead, or some other role?
  - ii. What was your own role, specifically?
- c. What were the first steps taken in the planning/design/implementation of the project(s)?
- d. How were key stakeholders identified for the project(s) in which you were/are involved?
  - i. What role did the local citizen base have in determining the outcome of the UA project(s)?
  - ii. What role did any governmental agency play in determining the outcome?
  - iii. (If applicable) Were each of these agency’s involvements mostly enabling or mostly detrimental toward helping your organization achieve the goals of the project(s)?
- e. What precedents, if any, were referenced or studied when preparing UA planning/design/implementation strategies for your project(s)?
  - i. How did your organization determine what precedents were applicable to your project(s)?
- f. What were the major obstacles (if any) in implementing the proposed UA guidelines or plans?
  - i. What factors most hindered the success of achieving the goals of the project(s)?
  - ii. Were any of these obstacles overcome? Why or why not?
- g. What factors most contributed to successful planning and/or implementation of the project(s)?

### 3) Reflections

- a. Of the various stakeholders involved, which group or individual was most helpful toward making the project(s) a success?
- b. How do these projects demonstrate success in terms of local socio-economic improvements?
  - i. Any negative results (both during the process and as a result of implementation)?
- c. How do these projects demonstrate success in terms of local environmental improvements?
  - i. Any negative results (both during the process and as a result of implementation)?
- d. How would you do things (or, how are you doing things) differently in light of your experience with the project(s)?
  - i. If you are not doing things differently, why not?
- e. How important is the project(s) to each of the stakeholder(s) you worked with (or, how much do you feel each group cared about the project, and why?)
- f. What would you say is your greatest success being involved in urban agriculture?



## APPENDIX F: Web Survey Questions (with results shown)

This survey is for individuals and organizations involved in the advocacy, planning, and/or design for urban agriculture.

For this survey, the term “urban agriculture” is abbreviated “UA,” and is defined as *the practice of cultivating, processing and distributing food in, or around a village, town, or city*. The term “organization” means the company or group with which you are most often involved that works toward planning or implementing UA projects.

Please check the best answer for each question. You are allowed one (1) answer per question. You may respond to as many or as few questions as you wish.

(Note: Only the 11 participants who were personally interviewed were asked to take the survey. 6 of 11 responded, and of those 6, all completed the multiple-choice and 5 completed the ranking questions. Only 3 typed responses were given for the final open-ended question. Results are tallied below, showing response count adjacent to percent of total responses per question.)

4) Your organization is best described as

- |                |                                     |
|----------------|-------------------------------------|
| 0              | Governmental                        |
| <b>2 (33%)</b> | <b>Private business</b>             |
| <b>2 (33%)</b> | <b>Community or volunteer group</b> |
| <b>2 (33%)</b> | <b>Non-profit, charitable</b>       |

5) How is your organization most often involved in UA projects?

- |                |   |
|----------------|---|
| 2 (33%)        | Volunteering                                  |
| 1 (16.7%)      | Consulting, planning & design, and/or farming |
| <b>3 (50%)</b> | <b>Advocacy and/or community outreach</b>     |
| 0              | Other   |

6) The main reason I’m involved in UA is because

- |                |   |
|----------------|---|
| 0              | It’s a cheap alternative to store-bought produce.                     |
| 0              | It’s how I make a living (sale of produce, consulting business, etc.) |
| 2 (33%)        | It’s a way to enjoy healthy, tasteful food.                           |
| 0              | It offsets damages to the environment from industrial food processes. |
| <b>4 (66%)</b> | <b>It contributes to building community and/or social justice.</b>    |
| 0              | It’s an enjoyable hobby.  |

7) Typically, successful UA activities must include

- |                |   |
|----------------|---|
| a.             | Expert guidance on group organization and outlining key objectives and goals. |
| 0              | Strongly Agree  |
| <b>3 (60%)</b> | <b>Agree</b>  |
| 1 (20%)        | Neutral   |
| 0              | Disagree  |

- 1 (20%) Strongly Disagree
- b. Professional site design and layout.
- 0 Strongly Agree
- 3 (60%) Agree**
- 0 Neutral
- 1(20%) Disagree
- 1(20%) Strongly Disagree
- c. Expert guidance for understanding local bylaws and zoning codes.
- 0 Strongly Agree
- 4(80%) Agree**
- 0 Neutral
- 0 Disagree
- 1(20%) Strongly Disagree
- d. **People actively gardening/farming the land.**
- 4(80%) Strongly Agree**
- 1(20%) Agree
- 0 Neutral
- 0 Disagree
- 0 Strongly Disagree
- 8) The best UA activities have succeeded with little or no input from local, state, provincial, or federal governments.
- 0 Strongly Agree
- 0 Agree
- 4 (80%) Neutral**
- 1 (20%) Disagree
- 0 Strongly Disagree
- 9) Regional and Urban/City Planners should do more to enable UA.
- 4 (80%) Strongly Agree**
- 1 (20%) Agree
- 0 Neutral
- 0 Disagree
- 0 Strongly Disagree
- 10) Based on your experiences, please rank the following people or groups involved in UA, in order from Helpful but Least Crucial (1) to Most Helpful and/or Essential (6).
- | Avg. Score  | Category:  | Response Count |
|-------------|--|----------------|
| 2.67        | Community groups and/or volunteers                     | 3              |
| 3.20        | Municipal governments (local, regional, federal, etc.) | 5              |
| 3.67        | A strong leader with a clear vision                    | 3              |
| 4.00        | Non-profit institutions (schools, churches, etc.)      | 3              |
| <b>4.25</b> | <b>Funding institutions and/or banks</b>               | 3              |
| <b>4.25</b> | <b>Private business(es)</b>                            | 4              |
- 11) Essentially, successful UA is best defined as (50 words or less):

3 responses total:

- *Urban agriculture produces delicious, healthy, safe food that is available to everyone and is an integral part of the landscape and community that it resides in. By enabling people to play an active role in their health, it is a rewarding alternative to industrially produced food and consumption-centric recreation.*
- *UA is the sustainable production of and interaction with the food crops that sustain us. Ideally UA does not recreate an industrial system but instead encourages participation and cooperation from diverse stakeholders within our communities.*
- *Macro, meso, and micro commitment to simple living and eating.*

## APPENDIX G: Overall Case Comparison of Factors (in detail)

Patchwork Community Gardens		Agriburbia / TSR Agristruction	
Category	Characteristics and/or examples	Category	Characteristics and/or examples
<b>Organizational structure</b>		<b>Organizational structure</b>	
Grassroots	<ul style="list-style-type: none"> <li>Charitable</li> <li>Volunteer, 'non-expert'</li> <li>Defined as: "local political organizations which seek to influence conditions not related to the working situation of the participants and which have the activity of the participants as their primary resource"</li> </ul> Gundelach (1979:187)	Non-government business	<ul style="list-style-type: none"> <li>For-profit</li> <li>Provides employment security, recruits and/or trains a skilled workforce, and/or displays managerial characteristics such as "high commitment, high performance, high involvement, and so forth" (Pfeffer, 1998:96).</li> </ul>
<b>Stakeholders</b>		<b>Stakeholders/clients</b>	
Key individuals	<ul style="list-style-type: none"> <li>Members and volunteers within the PCG</li> <li>Key members of the organizations (below):</li> </ul>	Anyone with a use for the produce	<ul style="list-style-type: none"> <li>Private landowners/ developers who understand the value</li> <li>Denver Public Schools</li> </ul>
Community groups, charities, and grassroots organizations	<ul style="list-style-type: none"> <li>'The Branches'</li> <li>The African Community Wellness Initiative (ACWI)</li> <li>Community Garden Council (CGC)</li> <li>K-W Multicultural Centre</li> </ul>	Restaurants and food preparers	<ul style="list-style-type: none"> <li>Denver restaurants showcasing local food</li> </ul>
Funding institutions	<ul style="list-style-type: none"> <li>TD Bank (Friends of the Environment Fund)</li> </ul>	Non-profits	<ul style="list-style-type: none"> <li>Advocate policies/programs for healthy living, healthy eating</li> </ul>
Other Institutions	<ul style="list-style-type: none"> <li>Region of Waterloo Public Health</li> <li>Wilfrid Laurier University</li> </ul>	Municipal government	<ul style="list-style-type: none"> <li>Zoning code permitting UA uses (e.g. Denver "urban garden" use)</li> <li>Flexible zoning districts allow sub-division planning around UA</li> </ul>
Municipal government	<ul style="list-style-type: none"> <li>Region and City of Waterloo (policy to encourage and support community gardens)</li> </ul>		
<b>Resource Factors</b>		<b>Resource Factors</b>	
<u>Human Resources:</u>		<u>Human Resources:</u>	
People (individuals and groups)	<ul style="list-style-type: none"> <li>Commitment</li> <li>Passionate, gives fire to keep going</li> </ul>	People (internal and external)	<ul style="list-style-type: none"> <li>Smart clients who see the value of Agriburbia model (external)</li> </ul>
	<ul style="list-style-type: none"> <li>Went above and beyond, donate time and energy</li> <li>Provide continuity, some infrastructure, some material needs, connections, private or public sector</li> </ul>		<ul style="list-style-type: none"> <li>Willing, reliable, knowledgeable workforce (internal)</li> </ul>

Financial Resources:		Financial Resources:	
Start-up funding	<ul style="list-style-type: none"><li>Grant money, for materials purchases to start the gardens</li></ul>	Profit	<ul style="list-style-type: none"><li>Economic and market viability and job creation (e.g. DP Schools hire Agriburbia, purchase produce)</li></ul>
On-going funding	<ul style="list-style-type: none"><li>Annual member fee, used for long-term needs</li></ul>		
Natural Resources:		Natural Resources:	
Land and water	<ul style="list-style-type: none"><li>Preferably secure tenure and close to neighborhoods they serve</li></ul>	Land and water	<ul style="list-style-type: none"><li>Private, public, or other institutionally-owned land</li></ul>
Political Resources:		Political Resources:	
Advocacy	<ul style="list-style-type: none"><li>Organizations and/or politicians promote gardens</li></ul>	Advocacy	<ul style="list-style-type: none"><li>Organizations promoting agendas boosting UA objectives</li></ul>
Policies and/or bylaws	<ul style="list-style-type: none"><li>Municipal policies to aid citizens in creating community gardens</li></ul>	Zoning and land use regulation	<ul style="list-style-type: none"><li>Zoning and land use categories which allow UA uses</li></ul>
Technical Resources:		Technical Resources:	
n/a		Professional software	<ul style="list-style-type: none"><li>Aid in the planning, design, and maintenance of Agriburbia projects</li></ul>
Improvement Factors		Improvement Factors	
Social: ➤ Quality of life	<ul style="list-style-type: none"><li>Community-building (meeting people, especially for ‘newcomers’)</li><li>Personal well-being (health, happiness, stress relief)</li><li>Decreased crime</li></ul>	Social: ➤ Lifestyle	<ul style="list-style-type: none"><li>Education</li><li>Resourcefulness</li><li>Community</li></ul>
Economic: ➤ Quality food for less cost	<ul style="list-style-type: none"><li>Stretching the ‘food dollar’</li></ul>	Economic: ➤ Local economic development	<ul style="list-style-type: none"><li>Job creation</li><li>Purchase of goods at community or neighborhood levels</li></ul>
Environmental: ➤ Ecology ➤ Aesthetics	<ul style="list-style-type: none"><li>Local food (decreased food miles)</li><li>No use of chemicals</li><li>Less use of water</li><li>Less use of fossil fuels</li><li>Composting</li><li>Urban biodiversity</li><li>Garden space, not maintenance of lawn</li><li>Beautification</li></ul>	Environmental: ➤ Resource conservation	<ul style="list-style-type: none"><li>No use of chemicals</li><li>Less use of water</li><li>Less use of fossil fuels (e.g. Metabolic Distance)</li></ul>
Inhibiting/negative Factors		Inhibiting/negative Factors	
Social: ➤ Lack of understanding or respect	<ul style="list-style-type: none"><li>NIMBYism</li><li>Vandalism</li></ul>	Social: ➤ Lack of understanding or skill	<ul style="list-style-type: none"><li>Expectation of value</li><li>Food illiteracy</li><li>NIMBYism</li><li>Locating skilled labor</li></ul>
Economic: ➤ Obtaining funding	<ul style="list-style-type: none"><li>Competition among gardens for funding, limited funds available</li></ul>	Economic: ➤ Cost vs. value	<ul style="list-style-type: none"><li>Local organic produce can be more expensive than conventional</li></ul>

Environmental: ➤ Land and infra-structure location, land tenure	<ul style="list-style-type: none"> <li>Distance from garden to neighbor-hood</li> <li>Land availability</li> <li>Water availability</li> </ul>	Environmental: ➤ Handling resources effectively	<ul style="list-style-type: none"> <li>Need for addressing compost on-site</li> </ul>
<b>Participants' Most Successful Moments</b>		<b>Participants' Most Successful Moments</b>	
Community building	<ul style="list-style-type: none"> <li>Became close friends, connections</li> <li>Multi-lingual outreach/promotion of gardens</li> <li>People coming together</li> </ul>	Economic productivity	<ul style="list-style-type: none"> <li>Model to-date that actually creates jobs and produces abundant, wonderful, local, natural food</li> <li>Getting it sold to complete the economic model</li> <li>We're out there literally farming in urban areas, we're selling produce to the general public</li> <li>We're giving people jobs in agriculture</li> </ul>
Physical act of gardening or having gardens	<ul style="list-style-type: none"> <li>We actually got a garden</li> <li>People coming together and making a garden</li> <li>Learning to grow garlic</li> <li>Being a part of a community garden</li> <li>Went from 25 to 40+ gardens in the past few years</li> </ul>	Lifestyle	<ul style="list-style-type: none"> <li>Making sure that people understand what's being created, and how it can be used</li> <li>This isn't for the elite, this is for everybody</li> <li>Everybody sees the concept that way... 'Amish' in thought or character, and 'Steve Jobs' in execution</li> <li>Leaving a legacy</li> <li>"I wish I lived there."</li> </ul>
<b>UA Framework</b>		<b>UA Framework</b>	
Civic agriculture	<ul style="list-style-type: none"> <li>Locally based agriculture and food production that is tightly linked to a community's social and economic development (Lyson, 2000).</li> <li>Engagement in an agricultural 'public work' with an active role in creating a food system (Chung et al, 2005): <ul style="list-style-type: none"> <li>performed by a diverse group of individuals,</li> <li>for the public good, and</li> <li>done in a public space that is open to others.</li> </ul> </li> </ul>	Agricultural urbanism	<ul style="list-style-type: none"> <li>Framework for integrating a range of sustainable food systems into a community at site-, neighborhood-, or city-wide scales (de la Salle and Holland, 2010).</li> <li>Urban form conceived through the spatial, ecological, and infrastructural implications of agricultural production (Waldheim, 2010).</li> </ul>

Form/typology		Form/typology	
Community gardens	<ul style="list-style-type: none"> <li>• Less of one-half acre (typical)</li> <li>• Divided into individual plots, typically 10x10' (9m<sup>2</sup>)</li> </ul>	Urban farms	<ul style="list-style-type: none"> <li>• Several acres</li> <li>• Steward Lots</li> <li>• Neighborhood farms</li> </ul>