

# The Role of Designers in Urban Agriculture



Jessamyn Lett - Spring 2012



# The Role of Designers in Urban Agriculture

## Jessamyn Lett

A Senior Project Presented June 15, 2012 to the Faculty of the Landscape Architecture Program University of California, Davis in Partial Fulfillment of the Requirement for the Degree of Bachelor of Science of Landscape Architecture

Accepted and Approved by:

---

Alrie Middlebrook  
Designer for Middlebrook Gardens  
Committee Member

---

Claire Napawan  
UC Davis Landscape Architecture Faculty  
Committee Member

---

Ellen Burke  
UC Davis Landscape Architecture Faculty  
Committee Member

---

Heath Schenker  
UC Davis Landscape Architecture Faculty  
Faculty Advisor





# Abstract

In recent years urban agriculture has been increasingly incorporated into the landscape. This is in response to an industrial agricultural system, concern about food security, and publicity that has highlighted these issues. Farms are primarily being implemented by non-profit organizations and urban farmers with little design training. This research looks at why urban agriculture is important and why landscape architects and landscape designers should take a more active roll. Case studies determine successful urban agriculture sites and their common elements. The common elements are proposed as guidelines for successful urban agriculture sites. This information is summarized in a booklet, which is intended for an audience of landscape architects and landscape designers, hereafter referred to as designers.





# Acknowledgements

**Alrie, Claire, and Ellen** - Your work has inspired me and your knowledge and enthusiasm has guided me. Thank you.

**Gayle** - Your patience, understanding, and tireless help has been a gift to this class. I could not have done this without you. Thank you.

**My family (Babes included)**- Your support and love keep me strong. Thank you.

**BAAAAH**- Your ability to put up with me as I completed by my senior project is a testament to your amazingness. I love you and will miss you.

**The Landscape Architecture Class of 2012**- To an exceptional class who shares, helps, advises, and loves. It is the initiative we have shown and the encouragement we have given each other that makes us outstanding. This support system has allowed me to graduate and I do not know what I will do without you.







# Table of Contents

Research	1-1
History of Urban Agriculture	1-3
Why is Urban Agriculture Important?	1-5
Land Use	1-5
Sustainability	1-5
Economics	1-7
Community	1-8
Sharing and Creating Culture	1-9
Health, Safety, and Food Security	1-10
Quality of Life	1-11
What is the Role of Designers in Urban Agriculture?	1-13
Case Studies	2-1
Needs	2-2
Social	2-2
Economic	2-5
Environmental	2-7
Which Elements Might Influence Site Success?	2-8
Which Sites Are Good Case Studies?	2-9
City Farmers Demonstration Garden	2-10
Davis Community Garden	2-12
Eagle Street Rooftop Garden	2-14
Ecological Garden	2-16
ELSEE	2-18
Future of ELSEE	2-20
Garden for the Environment	2-22
Little City Gardens	2-24
Rooftop Haven for Urban Agriculture	2-26
UC Davis Olive Center	2-28
Urban Adamah	2-30
Guidelines	2-32
Results	2-34
Conclusion	2-37
References	3-1
Appendixes	3-5





# List of Images

Cover Image - Beets (Created by Author)

## Research

- Image 1.1 - 1915 Illustration of Pingree Farms in a schoolyard in Bronx, NY (New York Tribune, 1915) 1-3
- Image 1.2 - Schrebergarten (allotment garden) in Leipzig in the late 1800's. (Architekturzentrum Wien, 2012) 1-3
- Image 1.3 - Slottsträdgården (allotment garden) in Sweden (Lett, 2011) 1-4
- Image 1.4 - Deerfield Farmers Market (Deerfield, 2012) 1-7
- Image 1.5 - Three Sisters Planting: Traditional Native American companion planting of corn, beans, and squash. (Arid Land Homesteaders League, 2012) 1-9
- Image 1.6 - Traditional Espalier Pruning Form (Ornamental Tree Nursery, 2010) 1-9
- Image 1.7 - Students Farming at the Edible School Yard in Berkeley, CA (Uribe, 2012) 1-11

## Case Studies

- Image 2.1 - May with her grandchildren at Montclair Presbyterian Church Community Garden. (Bailey, 2012) 2-4
- Image 2.2 - Urbanite Raised Beds designed by Terra Nova Landscaping (Terra Nova Ecological Landscaping, 2011) 2-6
- Image 2.3 and 2.4- Pollinators Enjoying the UC Davis Ecological Garden (Lett, 2012) 2-7
- Image 2.5 - City Farmers Demonstration Garden from above (Levenston, 2010) 2-10
- Image 2.6 - City Farmers' County Lane entrance (Levenston, 2010) 2-10
- Image 2.7 - Davis Community Garden Aerial Photo (Google Earth, 2011) 2-12
- Image 2.8 and 2.9- Davis Community Garden entrance in winter and summer, respectively. (WesHardaker, 2007) (jefftolentino,2007) 2-12
- Image 2.10 - Eagle Street Rooftop Farm Axon (Eagle Street Rooftop Farm, 2012) 2-14
- Image 2.11 - View from Eagle Street Rooftop Farm (Eagle Street Rooftop Farm, 2010) 2-14



## Case Studies Continued

Image 2.12 - Ecological Garden Base Map (Hillhouse, 2012)	2-16
Image 2.13 - View of Ecological Garden from Path (Lett, 2012)	2-16
Image 2.14 - ELSEE Base Map (Middlebrook, 2012)	2-18
Image 2.15 - ELSEE student entrance through native plant nursery (ELSEE, 2012)	2-18
Image 2.16 - ELSEE Future Site Plan (Middlebrook, 2012)	2-20
Image 2.17 - Vertical Garden (ELSEE, 2012)	2-21
Image 2.18 - Subterranean Visitors Center (ELSEE, 2012)	2-21
Image 2.19 - Garden for the Environment (Garden for the Environment Facebook, 2010)	2-22
Image 2.20 - Garden for the Environment community class (Garden for the Environment Facebook, 2010)	2-22
Image 2.21 - Little City Gardens (Little City Gardens Facebook, 2012)	2-24
Image 2.22 - Little City Gardens (Little City Gardens Facebook, 2012)	2-24
Image 2.23 - Rooftop Haven for Urban Agriculture Planting Plan (Hoerr Schaudt, 2012)	2-26
Image 2.24 - Rooftop Haven for Urban Agriculture Section (Hoerr Schaudt, 2012)	2-26
Image 2.25 - Rooftop Haven for Urban Agriculture (Hoerr Schaudt, 2012)	2-26
Image 2.26 - Olive trees on UC Davis campus (UC Davis, 2010)	2-28
Image 2.27 - Aerial view of Urban Adamah before and after. (Urban Adamah, 2011)	2-30
Image 2.28 - Urban Adamah (Urban Adamah Facebook, 2012)	2-30

## Case Studies Continued

Image 2.29 - City Farmer's Demonstration Garden (Levenston, 2010)	2-32
Image 2.30 - Eagle Street Rooftop Farm (Eagle Street Rooftop Farm, 2010)	2-32
Image 2.31 - Ecological Garden (Lett, 2012)	2-32
Image 2.32 - Garden for the Environment (Garden for the Environment Facebook, 2010)	2-32
Image 2.33 Rooftop Haven for Urban Agriculture (Hoerr Schaudt, 2012)	2-32
Image 2.34 - City Farmer's Demonstration Garden: Educational area (Levenston, 2010)	2-35
Image 2.35 - Urban Adamah: Gathering space (Urban Adamah)	2-35
Image 2.36 - Garden for the Environment - Composting (Garden for the Environment Facebook, 2010)	2-35
Image 2.37 - Ecological Garden: Butterfly Garden (Lett, 2012)	2-35



# Preface

I chose urban agriculture as my senior project because I love plants, the outdoors, and design. I am also passionate about food and more specifically fresh, good, real food. I was familiar with the idea of urban agriculture and I had looked into allotment gardens in Northern Europe, but I felt I had so much more to learn. My ideal senior project would have consisted of reading, visiting urban farms, talking to urban farmers, and eating; I had no product in mind and I wanted to spend my entire senior project asking questions. With the help of a wonderful committee I was able to focus my questions into a product: the booklet, 'The Role of Designers in Urban Agriculture'. This paper explains my process and the questions I asked that led me to conclude that urban agriculture is a vital resource for professional landscape designers and landscape architects, and one that must be utilized to feed and care for an increasingly large, urban, and unhealthy population.







# What is Urban Agriculture?

For the purposes of this paper urban agriculture is defined as farms where:

- Sourcing of materials and the actual farming must occur in an urban setting.
- One of the farmer's intents is to produce a food product.
- The farm increases the urban boundary's net sustainability.

*This definition is not meant to exclude farmers who function at other scales or with other goals, but is meant to narrow the search for information within the parameters of this project.*

The definition is a combination of existing definitions and closely resembles the United Nations Development Programme's (UNDP) definition of urban agriculture,

*"...an industry that produces, processes and markets food and fuel, largely in response to the daily demand of consumers within a town, city or metropolis, on land and water dispersed throughout the urban and peri-urban area, applying intensive production methods, using and reusing natural resources and urban wastes to yield a diversity of crops and livestock" (1996).*

The relevant points of the UNDP's definition is that it limits the physical boundaries to urban and peri-urban areas, it requires that urban agriculture be intensive and use/reuse urban wastes, and that urban agriculture must be product driven. Although the UNDP considers both food and fuel acceptable products, this paper is focusing only on food. The project's definition also considers Hodgeson's definition of urban agriculture, "the production of food for personal consumption, education, donation, or sale and includes associated physical and organizational infrastructure, policies, and programs within urban, suburban and rural built environments" (2011). This definition again highlights the importance of food as the product and adds the possibility of additional intentions. A combination of these two definitions results in the requirement that, "one of the farmer's intents is to produce a food product."



This project's requirement that urban agriculture improve net sustainability is a reflection of the focus on natural, organic, future oriented elements of urban agriculture as discussed in the literature (Johnson, 2010; Carpenter, 2009; Warren, 2011; Brooklyn Botanic Gardens, 2011). Using sustainability as a measurement captures the broad range of ideas and urban agriculture practices that are connected to producing food naturally and protecting the future as it relates to urban agriculture.

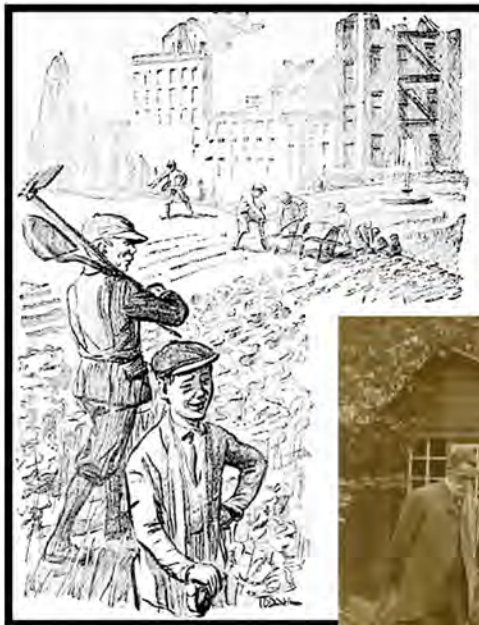
The last definition that reinforces the importance of limiting physical location and requiring the production of a food-based product is UC Davis assistant professor, Claire Napawan's definition of urban agriculture. She has modified the American Planning Association's definition to be:

*“Urban agriculture entails the production of food (and non-food products) for personal consumption, education, or sale within urban, peri-urban, or suburban built environments, which utilizes existing urban, peri-urban, or suburban resources and conditions to support its production.”*

Urban agriculture is distinct from agriculture because of its physical location requirements, the product requirement, and the sustainability requirement.

# History of Urban Agriculture

Urban agriculture's historical success creates a basis for urban agriculture models today. Urban agriculture began its prominence in the USA in 1893, during the depression, due to the encouragement of the Detroit mayor at the time, Hazen Pingree. Pingree responded to the threatened food shortage by encouraging a model similar to the allotment gardens of Europe. He used the principle of *usufruct*, the right to use property owned by another provided you don't harm it (Tracey, 2011), to allow citizens to grow food on vacant lots (Carpenter, 2009). Farms termed 'Pingree Farms' during the depression morphed into war gardens during World War I and victory gardens during World War II. In 1943, victory gardens produced 40% of the countries fresh vegetables (Johnson, 2010). Basic historic models were those of allotment gardens, in the United States of America they are generally referred to as community gardens, and victory gardens, which were typically residential yards cared for by the owner (Carpenter, 2009).



1915 Illustration of Pingree Farms in a schoolyard in Bronx, NY  
Image 1.1

Schrebergarten (allotment garden) in Leipzig in the late 1800's.  
Image 1.2



Historical models also provide an example of successful community engagement and acceptance of urban agriculture on a personal and neighborhood scale. This is beneficial because it shows that shifting social need and publicity can create acceptance of urban agriculture, but it has created a mindset that larger scale and for profit urban agriculture is undesirable, and should be rejected. Lorraine Johnson author of “City Farmer” highlights the emergence of urban agriculture in times of need and articulates that we are in need again. The world needs to use its resources in order to successfully provide for everyone, but due to increasing population and a population migration into cities, the scale of urban agriculture needs to be expanded and existing models and maintenance of urban agriculture needs to be overcome (2010).



Slottsträdgården (allotment garden) in Sweden  
Image 1.3

# Why is Urban Agriculture Important?

## Land Use

Land use is changing and urban agriculture is a vital part of that shift. The U.S. Census projects that in less than 50 years the population of the United States will surpass 400 million people and that 80% of those people will be living in metropolitan areas. The food system is failing to meet the needs of the growing population. In 2008, 50.2 million people in the United States, that is 15% of the population, was not getting enough to eat. Global food production is sufficient, but cost and poor distribution prevent everyone from having enough to eat (Cockrall-king, 2012). To create a food system where food is accessible the production of food will have to become localized, which requires urban agriculture.

## Sustainability

Sustainability has many definitions and urban agriculture is able to address most of them, including the definition of sustainability as a closed loop system (UNDP, 1996) and the Brundtland definition which defines sustainable development as, “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Commission on Environment and Development, 1987). The Sustainable South Sounds, a sustainability group in Seattle, WA explains that they chose to support urban agriculture as one of their projects because it meets the Brundtland definition of sustainability (Sustainable South Sounds, 2012). Urban agriculture is able to address such a variety of definitions because it impacts all three of the “legs of sustainability”: environment, economy, and equity (Nordahl, 2009). Some specific sustainable changes made by urban agriculture are: to reducing packaging, increase food access, reduce the need to transport food and food products, reuse ‘waste’ through compost, increase biodiversity, provide habitat, and encourage pollinators (Johnson, 2010).

This project will be using Stephen Mouzon's, author of 'The Original Green' (2010), definition of sustainability, "keeping things going in a healthy way long into an uncertain future". Mouzon lists "The top ten better ways of being green" where he uses the term green as a synonym for sustainability. He lists these principles to create a foundation of a sustainable future. Although urban agriculture can address the entire list of ways of being green, four of these closely connect to the goals that urban agriculture can help landscape architects achieve.

1. **The involvement of everyone** is very similar to the concept of creating a community. Everyone must participate to change the business as usual model into a sustainable model and urban agriculture invites and encourages everyone to work together as a community.

2. **The source of stuff** refers to the importance of producing near users, so transportation and storage are not the energy sinks they currently are. Urban agriculture moves production of fresh fruits and vegetables into the city and often times into consumer's backyards.

3. **The simpler way** is an economic model that ensures that the fewest inputs are used. This is true of urban agriculture, because it is easier and more logical to produce food where workers are abundant to replace the use of fertilizer, pesticide, and tractors.

4. **The sharing of wisdom** is passing on and spreading ideas that work in the local context. Diversity and cultural awareness brought on by urban agriculture allows successful traditions and newly discovered knowledge to be spread.

## Economics

The UNDP (1996) sums up the economic importance of urban agriculture in 'Urban Agriculture: Food, Jobs and Sustainable Cities'. They explain that urban agriculture is currently a significant economic activity that is undervalued due to its difficulty in being traced because many of its products are traded in unofficial markets. Still, urban agriculture is a rapidly growing industry. Johnson (2010) adds that worldwide over 100 million people derive direct income from urban agriculture and urban farms produce around 35% of fresh food consumed in the United States. The growing sector of urban agriculture will increase the demand for urban agriculture to be included in designed sites.



Deerfield Farmers Market  
Image 1.4

## Community

Randy Hester, author of 'Design for Ecological Democracy,' refers to the community aspect of the landscape experience as centeredness. Centeredness is the "aggregate of shared experiences, activities, and interests and of associated settings". Hester explains that for individuals to become communities the landscape architect must have settings that "draw them together for face-to-face civic engagement". (Hester, 2006). Urban agriculture provides an excellent opportunity for this engagement and offers many success stories of creating community and uniting neighborhoods (MRSC, 2012). John Lanterman, principle of The Planning Group, and head of the Urban Agriculture Project, utilizes urban agriculture to involve community (2012). Urban agriculture increases the sense of community by creating resilience in communities, creating mutual trust, sharing, and friendship, and encouraging an 'eyes on the street' community where neighbors watch out for each other (Hodgson, 2011).

Novella Carpenter, author of *Farm City*, used her farm to create a community: Her book starts, "I have a farm on a dead-end street in the ghetto." She created her farm in downtown Oakland on a street with "gunfights in the middle of the day, a general state of lawlessness, and now this: livestock". She was nervous about theft or vandalism, but in truth through her farm she became familiar with her neighbors, such a Lana "[she] was theatrical: expressive hazel eyes, a gap-toothed smile, and a platinum crew cut... she held two shovels in her strong arms". By farming together and sharing food Carpenter used her farm to create a community (2009).



## Sharing and Creating Culture

Urban agriculture allows people to grow culturally significant food and cultivate traditional garden forms, which connect them to their histories (Brooklyn Botanic Gardens, 2011). The unique food and forms can then be shared with neighbors and youth, increasing awareness and acceptance. Carpenter exemplifies this process when she grows traditional foods from many of her neighbors' cultures and shares them (2009). Shared gardening and food become a vector for the development of a unique local culture. Urban agriculture recreates a lost sense of culture by combining old traditions with a sense of place and the seasons (Johnson, 2010).



Three Sisters Planting  
Traditional Native American companion  
planting of corn, beans, and squash  
Image 1.5



Traditional Espalier Pruning Form  
Image 1.6

## **Health, Safety, and Food Security**

Health, safety, and food security are all directly linked to urban agriculture. Urban agriculture improves health in two ways – by stimulating activity through the work of gardening and providing healthy food to eat (Johnson, 2010). Locally grown food is often more nutritious too, because naturally grown heirloom varieties of produce contain more nutrients than those produced by traditional agriculture. Locally grown food is also safer, when the consumer is producing their own food, they control all the inputs; whereas only 1.3% of imported food is USDA inspected (Johnson, 2010).

Urban agriculture ensures food security for the poor and those with limited mobility by providing the opportunity to produce your own food and by providing locally accessible food sources (Koc et al, 1999). By implementing urban agriculture, cities can become self sufficient when feeding themselves, reducing food deserts and their dependency on distant food sources. In Vancouver, for example, there are an estimated 6,515 available acres of land that can be converted into food gardens, which is enough to feed the entire city. (Levenston, 1980).

## Quality of Life

Quality of Life is a difficult to measure, but vital component of urban agriculture. Urban agriculture can calm the mind and enrich the soul through meditative action. Food grown at home is also higher quality and better tasting because it is fresher and generally uses more nutritious and tastier varieties of plants. Urban agriculture also creates social interaction by providing a link to a network of people with similar needs, problems, and interests. Urban agriculture also interests neighbors and children, which invites conversation and sharing and strengthens bonds (Johnson, 2010). All of these experiences improve quality of life.



Students Farming at the Edible School Yard in Berkeley, CA

Image 1.7



# What is the Role of Designers in Urban Agriculture?

Designers must adopt and implement urban agriculture. It is clear that urban agriculture is important, but the majority of urban agriculture sites are created by master gardeners, non-profit organizations, inexperienced farmers, and citizens.

Designers must join in the implementation of urban agriculture because:

1. Urban agriculture is being implemented in spaces that are traditionally the realm of the designer.
2. Designers are necessary if urban agriculture is to thrive.
3. Urban agriculture is an important tool designers can use to implement their design goals.
4. Urban agriculture increases sustainability.
5. Urban agriculture is in demand and to succeed designers must be able to meet that demand.

This information has resulted in a booklet that delves deeper into these reasons and presents them to designers (see Appendix A).



# Case Studies

The purpose of completing case studies is to form guidelines that designers can follow to create successful urban agriculture sites. The guidelines are based on common elements and features in successful urban agriculture sites. Urban agriculture addresses a wide variety of needs, for example sustainability, building a community, and safety. This variety is what makes urban agriculture unique; very few urban landscapes can provide such a variety of benefits as an urban farm (Deelstra et al, 2001). Thus the most successful urban agriculture sites are the ones that are able to address the most needs. To determine the most important site elements ten case studies were completed. Each site was analyzed for their ability to meet a matrix of needs, which were looked at as markers of success. A successful urban agriculture site should address at least nine of the following needs, at least one from each category of Social, Environmental, and Economic.

## Needs

This paper addresses the needs of a city and neighborhood. Although urban agriculture can meet the needs of individuals, businesses, or special interest groups, designers must always design within the context of a city and neighborhood (Rogers, 2011).

### **Social Needs:**

• ***Improve aesthetics:*** Many areas are rife with abandoned lots, empty spaces, and neglected gardens (City Slicker Farms, 2010). Urban agriculture is a logical solution for neighborhoods whose want to improve their appearance. Urban agriculture can be beautiful (Johnson, 2012) and will remain beautiful because urban agriculture has high levels of community involvement, which ensures maintenance (Hodgson, 2011). To determine if a site meets the aesthetic improvement need, articles and reviews of the site must comment positively on the site aesthetics. If reviews comment both negatively and positively on the aesthetics of the site or there is no comment on the aesthetics of the site the author's aesthetic judgment is used.

• ***Provide public open space:*** Urban farms can function effectively as public open space (Napawan, not yet published). Open space is needed in many cities to provide relief and escape, but justifying open space has become increasingly difficult as the population density of urban spaces increase (Napawan, The Political Economy of Place). If a site is open to the public a minimum of 32 hours a week it provides public open space.



• **Education:** Many cities and school communities are restructuring their curriculum to incorporate elements of food production, stewardship, and environmental literacy. In California the new Education and Environment Initiative curriculum (EEI) requires students to become environmentally literate, often using outdoor laboratories to teach these topics (EPA, 2012). Urban agriculture presents itself as a perfect way of reaching the goals of environmental literacy by creating a place for hands-on learning (ELSEE, 2012). The requirements of EEI created a need to incorporate better methods of teaching environmental literacy. Urban agriculture sites can meet those requirements. The success of urban agriculture sites as an educational tool is also true for adults, and cities often need to educate their residents about compost to reduce their waste stream and building methods that reduce their energy needs (Johnson, 2010). An urban agriculture site provides education if it hosts classes for students or residents.

• **Increase access to fresh food:** Many cities cannot provide their residents with sufficient, accessible, healthy food using the current supermarket model of food distribution (Cockrall-king, 2012). Urban agriculture puts food in the places that need it most. Organic, sustainable, high-yield urban farms and backyard gardens can meet the basic need for healthy food (City Slicker, 2010). City Slickers Farm is an urban farming organization that implements both high-yield urban farms and backyard gardens that provide food to low-income West Oakland residents. They surveyed the recipients of their backyard gardens and found that 88% of the recipients of their backyard gardens now consume fresh fruits and vegetables at least once a day. If an urban agriculture site produces food that is donated to or sold at low cost in areas with poor access, the site is able to increase access to fresh food.

• **Improve resident's health:** Obesity is an epidemic in the United States fueled by poor diets and lack of activity. Healthier lifestyles are being encouraged at a city level through city design (Jackson, 2012). Urban agriculture provides cities with two ways to improve resident's health – by stimulating activity through the work of gardening and use of farms as open space and providing healthy food to eat (Johnson, 2012). If a site provides gardening opportunities to the public and/or provides produce to the community it improves citizen's health.

• **Community building:** Neighborhoods need a sense of community to increase safety, through an 'eyes on the street' approach, and improve resident's quality of life. Urban agriculture can provide this community (Hodgson, 2011). If there is regular volunteer, gardening, or educational components available to the community, the site builds community.



May Tong with her grandchildren  
at Montclair Presbyterian Church Image 2.1

## **Economic**

- ***Provide jobs:*** Urban agriculture provides jobs (Hodgson, 2011). Some jobs that are created by urban agriculture include Management positions such as Program Manager or Executive Director, farming positions such as Operations Manager or Farmer, and outreach such as Garden Education Coordinator or Youth Programs Manager (Garden for Environment, 2012; City Slicker, 2010; Little City Gardens, 2012). Training, internship, or apprenticeship programs also provide job training at many urban farms (Urban Adamah, 2012; Eagle Street Rooftop Farm, 2012). If the site employs three or more people full time or three or more people part time and offers a job training program it provides jobs.
- ***Afford maintenance costs:*** Cities need to be able to fund the maintenance of their parks, streetscapes, and other public space. Often this maintenance can be expensive, but one solution is creating urban agriculture where the profits cover the cost of maintenance (Lanterman, 2012; Hodgson, 2011). If the profit from selling the produce is sufficient to cover the cost of maintaining the site, then the site can afford their maintenance costs.
- ***Stimulate a local economy:*** For every dollar spent at a chain store only \$0.43 stays within the city, whereas \$0.68 of a dollar spent at an independently owned business stays within the city (Indiebound, 2008). If the product is produced within the city, an even higher proportion of the money spent stays within the city. The production and selling of locally produced food strengthens a local economy (UNDP, 1996). If a site sells produce to local consumers or businesses it stimulates a local economy.

## **Environmental:**

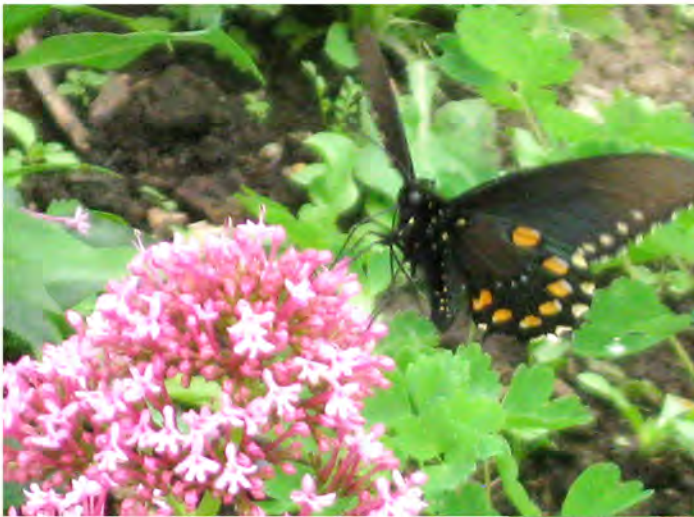
• ***Reduce vehicle miles traveled:*** Reducing vehicle miles traveled is important because it decreases petroleum use, green house gas emissions, pollution related to driving, road congestion, and road damage, which improves the air quality of a city and reduces the need for road repairs and road widening (Kendall, 2012). Food travels an average of 1500 miles between the farm and the consumer, but urban agriculture is able to reduce this drastically by providing food at the source (Johnson, 2011). If the site sells food locally it reduces vehicle miles traveled.

• ***Utilize urban waste, improve soil quality and reduce runoff:*** Urban agriculture uses urban waste such as organic waste and urbanite (reclaimed, broken-up concrete) (Carpenter, 2009). UC Davis assistant professor Claire Napawan found that in San Francisco urban farms were able to process 0.3% of compostable waste, while only consuming 0.03% of the land (2012). Urban agriculture primarily uses organic waste in the form of compost. Compost is a key addition to poor quality soils and helps to add nutrients and organic matter. Toby Hemenway (2009), author of 'Gaia's Garden' explains that improved soil increases water retention, thus reducing runoff. Soils with higher holding capacities require less irrigation and reduce peak flow so less stress is placed on storm sewer systems (EPA, 2007). If a site composts, mulches, or otherwise increases the amount of organic matter in the soil it is using urban waste, improving the soil quality, and reducing runoff.



Urbanite Raised Beds designed by Terra Nova Landscaping  
Image 2.2

- **Reduce CO<sub>2</sub>:** Many cities are attempting to reduce their CO<sub>2</sub> (Global Carbon Project, 2011) and planting trees and large perennial shrubs can help. Mature trees can absorb roughly 48 pounds of CO<sub>2</sub> a year (Clean Air Gardening, 2012) so planting fruit and nut trees can lower CO<sub>2</sub>. If a site has multiple large shrubs it reduces CO<sub>2</sub>.
- **Provide habitat:** Declining pollinator habitat is a national concern, with over 90 commercial crops requiring honeybee pollination (Eilperine, 2006). The decline in many pollinator groups is associated with habitat loss (Rathcke, 1993). To provide habitat an urban agriculture site must include native plants or a dedicated pollinator garden or section.



Pollinators Enjoying the UC Davis Ecological Garden  
Image 2.3 and 2.4

## **Which Elements Might Influence Site Success?**

The guidelines are based on the common site elements of the most successful sites. Important site elements were identified prior to the identification of the most successful sites based on Mark Francis's case study method for landscape architects. The case studies completed are not full or in-depth case studies and are closest to the amount of information found in a case study's abstract. Francis' list of baseline information was the start of element list. His baseline information includes:

- Site location
- Size
- Client
- Designers
- Consultant(s)
- Density
- Land use type

The site elements for this study includes all of these points except the element client has been further broken into site owner and site user, consultant was removed from the list because there is rarely a consultant, and density and land use type were relabeled as features to better match the needs of an urban agriculture site.

Additional elements were determined based on Claire Napawan's paper 'Multi-Functional Space: Evaluating Urban Farms as Public Open Space' (not yet published), which mentioned the integration of the site into the community, the significance of visual access, and the impact of a site being for profit or not when related to urban agriculture. Based on that information the following elements were added:

- Integration into site – This looks at the distinction between neighboring sites, or if it is incorporated. This also looks at edge treatment.
- Visibility – This is concerned with both physical visibility (rated low-high) and profile in terms of publicity.
- For profit

The last step in creating the site elements was a consideration of what the farmers considered important. Farm websites (Brooke, 2012; City Farmer, 2012; Eagle Street Rooftop Farms, 2012; Garden for the Environment, 2012) provided the point of view of the farmer and additional elements were deemed important:

- Date the farm was founded
- Purpose of the farm

Based on this analysis the complete list of elements analyzed for each site includes:

- Site Location
- Site size
- Founded in
- Integration into site
- Visibility
- Owner
- User
- Purpose
- Designer
- Features
- For profit

All case studies also feature a plan view or drawn design of the site, if available, to express the site layout and at least one picture from the street or within the site to visually express the experience and character of the garden.

## **Which Sites are Good Case Studies?**

All the case studies had to fit the definition of urban agriculture. Aside from that the most important element when choosing sites was to show a variety of element combinations to ensure each element is considered independently.

# City Farmer's Demonstration Garden



City Farmer's Demonstration Garden from above  
Image 2.5



City Farmer's County Lane entrance  
Image 2.6



# City Farmer's Demonstration Garden

**Site elements:** City Farmer's Demonstration Garden is a 2,500 sq. ft. site in Vancouver, B. C. that began in 1982 to educate residents of Vancouver about how to grow food, compost, ect. In addition to the site City Farmer also manages a website and a hotline, and has become a resource for many other cities. The site is managed by Head Gardener Michael Levenston, two garden designers, and an agriculturalist. The site itself is fenced in and surrounded by blackberries, but has a inviting front entrance. The garden features a food garden, water wise plant garden, ability garden, compost, 'green' cob buildings and green roofs, natural lawn care, and technologies including wall gardening, indoor aeroponics, keyhole gardening, cold frames, mushrooms, and alternative pest management.

**Needs met:** This site meets all the social needs. It is aesthetically pleasing despite the fencing, it provides public access, education is the focus, and the produce is donated to a local hospice, which increases access to healthy food. Through the donations and classes, City Farmer's Demonstration Garden improves residents health and builds community.

Economic needs are met because this site is able to provide jobs, but selling produce does not fund the site and little is done to stimulate a local economy.

This site meets all the environmental needs. By donating food the number of vehicle miles traveled is reduced. The site uses urban waste and compost onsite and encourages compost at a residential scale. The site has trees, perennials and flowers, which reduce CO<sub>2</sub> and provide habitat (City Farmer, 2012; Levenston, 2012).

# Davis Community Garden



Davis Community Garden  
aerial photo  
Image 2.7



Davis Community Garden entrance in winter and summer, respectively  
Image 2.8 and 2.9

# Davis Community Garden

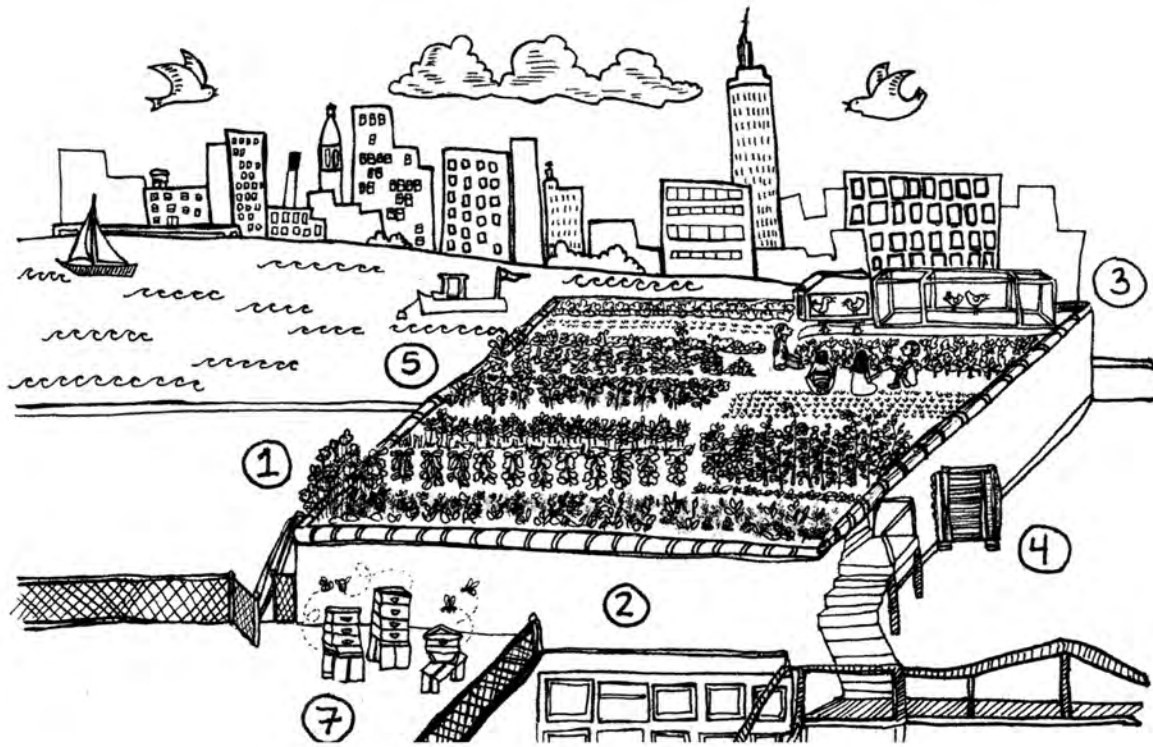
**Site elements:** The Davis Community Garden is a 60, 000 sq. ft. site in Davis, CA. The site is owned and maintained by the City of Davis Community Services Department, which hires one employee, the Community Garden Coordinator, currently Jane Schafer-Kramer, part time. The maintenance is performed by the individuals who rent the 116 plots. The purpose of the community garden is to provide a positive gardening experience in productively used garden plots. The garden features rentable plots, a garden center, an herb plot, a perennial plot, and a donation garden.

**Needs met:** This site increases access to food and improves residents' health by providing a place to grow food; this process builds community. This site is not aesthetically pleasing nor publicly accessible. Although anyone can put themselves on the list to rent a plot, this site does not welcome people without plots. There is no educational component.

This site does not meet any economic needs. It provides only one part time job, no one is allowed to profit from the food produced on the land, and no local economy is stimulated.

Environmentally the benefits are limited. The site does not reduce vehicle miles traveled, it does not significantly reduce CO<sub>2</sub> because the majority of the plots only grow annuals, and there is very little habitat. The only environmental need this site meets is the need to use urban waste, improve soil quality and reduce runoff (City of Davis, 2012; Schafer-Kramer, 2012)

# Eagle Street Rooftop Garden



Eagle Street Rooftop Farm Axon  
Image 2.10



View from Eagle Street Rooftop Farm  
Image 2.11

# Eagle Street Rooftop Garden

## **Site elements:** Eagle Street

Rooftop Farm is a 6000 sq. ft. green roof in Brooklyn, NY. It first opened in April 2009 on the roof of Broadway Stages, a local company who decided to hire Goode Green Greenroof Design and Installation to design and construct a rooftop farm. The farm was constructed for the green roof benefits and to produce a profit. The farm is managed by the Farm Manager, Market Manager, Farm to Chef Liaison, Farm Based Education Coordinator, around six apprentices, and volunteers. The green roof is visually disconnected from the area because it is difficult to see from the street, but the farm features annuals, flowers, bees, chickens, rabbits, and an onsite farmers market. The produce is sold to restaurants and at the farmers market.

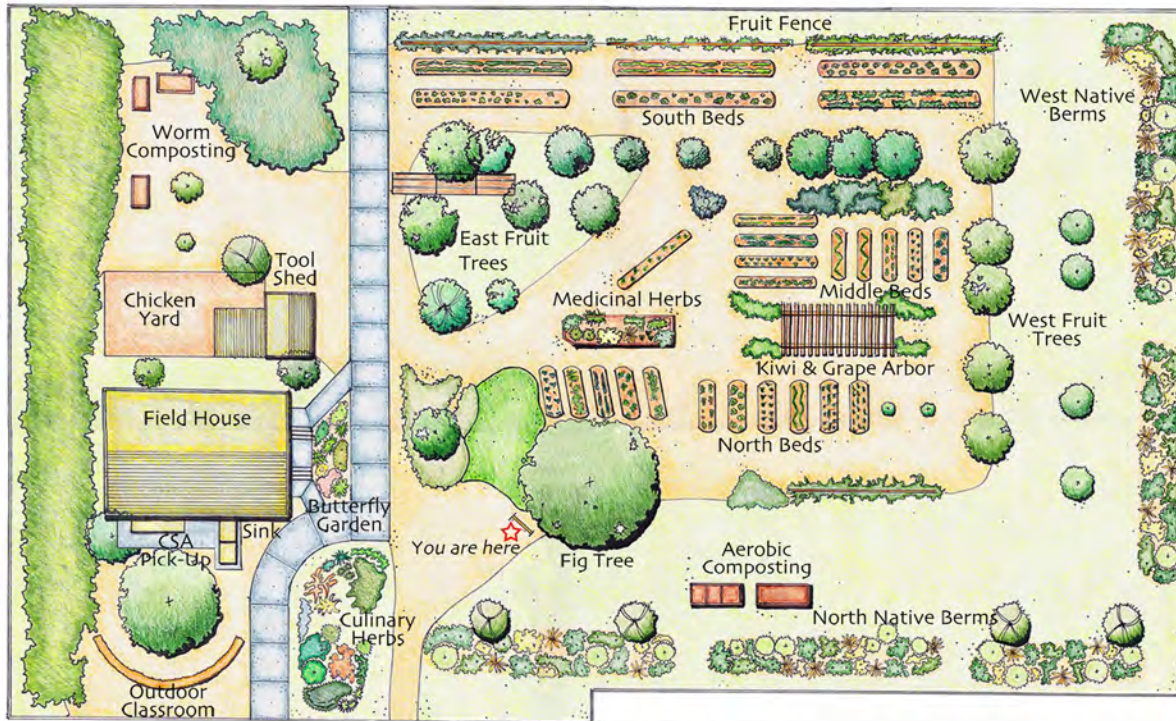
## **Needs met:** Eagle Street

Rooftop Farm is reviewed as beautiful despite its low visibility. The volunteer opportunities and classes improve citizens health and build a sense of community. The site provides very limited public access, only Sundays from 1-4, but during this time there is a free lecture series that provides education.

This site meets many economic needs. The farm provides four jobs and job training in the form of apprenticeships. It is for profit so can easily afford the cost of upkeep, and stimulates a local economy.

This site reduces vehicle miles traveled by selling produce locally. Converting a previously impermeable roof increases soil and greatly reduces runoff. The site provides habitat for pollinators. The roof and climate make it difficult to accommodate perennials or trees, so there is little CO<sub>2</sub> reduction (Eagle Street Rooftop Farms, 2012).

# Ecological Garden



Ecological Garden Base Map  
Image 2.12



View of Ecological Garden from Path  
Image 2.13

# Ecological Garden

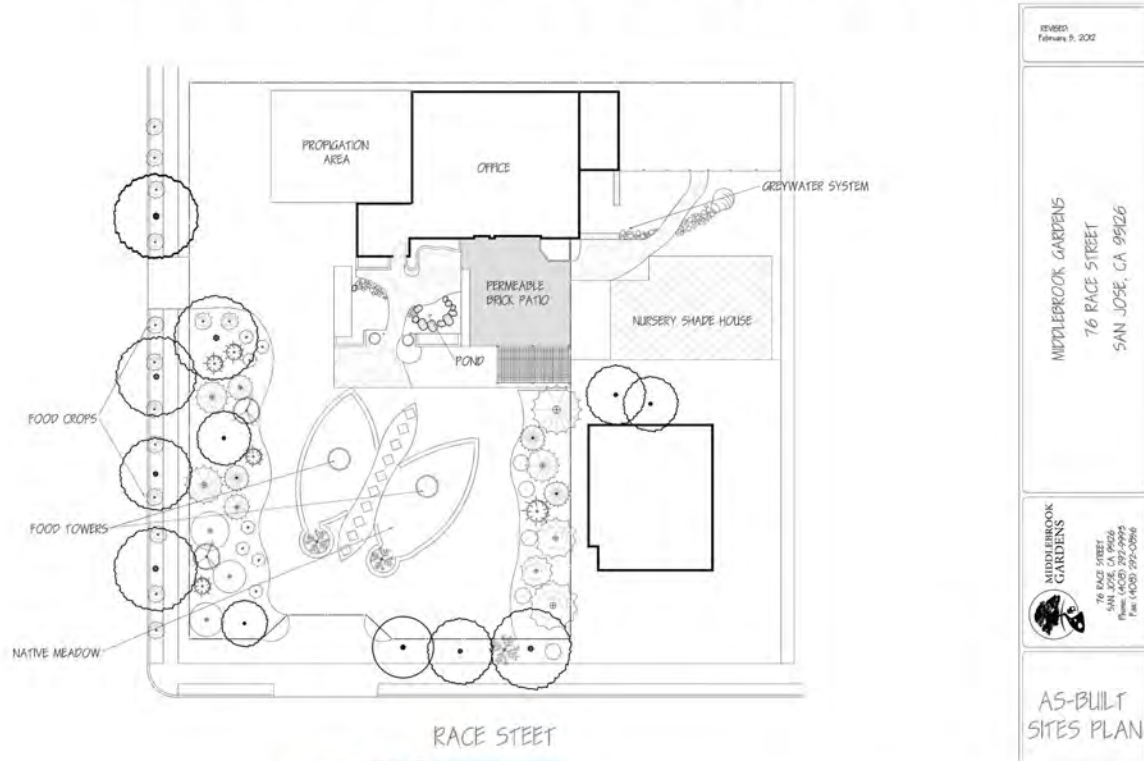
**Site elements:** The Ecological Garden is a 53,100 sq. ft. unfenced site on the UC Davis campus. It was founded in 1980 by Solomaon Teklu and expanded by Tammy Chinn to provide UC Davis students, grade school children and adult visitors education opportunities. Head Gardener Carol Hillhouse, Assistant Head Gardener, School Gardens Coordinator, Graduate Student Researcher, and Lead Student Gardener, and 10-12 student volunteers manage the site. This site features chickens, compost, annuals, perennials, fruit trees, a pollinator garden, and an outdoor classroom.

**Needs met:** This site meets most social needs. It is an aesthetically pleasing site that provides public access and is often used by students. The site is focused on education and improves citizen's health by accepting volunteers. The volunteering, tours, and demonstrations build community.

The site provides jobs, although it does not fund itself based on food production and it does not stimulate a local economy because it sells nothing.

Because the majority of what the site produces is used for educational purposes it does not reduce vehicle miles traveled, but it does utilize urban waste, produce compost, and reduce runoff. The trees and perennials also reduce CO<sub>2</sub> and the area provides a habitat for pollinators (Hillhouse, 2012).

# The Environmental Laboratory for Sustainability and Ecological Education



ELSEE Base Map  
Image 2.14



ELSEE student entrance through native plant nursery  
Image 2.15



# The Environmental Laboratory for Sustainability and Ecological Education

**Site elements:** The Environmental Laboratory for Sustainability and Ecological Education (ELSEE) is a 17,424 sq. ft. site in San Jose, CA. Volunteers from the California Native Garden Foundation (CNGF) taught the first class in March 2010. This site is a Sustainable Sites Initiative site. The ELSEE site currently functions as an outdoor classroom for St. Leo the Great Elementary and Middle School, whose students attend weekly classes that tie into their curriculum. The site was created to produce organic food, protect the soil, air, and water, and teach on-going stewardship. This site is designed and run by Alrie Middlebrook and the CNGF. Currently the site includes the offices of Middlebrook Gardens, a indoor teaching area, an outdoor teaching area, an aerobic compost production area, a native plant nursery, and regional plant communities.

**Needs met:** ELSEE is able to meet many social needs. It is a beautiful site that includes art and showcases responsible garden design techniques. ELSEE is able to improve citizens' health by encouraging students to eat healthily. A strong community is also created through school and volunteer opportunities.

The site stimulates the local economy by providing the only native plant nursery in San Jose, but the maintenance costs are not covered by profits and no jobs are created.

This site uses urban waste, improves soil quality, and reduces runoff by the use of compost and other reused materials such as tire planters. ELSEE has a variety of native perennial plants and trees that are able to reduce CO<sub>2</sub> and in combination with the butterfly garden provide habitat and attracts many pollinators (ELSEE, 2012; Middlebrook, 2012).

# The Future of ELSEE

The ELSEE site has been redesigned to include growing methods that pioneers new technologies for school grounds, but the implementation is pending grant money. The new site has five focuses: education, eating, sustainability, creating, and growing. Although the entire site incorporates all of these goals, specific elements highlight each goal.

The education-focused elements include a subterranean rammed earth visitor's center with a native grass roof garden. This will function as a reception area, a computer lab, a library, bookstore, and meeting space. This is a multi-function building that will exemplify alternative construction techniques.



ELSEE Future Site Plan  
Image 2.16

# The Future of ELSEE

A stacked shipping container classroom and dorm promotes the education of interns who will live and learn in the space. The ELSEE site will also include an outdoor kitchen as part of the process of learning about how food is grown, processed, and eaten.



Vertical Garden  
Image 2.17

The sustaining elements are solar panels that will go over the nursery, a windmill on the shipping container dorm and classroom, and a grey water system that creates a wetland environment.

The new site will address many needs and be an excellent example of a successful urban agriculture site.



Subterranean Visitors Center  
Image 2.18

One of the most important elements of the ELSEE garden is a vertical garden. It will use both aquaculture and hydroponics in a circulating system to produce traditional high-energy crops such as lettuce, allowing more land to be put toward native habitat.

A large area of the site will be given to native edible plants such as currants, miner's lettuce, and nettles. The food grown will be served at an onsite restaurant, Eating California (ELSEE, 2012; Middlebrook, 2012).

# Garden for the Environment



Garden for the Environment  
Image 2.19



Garden for the Environment community class  
Image 2.20

# Garden for the Environment

**Site elements:** The Garden for the Environment is a 21,780 sq. ft. site in San Francisco, CA on San Francisco Public Utilities Commission land. It began in 1990 and is integrated into the park system. It has visually permeable planted borders and multiple entrances and is staffed by Executive Director Blair Randall, Program Director, Program Manager, Youth Programs Manager, Sustainable Landscape Educations Manager, Garden Education Coordinator, and volunteers. The original purpose was to promote efficient water-management and composting education, and to boost volunteer interest, the food is donated. The garden includes demonstration gardens, teaching areas, annuals, bees, pollination plants, and fruit trees.

**Needs met:** The Garden for the Environment meets all the social needs. It is aesthetically beautiful, well maintained, available to the public and receives great reviews. The site has four different education programs, a three month intensive gardening and composting educator training program, monthly compost education workshops, the Resource Efficient Landscape Education series, and the school education program. These education programs and the volunteer opportunities encourage activity.

This site created six jobs, but does not sell produce to make up maintenance costs or stimulate a local economy.

The Garden for the Environment utilizes urban waste in the form of reused materials and compost, which improves the soil and retains more rainwater. The site also has many trees and perennials that reduce CO<sub>2</sub> and provide habitat (Garden for the Environment, 2012).

# Little City Gardens



Little City Gardens  
Image 2.21



Little City Gardens  
Image 2.22

# Little City Gardens

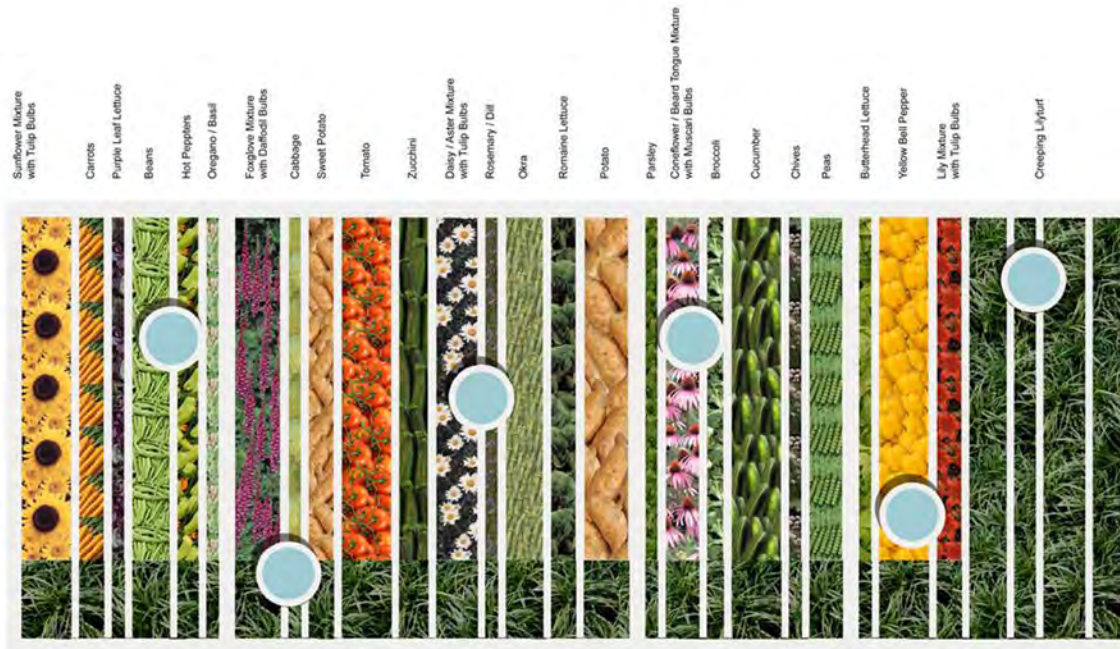
**Site elements:** Little City Gardens is a 43,560 sq. ft. site in San Francisco, CA. This site began in 2008 as an empty lot, that was purchased by Brooke and Caitlyn, two farmers. This is a for profit farm that produces mostly salad greens as well as some flowers and sells CSA boxes, has a booth at the farmers market, and sells to restaurants. The site has low visibility because it is fenced in, but it is popular amongst the neighbors.

**Needs met:** This for profit farm meets some social needs. It is aesthetically pleasing and improves citizens health by selling healthy foods. It does not provides public access, educate users, increase access to food, or build community.

Economically the farm's profit covers the cost of maintenance and it stimulates a local economy. The site provides only two jobs.

The site also has environmental benefits because it reduces vehicle miles traveled by providing local food and it uses urban waste, improved the site's soil quality, and reduces runoff. Little City Gardens does not have perennials or trees that reduce CO<sub>2</sub> and it does not have a significant planting of habitat (Brooke, 2012).

# Rooftop Haven for Urban Agriculture



Rooftop Haven for Urban Agriculture Planting Plan  
Image 2.23



Rooftop Haven for Urban Agriculture Section  
Image 2.24



Rooftop Haven for Urban Agriculture  
Image 2.25



# Rooftop Haven for Urban Agriculture

**Site elements:** The Rooftop Haven for Urban Agriculture is on the Gary Comer Youth Center in Chicago, Illinois. It is a 8000 sq. ft. green roof that began in June 2010. Although the site is not visible from the street, it is very visible from within the building because it is surrounded by windows from the third story classrooms. The site is also very high profile, having won the ASLA 2010 professionals award, being visited by First Lady Michelle Obama, and on the cover of 'Carrot City', a book of urban agriculture sites. The primary users of the roof are the youth because the farm is incorporated into their education. The site was designed by Hoerr Schaudt Landscape Architects and features art, pollination plants, and annuals.

**Needs met:** This site meets all the social needs. The site is noted for its aesthetics that incorporate functionality with pattern and art. It provides public access to youth for the purpose of education and the food produced is then used in the cafe in the youth center. The healthy cafe options and the rooftop farming improve the youth's health and the farm is part of the center's community.

Economically the roof is able to stimulate a local economy by selling food, but not enough revenue is generated to afford maintenance costs, and the rooftop provides only one job to a garden manager.

Environmentally the site reduces runoff by utilizing an otherwise impervious roof. It also provides habitat for pollinators, but does not reduce CO<sub>2</sub> because the roof does not accommodate perennials or trees. The site also does not reduce vehicle miles traveled (ASLA, 2012).

# UC Davis Olive Center



Olive trees on UC Davis campus  
Image 2.26

# UC Davis Olive Center

**Site elements:** The UC Davis Olive Center began as a way to manage the olive trees planted for landscape purposes throughout the UC Davis campus, especially on Russell Blvd. The fallen fruit had become a hazard along the bike path and related legal fees were costing the university around \$60,000 per a year. In 2004 they began picking the olives and since, there have been no olive related legal fees. There are around 400 olive trees harvested throughout the UC Davis campus, and the program has been so successful the olive center just planted an eight acre olive grove. Because the Olive Center is part of UC Davis they also perform research and outreach with the industry. The team includes Executive Director Dan Flynn, Assistant Director, Research Director, and a consultant. They also utilize staff from other campus departments, and for the harvest process hire a picker and a traffic controller. The olive center is designed for both research and profit.

**Needs met:** This site does not address as many social needs as many of the other sites. The center does improve campus aesthetics by keeping the olives harvested and maintained, and is publically accessible. The only classes the Olive Center offers are for industry professionals, although it hopes to begin providing classes for undergrads as well. The olive oil product does not increase access to food, improve citizen's health, or build community.

The Olive Center does meet economic needs. It provides jobs, generates more than enough revenue to cover maintenance costs, and stimulates a local economy.

Environmentally this product and site do not reduce vehicle miles traveled nor do they improve soil quality or reduce runoff. The olive trees do reduce CO<sub>2</sub>, especially because they are mature. They also provide habitat (Flynn, 2012; UC Davis, 2010).

# Urban Adamah



Aerial view of Urban Adamah before and after.  
Image 2.27



Urban Adamah  
Image 2.28

# Urban Adamah

**Site elements:** Urban Adamah is a 43,560 sq. ft. site in Berkeley, CA. Urban Adamah, founded June 2010, was designed with tents and planters to be temporary and utilize empty lots prior to development. The first and current lot is owned by Wareham Development LLC and is donated to Urban Adamah on a yearly basis. The site is run and maintained by Executive Director Adam Berman, Director of Education and Community Outreach, Farm Manager, Business Manager, Program Coordinator, Program Associate, two Farm Educators, and a Farm Mentor, for the purpose of providing a Jewish fellowship program. Jewish fellows are young adults that spend three months working at the farm and completing leadership training. The food that is not used to feed the fellows gets donated to low income farmers markets and homeless shelters in the area. The site includes planting beds, greenhouses, chickens, bees, and teaching tents.

**Needs met:** Urban Adamah provides public access during business hours and educates students and fellows as well as holding classes for the public. They donated 3,000 pounds of produce in the first six months and this increased access to food improves citizen's health. The classes and food donation programs also build community. The main fault is that from outside the site it is not aesthetically pleasing.

Economically the site provides ten jobs and job training for the fellows. Little is done to stimulate a local economy and the farm could not support itself without donations.

Urban Adamah reuses burlap bags and pallets to create planting beds, which reduce runoff. Urban Adamah also provides habitat for pollinators, but cannot have trees to reduce CO<sub>2</sub> because the site is temporary. The site also does little to reduce vehicle miles traveled (Urban Adamah, 2012).

# Guidelines

The most successful sites, which met at least nine needs are:

- City Farmers Demonstration Garden
- Eagle Street Rooftop
- UC Davis Ecological Garden
- Garden for the Environment
- The Rooftop Haven for Urban Agriculture.

City Farmer's Demonstration Garden  
Image 2.29



Eagle Street Rooftop Farm  
Image 2.30



Ecological Garden  
Image 2.31



Garden for the Environment  
Image 2.32



Rooftop Haven for Urban Agriculture  
Image 2.33

# Guidelines

## **Common Elements**

All the successful sites have a strong volunteer base, the primary purpose for City Farmers Demonstration Garden, The Rooftop Haven for Urban Agriculture, UC Davis Ecological Garden, and Garden for the Environment is to provide an education. Eagle Street Rooftop Farm's main goal is both profit and education. The successful site's common features, aside from annual crops were native/pollinator plants, and a composting area.

## **Common Needs**

Interestingly, the successful sites also met many of the same needs. All of the sites were aesthetically beautiful, provided an education, improved community health, and created a sense of community. They also all utilized urban waste, improved the soil and reduced water, and they all provided habitat for pollinators.

# Results

Based on these common elements and needs, when designing an urban agriculture site it is important to include:

- ***Demonstration or education area:*** although not all the sites which met the educational need had an outdoor classroom or demonstration area, including this type of space encourages and makes it easier to have classes, workshops, and demonstrations on site.
- ***Space for Community Gathering:*** Communities can be formed without a designated gathering area, but including a common area creates an inviting community space and a convenient space for volunteers to gather.
- ***Composting Center:*** Every successful site had an area for composting where the waste was either generated on site or from the neighborhood. The compost is then used in the gardens to improve soil quality. The application of compost and improved soil quality increases the productivity of the farm. Different types of composting are used in the case studies, but the most common is aerobic composting, which generally requires only a few bins.
- ***Plants to Attract Pollinators:*** Each of the successful sites included either a dedicated pollinator area or a native plant area. These can be farm borders, integrated into the ends of crop rows, or a designated area.
- ***Aesthetics:*** Creating an aesthetically beautiful site is important for the acceptance of the site, the amount of volunteers a site receives and the amount of community activity on the site. Designing a beautiful site involves paying attention to how the site looks both from within the farm and from the street/border of the site. Special consideration should be applied to highly visible points in the site (for example entrances, corners, line of sight).



# Results



City Farmer's Demonstration Garden  
Educational area  
Image 2.34



Urban Adamah  
Gathering space  
Image 2.35



Garden for the Environment  
Composting  
Image 2.36

Ecological Garden  
Butterfly Garden  
Image 2.37





# Conclusion

Urban Agriculture is a necessary part of future landscapes. Professional designers must develop the skillset to implement this change. Urban agriculture is an indispensable, sustainable part of our food systems and designers are in a prime position to implement the development of urban agriculture. The common elements of successful urban agriculture sites suggest that designers should include a demonstration or education area, space for community gathering, a composting center, and plants to attract pollinators. This will facilitate appreciated, multifunctional sites that address the needs of the users and community at large. Designers can use urban agriculture to meet the social, economic and environmental needs of the community and expand their roll to change society.



# References

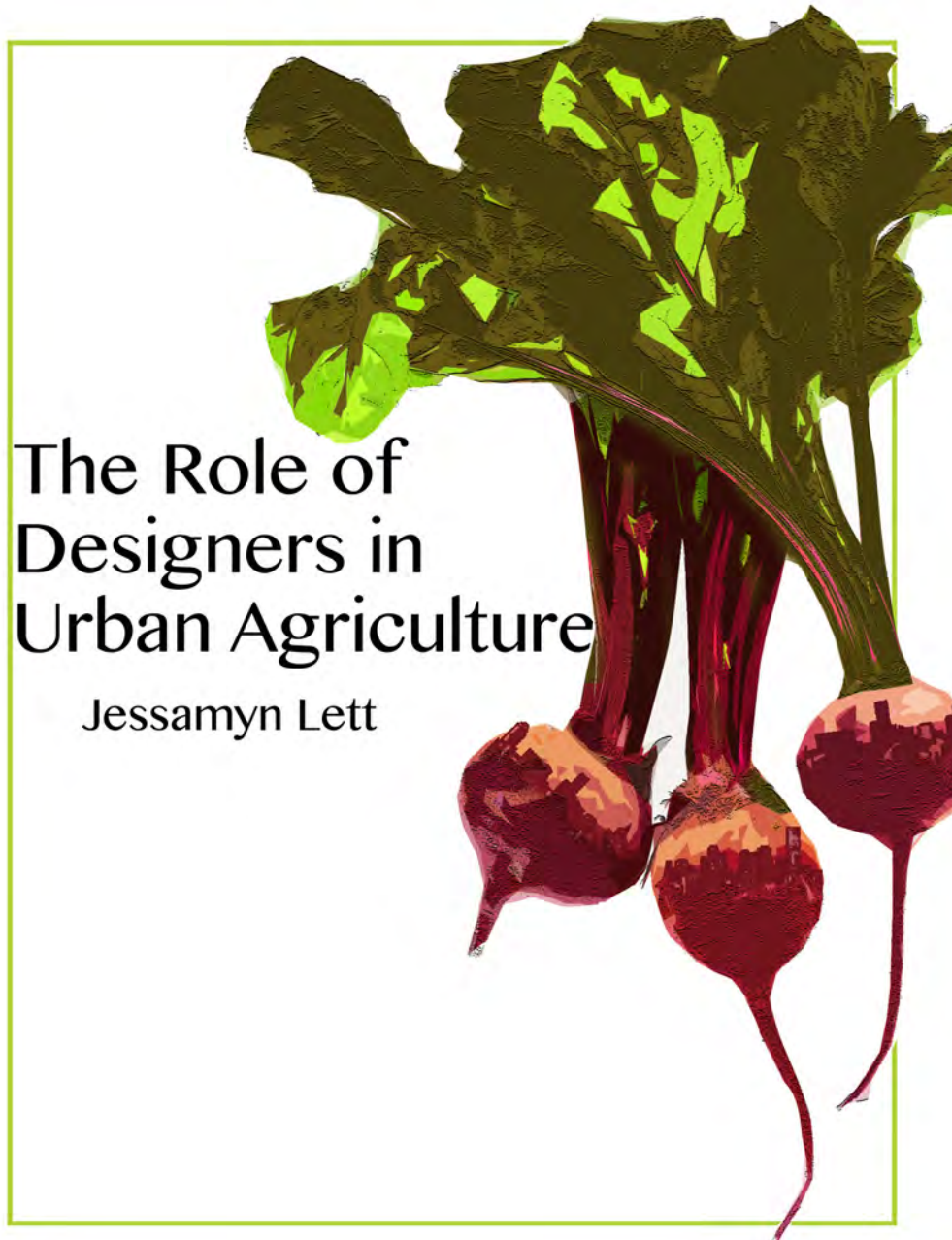
- Architekturzentrum Wien. (2012). *Hands On Urbanism*. Retrieved from: [http://www.azw.at/page.php?node\\_id=3&page\\_id=744&lang\\_id=en](http://www.azw.at/page.php?node_id=3&page_id=744&lang_id=en)
- Arid Land Homesteaders League. (2012). *Three Sisters Planting*. Retrieved from: <http://plantfreak.wordpress.com/2012/03/02/the-three-sisters-garden-corn-beans-squash/>
- ASLA. (2010). *ASLA Professional Awards: Rooftop Haven for Urban Agriculture*. Retrieved from: <http://www.asla.org/2010awards/377.html>
- Bailey, Marilee. (2012). *May with Grandchildren*.
- Brooke, Caitlyn. (2012). *Little City Gardens*. Retrieved from: <http://www.littlecitygardens.com/about/>
- Brooklyn Botanic Garden. (2011). *Edible Gardens*. Ed. Elizabeth Peters. Brooklyn, NY: Brooklyn Botanic Garden Press.
- Burke, Ellen. (2010). *Bracket: Farm Plus*.
- Carpenter, Novella. (2009). *Farm City: The Education of an Urban Farmer*. New York: Penguin.
- Carpenter, Novella, and Willow Rosenthal. (2012). *The Essential Urban Farmer*. New York: Penguin.
- Chapa, Jorge. (2008). *Work Architecture Greenroof Wins PS1Design Competition*. Retrieved from: <http://inhabitat.com/green-roof-by-work-architecture-at-ps1/>
- City Farmer. (2012). *Vancouver's Compost Demonstration Garden*. Retrieved from: <http://www.cityfarmer.org/CompostGarden150.pdf>
- City of Davis. (2012). *Davis Community Garden*. Retrieved from: <http://cityofdavis.org/cs/garden/index.cfm>
- City Slicker Farms. (2010). *Annual Report*. Retrieved from: ([http://www.cityslickerfarms.org/sites/default/files/cityslickerfarms\\_annualreport2010.pdf](http://www.cityslickerfarms.org/sites/default/files/cityslickerfarms_annualreport2010.pdf)).
- Clean Air Gardening. (2011). *Trees and your Environment*. Retrieved from: <http://www.cleanairgardening.com/plantingtrees.html>
- Cockrall-King, Jennifer. (2012). *Food and the City: Urban Agriculture and the New Food Revolution*. Amherst, NY: Prometheus.
- Commission on Environment and Development. (1987). *Report of the World Commission on Environment and Development: Our Common Future*. Retrieved from: <http://www.un-documents.net/wced-ocf.htm>

- Deelstra et al. (2001). *Multifunctional Land Use: An Opportunity for Promoting Urban Agriculture in Europe*. Urban Agriculture Magazine. Retrieved from: <http://faculty.ksu.edu.sa/ewais/Urban%20Design%20%20Land%20Use%20Researches/Multifunction%20Land%20Use.pdf>
- Eagle Street Rooftop Farm. (2010). *Albums*. Retrieved from: <https://www.facebook.com/photo.php?fbid=124645900905347&set=a.110448052325132.6299.105973792772558&type=3&theater>
- Eagle Street Rooftop Farms. (2012). Eagle Street Rooftop Farms. Retrieved from: <http://rooftopfarms.org/>
- Eilperine, Juliet. (2006). *Pollinators Decline Called Threat to Crops*. Washington Post. Retrieved from: <http://www.washingtonpost.com/wp-dyn/content/article/2006/10/18/AR2006101801712.html>
- ELSEE. (2010). *Environmental Laboratory for Sustainable and Environmental Education*. Retrieved from <http://elsee-gardens.org/index.htm>
- EPA. (2012). *Education and the Environment Initiative Home Page*. Retrieved from: <http://www.calepa.ca.gov/Education/EEI/Phases/Default.htm>
- Experimental College. (2012) *Experimental College Garden*. Retrieved from: ([http://ecollege.ucdavis.edu/index.cfm?page=Pubs&Pub\\_id=102](http://ecollege.ucdavis.edu/index.cfm?page=Pubs&Pub_id=102))
- Flynn, Dan. (2012). Personal Communication – Interview
- Garden for the Environment Facebook. (2010) *Garden for the Environment – Albums*. Retrieved from: <https://www.facebook.com/pages/Garden-for-the-Environment/127954183083>
- Garden for the Environment. (2012). *Garden for the Environment*. Retrieved from: <http://www.gardenfortheenvironment.org/>
- Gilcrest, Jack, Lora Martens, and Mary Estes. (2012). *Schedule for ASLA Annual Meeting and Expo*, Phoenix.
- Google Maps. (2011). Davis Community Garden
- Gorgolewski, Mark, June Komisar, and Joe Nasr. (2012). *Carrot City: Creating Places for Urban Agriculture*. New York: Monacelli.
- Hatchell, Susan. (2012). *UC Davis Professionals Dinner*. Lecture at UC Davis. <http://lda.ucdavis.edu/LDA2012professionalsdinner.mp4>
- Hester, Randy. (2006). Chapter on “Centeredness” from *Design for Ecological Democracy*. Cambridge: MIT Press.
- Hillhouse, Carol. (2012). Personal Communication – E-mail.
- Hodgson, Kimberley, Marcia Caton. Campbell, and Martin Bailkey. (2011). *Urban Agriculture: Growing Healthy, Sustainable Places*. Chicago, IL: American Planning Association.

- Hoerr Schaudt. (2012). *Rooftop Haven for Urban Agriculture Gallery*. Retrieved from: <http://architypereview.com/20-landscape-architecture-/projects/584-rooftop-haven-for-urban-agriculture/description>
- Indiebound. (2008). *Why Shop Indie?*. Retrieved from: <http://www.indiebound.org/>
- Jackson, Richard. (2012). *Designing Healthy Communities*. Retrieved from: <http://designinghealthycommunities.org/>
- Johnson, Lorraine. (2010) *City Farmer*. Vancouver: Greystone.
- Kendall, Alissa. (2012). *Lecture 7: Transportation*. UC Davis, ECI123
- Koc, Mustafa. (1999). *For Hunger-proof Cities: Sustainable Urban Food Systems*. Ottawa: International Development Research Centre.
- Kourik, Robert, and Mark Kane. (1986). *Designing and Maintaining Your Edible Landscape Naturally*. Santa Rosa, CA: Metamorphic.
- Lanterman, John. (2012). Personal Communication. Interview. See appendix B.
- Levenston, Michael. (1980). *Arable Acres within City Limits*. City Farmer News. Retrieved from: <http://www.cityfarmer.org/arable65.html>
- Levenston, Michael. (2010) *Gallery*. Retrieved from: <http://gallery.me.com/cityfarmer#gallery>
- Levenston, Michael. (2012). Personal Communication. Interview. See appendix B.
- Little City Gardens Facebook. (2012) *Little City Gardens – Albums*. Retrieved from: <https://www.facebook.com/pages/little-city-gardens/233506446093>
- Martino, Steve. (2012). Personal Communication. Email.
- Middlebrook, Alrie. (2012). Personal Communication. Interview. See appendix B.
- MRSC. (2012). *Urban Agriculture-Community Gardening*. Municipal Resources and Service Center of Washington. Retrieved from: <http://www.mrsc.org/subjects/parks/comgarden.aspx#food>
- Napawan, Claire. (2012). *UC Davis LDA190 lecture: My [Napawan's] research*.
- Napawan, Claire. (Not yet published). *Multi-Functional Space: Evaluating Urban Farms as Public Open Space*.
- New York Tribune. (1915). *Patri is Making Ash Heaps Blossom as the Rose*. Retrieved from: <http://www.cityfarmer.org/Patri1915sm.jpg>
- Ornamental Tree Nursery. (2010) *A guide to Ready Trained Trees*. Retrieved from: <http://ornamentaltreenurseries.blogspot.com/2010/08/guide-to-ready-trained-trees.html>
- Rathcke, B.J., and E.S. Jules. (1993). *Habitat fragmentation and plant-pollinator interactions*. *Current Science* 65(3): 273–277.

- Rogers, Walter. (2011). *The Professional Practice of Landscape Architecture: A Complete Guide to Starting and Running Your Own Firm*. Hoboken, NJ: Wiley.
- Ruiter, Paul. (2008) *De Zuidkas*. <http://www.dezuidkas.nl/en/1.php>
- Schafer-Kramer, Jane. (2012). Personal Communication. E-mail
- Terra Nova Ecological Landscaping. (2011). *Urbanite the Up Side of Upcycling*. Retrieved from: <http://www.terranovalandscaping.com/blog/2011/12/21/urbanite-the-upside-of-up-cycling-2/>
- Tracey, David. (2011). *Urban Agriculture: Ideas and Designs for the New Food Revolution*. Gabriola, B.C.
- UC Davis. (2010). *Campus Grown: Olives Home*. Retrieved from: <http://campusgrown.ucdavis.edu/olives/index.html>
- UNDP with ed. Cheema, G. Shabbir., Jac Smit, Annu Ratta, and Joe Nasr. (1996). *Urban Agriculture: Food, Jobs and Sustainable Cities*. New York, NY: United Nations Development Programme
- Urban Adamah. (2012). *Urban Adamah*. Retrieved from: <http://urbanadamah.org/>
- Uribe, Jason. (2012). *Harvesting for Spring Salad*. Retrieved from: <http://edibleschoolyard.org/esy-berkeley/journal>
- WesHardaker and Jefftolentino. (2007). *Davis Community Garden*. Retrieved from: [http://daviswiki.org/Davis\\_Community\\_Garden](http://daviswiki.org/Davis_Community_Garden)







# Final Product - Appendix A

## Population Increase and Changes in Land Use



*ELSEE Future Site Plan  
(Middlebrook Gardens, 2012)*



*Rooftop Haven for Urban Farming  
(Levenston, 2010)*

**Land uses are changing** and urban agriculture is a vital part of that shift. The US Census projects that in less than 50 years the population of the United States will surpass 400 million people and that 80% of those people will be living in metropolitan areas. The food system is failing to meet the needs of the growing population. In the United States 50.2 million people, that is 15% of the population, aren't getting enough to eat. People are underfed not because of the volume of global food production, but because of cost and distribution. To create a food system where food is accessible the production of food will have to become localized (Cockrall-King, 2012), which requires urban agriculture.

Urban agriculture is already a requirement to feed a growing urban population. The United Nations Development Programme (UNDP) (1996) sums up the economic importance of urban agriculture in 'Urban Agriculture: Food, Jobs and Sustainable Cities'. They explain that **urban agriculture is currently a significant economic activity** that is undervalued due to its difficulty in being traced because many of its products are traded in unofficial markets. Urban agriculture is a rapidly growing industry. Johnson (2010) adds that worldwide over 100 million people derive direct income from urban agriculture and urban farms produce around 35% of fresh food consumed in the United States. The growing sector of urban agriculture will increase the demand for designers.

---

The Role of Designers in Urban Agriculture

# Final Product - Appendix A



This paper defines urban agriculture as:

A farm where:

- Sourcing of materials and the actual farming must occur in an urban setting.
- One of the farmer's intents is to produce a food product.
- The farm increases the urban boundary's net sustainability.

*This definition is not meant to exclude farmers who function at other scales or with other goals, but creates a set of parameters for this piece.*



*Ecological Gardens  
(Lutz, 2012)*

# Final Product - Appendix A

## Why Should Designers Care?

### Urban Agriculture is in the Realm of Designers

Urban agriculture is happening on sites that are traditionally the landscape architect/landscape designer's realm such as:

**Parks**

**Corporate and government grounds**

**Streetscapes**

**Yards and empty lots**

All of these sites are being used for urban agriculture (Gorgolewski et. al, 2011). It is vital to provide for clients a knowledge and understanding of urban agriculture. Susan Hatchell, ASLA president, framed the issue succinctly when she said, "Landscape Architects will need to incorporate [urban agriculture] into our urban fabric" (2012).



*Middlesbrough Urban Farming Growing Sites  
Highlights urban agriculture sites.  
(Commission for Architecture and the Built Environment,  
2011)*

### Urban Agriculture is Popular

Clients desire urban agriculture. Urban agriculture will be discussed by Jack Gilcrest, Lora Martens, and Mary Estes at the ASLA 2012 meeting and EXPO because, "the concept of urban agriculture is becoming increasingly popular as people strive to create more productive and sustainable landscapes" and Steve Martino, FASLA has highlighted this lecture because, "As in most cities, urban agriculture is gaining a foothold" (2012). Urban agriculture is an up and coming field and designers who are comfortable using urban agriculture will thrive.



*Eagle Street Rooftop Farms  
Volunteers and staff working on the farm.  
(Eagle Street Rooftop Farms Facebook, 2010)*

# Final Product - Appendix A

## Urban Agriculture Needs Designers to Thrive

Professional designers have the design skill, experience, and standing to insure successful urban farms. Kourik, author of 'Designing and Maintaining your Edible Landscape Naturally' (1986), explains that although function and not composition should be the leading motivator in making the landscape, still he finds "My own [edible] designs, done by instinct, often match the guidelines of landscape architecture". He goes on to explain how form, color, texture and other "classic components" of landscape architecture are necessary to successfully incorporate food into the landscape. The designer's ability to create aesthetically pleasing, site appropriate, and functional sites promotes the acceptance of urban agriculture.

Designers also understand how to analyze site context and work with clients to implement appropriate land uses. Understanding the context of a site and how it impacts the use of a site is a skill designers have developed.

Landscape architects in particular have the added benefit of having experience and standing with the government. Landscape architects can sign legal documents and they know the process of getting a design approved. The majority of urban farmers in the United States are younger and less experienced and the task of drawing and submitting plans may prove to be their downfall (Burke, 2012). Landscape architects have invaluable experience that will allow urban farmers the chance to farm.



*WORK architects Public Farm 1 - A well-designed and well received urban leisure space (Chapa, 2008)*

# Final Product - Appendix A

## Urban Agriculture Meets the Goals of Designers

Urban agriculture is an ideal tool for landscape architects and professional landscape designers because it adds key elements that help create a successful space.

**Urban agriculture:**  
Engages communities  
Is environmentally responsible  
Is economically sound  
Creates a culturally aware population



*De Zuidkas by Paul de Ruiter Architects  
(Rوتر, 2008)*

### Urban agriculture engages communities

The act of maintaining plants has the ability to bring people from very different backgrounds and situations together. Randy Hester, author of 'Design for Ecological Democracy,' refers to the community aspect of the landscape experience as centeredness. Centeredness is the "aggregate of shared experiences, activities, and interests and of associated settings". Hester explains that for individuals to become communities the landscape architect must have settings that "draw them together for face-to-face civic engagement". (2006). Urban agriculture provides an excellent opportunity for this engagement and offers many stories of creating community and uniting neighborhoods (MRSC, 2012). Urban agriculture increases the sense of community by creating resilience in communities, creating mutual trust, sharing, and friendship, and encouraging an 'eyes on the street' community where neighbors watch out for each other (Hodgson, 2011).

# Final Product - Appendix A

## Urban agriculture is environmentally responsible

Urban agriculture processes urban waste and produces more food per acre than industrial farms. Urban agriculture uses urban wastes such as food waste and urbanite (recycled, reclaimed, broken-up concrete) (Carpenter, 2009). UC Davis Assistant Professor, Claire Napawan found that in San Francisco the urban farms were able to process 0.3% of compostable waste, while only consuming 0.03% of the land (2012). Urbanite is used in a variety of urban farms to create raised beds, terracing, and so forth. Similar found materials, such as old wood, doors, windows, and pieces of metal are also used to create elements in urban farms. This reduces a city's waste and increases the functionality of a farm (Carpenter, 2011).

Industrial farms are large, corporation-based, mono-crop farms that currently make up the majority of farms in the United States. The yield from one acre of an urban farm is often much higher than the yield from one acre of a factory farm land (Cockrall-King, 2012) because urban farms have more people working the land and are more diversely planted (Johnson, 2011).



*Garden for the Environment - urbanite planter.  
(Iversen, 2007)*



*UC Davis Ecological Garden -vermicomposting  
(Lett, 2012)*



*Tricycle Gardens HQ - reused window greenhouse.  
(Tricycle Gardens, 2011)*



# Final Product - Appendix A

## Urban agriculture makes economic sense

Urban agriculture is a moneymaking enterprise. There are successful for profit models, such as the SPIN (small plot intensive) model (Johnson, 2011) and the CSA based model, such as Appleton Farms (Burke, 2012). Urban agriculture can also be used to offset maintenance costs (Lanterman, 2012). Producing enough to cover maintenance costs is attainable even for integrated urban agriculture, such as street trees (Flynn, 2012).

On a global scale urban agriculture is the economically responsible choice because it requires less petroleum inputs than the typical industrial farm. Farms consume 16-17% of total energy consumption in the United States and require petroleum in fertilizer production, pesticide production, tractor use, shipping and storage. The rising costs of petroleum make factory farm less feasible. Urban agriculture can reduce or remove petroleum use in food production by reducing food miles and inputs (Cockrall-King, 2012).

## Urban agriculture is a forum to express and share cultures

Urban agriculture allows people to grow culturally significant food and cultivate traditional garden forms, which connect them to their histories (Brooklyn Botanic Gardens, 2011). Cultural food and forms can be shared with the community, increasing awareness and acceptance. Carpenter exemplifies this process when she grows traditional foods from many of her neighbors' cultures and shares them (2009).

Shared gardening and food becomes a vector for the development of a unique local culture. Urban agriculture recreates a lost sense of culture by combining old traditions with a sense of place and the seasons (Johnson, 2010).



*Three Sisters Planting - Traditional Native American companion planting of corn, beans, and squash (Arid Land Homesteaders League, 2012)*

# Final Product - Appendix A

## Sustainability

For many cities, urban agriculture is an excellent step toward meeting sustainability goals. Not only because urban agriculture improves the sustainability of a city, but because it is a very visible and beautiful way to impact a city. Sustainability requires environmental, social, and economic strength, but also a knowledge and visibility that allows it to be used a tool for a city.



*ELSEE Site  
Chapparal microclimate with reused hardscape  
(ELSEE, 2010)*

In 'The Original Green', author Stephan Mouzon (2010) lists "The top ten better ways of being green" where he uses the term green as a synonym for sustainability. This list of principles creates the foundation for a sustainable future. Although urban agriculture can address the entire list, four ways of being green closely connect to the goals that urban agriculture can help landscape architects achieve.

1. **The involvement of everyone** is very similar to the concept of creating a community. Everyone must participate to change the business as usual model into a sustainable model and urban agriculture invites and encourages everyone to work together as a community.
2. **The source of stuff** refers to the importance of producing near users, so transportation and storage are not the energy sinks they currently are. Urban agriculture moves production of fresh fruits and vegetables into the city and often times into consumer's backyards.
3. **The simpler way** is an economic model that ensures that the fewest inputs are used. This is true of urban agriculture, because it is easier and more logical to produce food where workers are abundant to replace the use of fertilizer, pesticide, and tractors.
4. **The sharing of wisdom** is passing on and spreading ideas that work in the local context. Diversity and cultural awareness brought on by urban agriculture allows successful traditions and newly discovered knowledge to be spread.

# Final Product - Appendix A

## Case Studies and Guidelines

The purpose of analyzing case studies is to form guidelines that designers can follow to create successful urban agriculture sites. The guidelines are based on common elements and features in successful urban agriculture sites. For the purposes of this project a successful urban agriculture site is able to address the most needs. To determine the most important site elements, ten case studies were completed. Each site was analyzed for their ability to meet a matrix of needs, which were looked at as markers of success. A successful urban agriculture site should address at least nine of the following needs, at least one from each category of Social, Environmental, and Economic.

Important site elements were identified prior to the identification of the most successful sites based on Mark Francis's case study method for landscape architects. Additional elements were determined based on Claire Napawan's paper 'Multi-Functional Space: Evaluating Urban Farms as Public Open Space' (Not yet published). The last step in creating the site elements was a consideration of what the farmers considered

### **Social:**

- Aesthetically pleasing site
- Provide public open space
- Educate users
- Increase access to fresh food
- Improve citizen's health
- Community building

### **Economic:**

- Provide jobs
- Afford maintenance costs
- Stimulate a local economy

### **Environmental:**

- Reduce vehicle miles traveled
- Use urban waste, improve soil quality and reduce runoff
- Fix CO2
- Provide habitat

Based on this analysis the complete list of elements analyzed for each site includes:

- Site location
- Site size
- Founded in
- Integration into site
- Visibility
- Owner
- User
- Purpose
- Designer
- Features
- For profit

# Final Product - Appendix A

## Case Studies

**City Farmer's Demonstration Garden** is a 2,500 sq. ft. site in Vancouver, B.C. that began in 1982 to educate residents of Vancouver about how to grow food, compost, and so forth. The garden features a food garden, water wise plant garden, ability garden, compost, 'green' cob buildings and green roofs, natural lawn care, and technologies.

This site meets all social and environmental needs, and is able to provide jobs, but does not fund itself based on produce sales or stimulate a local economy (City Farmer, 2012).



*City Farmer's Demonstration Garden  
(Lerenston, 2010)*

**The Davis Community Garden** is a 60,000 sq. ft. site in Davis, CA. The site is owned and maintained by the City of Davis Community Services Department. Individuals rent 116 plots. The purpose of the community garden is to provide a positive gardening experience in productively used garden plots. The garden features rentable plots, a garden center, an herb plot, a perennial plot, and a donation garden.

Although this site has some social and environmental benefits, it does not meet any economic needs, thus cannot be considered successful (City of Davis, 2012).



*Davis Community Garden Aerial Photo  
(Google Earth, 2011)*

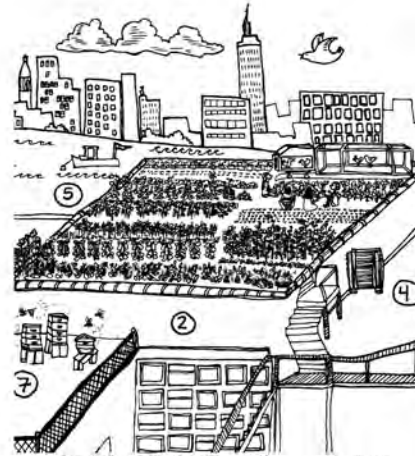
# Final Product - Appendix A

**Eagle Street Rooftop Farm** is a 6,000 sq. ft. green roof in Brooklyn, NY. It first opened in April 2009 on the roof of Broadway Stages, a local company who decided to hire Goode Green Green roof Design and Installation to design and construct a rooftop farm. The farm was constructed for the green roof benefits and to produce a profit.

This site has limited public access but addresses many social needs. It meets all the economic needs, and the environmental needs of reducing runoff and providing habitat (Eagle Street Rooftop Farms, 2012).

**UC Davis's Ecological Garden** is a 1.2 acre farm started in 1980. The site has UC Davis student interns and volunteers and holds educational tours for grade school children. The site has evolved with the input of many students and staff and now includes compost, annuals, perennials, fruit trees, and chickens.

This site meets most social needs, but the only economic needs it meets is providing a job. It does address most environmental needs as well (Hillhouse, 2012).



*Eagle Street Rooftop Farm- Axonometric sketch  
(Eagle Street Rooftop Farm, 2012)*



*Ecological Garden Basemap  
(Hillhouse, 2012).*

# Final Product - Appendix A

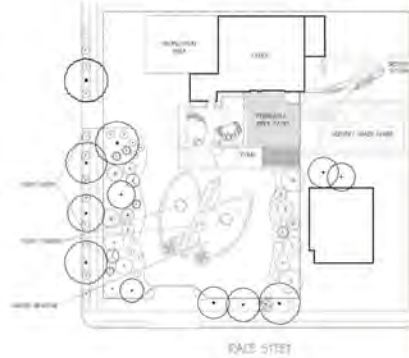
## **The Environmental Laboratory for Sustainability and Ecological Education**

(ELSEE) is a 0.4 acre site in San Jose, CA. It is designed and run by Alrie Middlebrook, Landscape Designer, to incorporate native edibles into the school curriculum and is developing technology for school gardens nationally. This site is a test site for the Sustainable Sites Initiative.

This site meets many social needs and stimulates a local economy. It also addresses environmental needs. The site's plants are mostly natives, which provide habitat (ELSEE, 2010 and Middlebrook, 2012).

**The Garden for the Environment** is a 21,780 sq. ft. site in San Francisco, CA on San Francisco Public Utilities Commission land. It has visually permeable planted borders and multiple entrances. The purpose is to promote efficient water management, composting education, and donate food.

The Garden for the Environment meets all the social needs, most the environmental needs and provides jobs (Garden for the Environment, 2012).



*ELSEE Site - Base Map  
(ELSEE, 2010)*



*Garden for the Environment - demonstration  
(Garden for the Environment, 2012)*

# Final Product - Appendix A

**Little City Gardens** is a 43,560 sq. ft. site in San Francisco, CA. This site began in 2008 as an empty lot. This is a for profit farm that produces mostly salad greens as well as some flowers and sells CSA boxes, has a booth at the farmers market, and sells to restaurants. The site has low visibility because it is fenced in, but it is popular amongst the neighbors.

This site addresses few social needs. It does address all the economic needs, and some of the environmental needs (Brooke, 2012).



*Little City Gardens - Planting  
(Brooke, 2012)*

**The Rooftop Haven for Urban Agriculture** is an 8000 sq. ft. rooftop the Gary Comer Youth Center in Chicago, IL. This is a celebrated site designed by Hoerr Schaudt Landscape Architects as an educational tool for the youth center. The farm includes graphic and striking skylights, annuals, and flowers.

This site meets all social needs, but only meets the economic need to stimulate a local economy. It also addresses the environmental needs of reducing runoff and providing habiat (ASLA, 2010).



*Rooftop Haven for Urban Agriculture  
(ASLA, 2010)*

# Final Product - Appendix A

The **UC Davis Olive Center** began as a way to manage the olive trees planted for landscape purposes throughout the UC Davis campus. They harvest olives as a way to fund maintenance and offset legal costs as well as complete research and industry training. Around 400 trees are harvested from throughout the UC Davis campus.

This program does not address many social needs because of its focus on industry and research. It does meet some of the economic needs and the trees provide habitat (Flynn, 2012).

**Urban Adamah** is a temporary planter based site in Berkeley, CA. This site is fenced off and tended to by staff and Jewish Fellows. This site is used for education and all the extra produce is donated. This site was not designed professionally, although input from landscape architecture students was considered.

This site addresses many social needs and economically provides both jobs and job training. The site is environmentally beneficial, but its temporary status limits the CO2 reduction benefits (Urban Adamah, 2011).



*UC Davis Olive Trees- Harvested by Olive Center (UC Davis, 2010)*



*Urban Adamah - before and after (Urban Adamah, 2011)*



# Final Product - Appendix A

## Assessing the Sites

After looking at each site this report assessed how well they met a variety of needs

Sites	Totals	Social Needs					
		Aesthetics	Open Space	Education	Access	Health	Community
City Farmer's Demonstration...	11	Yes	Yes	Yes	Yes	Yes	Yes
Davis Community Garden	4	No	No	No	Yes	Yes	Yes
Eagle Street Rooftop Farm	10	Yes	No	Yes	No	Yes	Yes
Ecological Garden	9	Yes	Yes	Yes	No	Yes	Yes
ELSEE	8	Yes	No	Yes	No	Yes	Yes
Garden for the Environment	10	Yes	Yes	Yes	Yes	Yes	Yes
Little City Garden	6	Yes	No	No	No	No	Yes
Rooftop Haven for Urban ...	9	Yes	Yes	Yes	Yes	Yes	Yes
UC Davis Olive Center	6	Yes	Yes	No	No	No	No
Urban Adamah	8	No	Yes	Yes	Yes	Yes	Yes

	Economic Needs			Environmental Needs			
	Jobs	Maintain	Local Econ	VMT	Waste	CO2	Habitat
City Farmer's Demonstration...	Yes	No	No	Yes	Yes	Yes	Yes
Davis Community Garden	No	No	No	No	Yes	No	No
Eagle Street Rooftop Farm	Yes	Yes	Yes	Yes	Yes	No	Yes
Ecological Garden	Yes	No	No	No	Yes	Yes	Yes
ELSEE	No	No	Yes	No	Yes	Yes	Yes
Garden for the Environment	Yes	No	No	No	Yes	Yes	Yes
Little City Garden	No	Yes	Yes	Yes	Yes	No	No
Rooftop Haven for Urban...	No	No	Yes	No	Yes	No	Yes
UC Davis Olive Center	Yes	Yes	Yes	No	No	Yes	No
Urban Adamah	Yes	No	No	No	Yes	No	Yes

The most successful sites were City Farmers Demonstration Garden, Eagle Street Rooftop, UC Davis Ecological Garden, Garden for the Environment, and The Rooftop Haven for Urban Agriculture.

### Common elements/features these sites had:

- Strong volunteer base
- Educational Component
- Inclusion of Natives/Pollinator Habitat

### Common needs they all met are:

- Aesthetically strong
- Provide education
- Improve communities health
- Create community
- Use urban waste/improve soil/ reduce runoff
- Provide habitat

# Final Product - Appendix A

## Guidelines

Based on these common elements and needs, when designing an urban agriculture site it is important to include:

- **Demonstration or Education Areas:** Although not all the sites which met the educational need have an outdoor classroom or demonstration area, including this type of space encourages and makes it easier to have classes, workshops, and demonstrations on site.
- **Space for Community Gathering:** Communities can be formed without a designated gathering area, but including a common area creates an inviting community space and a convenient space for volunteers to gather.



*City Farmer's Demonstration Garden  
Educational area  
(Levenston, 2010)*



*Urban Adamah  
Gathering space  
(Urban Adamah)*

# Final Product - Appendix A

## Guidelines

- **Composting Center:** Every successful site had an area for composting where the waste was either generated on site or from the neighborhood. The compost was then used in the gardens to improve soil quality. The application of compost then improved soil quality and increased the productivity of the farm. Different types of composting are used in the case studies, but the most common is aerobic composting, which generally requires only a few bins.
- **Plants to Attract Pollinators:** Each of the successful sites included either a dedicated pollinator area or a native plant area. These can be farm borders, integrated into the ends of crop rows, or a designated area.
- **Aesthetics:** Creating an aesthetically beautiful site is important for the acceptance of the site, the amount of volunteers a site receives and the amount of community activity on the site. Designing a beautiful site involves paying attention to how the site looks both from within the farm and from the street/border of the site. Special consideration should be applied to highly visible points in the site (for example entrances, corners, lines of sight).



*Garden for the Environment  
Composting  
(Garden for the Environment Facebook, 2010)*



*Ecological Garden  
Butterfly Garden  
(Lett, 2012)*

# Final Product - Appendix A

## References

- ASLA. (2010). *ASLA Professional Awards: Rooftop Haven for Urban Agriculture*. Retrieved from: <http://www.asla.org/2010awards/377.html>.
- Brooke, Caitlyn. (2012). *Little City Gardens*. Retrieved from: <http://www.littlecitygardens.com/about/>
- Brooklyn Botanic Garden. (2011). *Edible Gardens*. Ed. Elizabeth Peters. Brooklyn, NY: Brooklyn Botanic Garden Press.
- Burke, Ellen. (2010). *Bracket: Farm Plus*.
- Carpenter, Novella. (2009). *Farm City: The Education of an Urban Farmer*. New York: Penguin.
- Carpenter, Novella, and Willow Rosenthal. (2012). *The Essential Urban Farmer*. New York: Penguin.
- City Farmer. (2012). *Vancouver's Compost Demonstration Garden*. Retrieved from: <http://www.cityfarmer.org/CompostGarden150.pdf>
- City of Davis. (2012). *Davis Community Garden*. Retrieved from: <http://cityofdavis.org/es/garden/index.cfm>
- Cockrill-King, Jennifer. (2012). *Foul and the City: Urban Agriculture and the New Food Revolution*. Amherst, NY: Prometheus.
- Eagle Street Rooftop Farms. (2012). *Eagle Street Rooftop Farms*. Retrieved from: <http://rooftopfarms.org/>
- ELSEE. (2010). *Environmental Laboratory for Sustainable and Environmental Education*. Retrieved from <http://elsee-gardens.org/index.htm>
- Flynn, Dan. (2012). Personal Communication – Interview
- Garden for the Environment. (2012). *Garden for the Environment*. Retrieved from: <http://www.gardenfortheenvironment.org/>
- Gilcrest, Jack, Lora Martens, and Mary Estes. (2012). *Schedule for ASLA Annual Meeting and Expo*. Phoenix.
- Gorgolewski, Mark, June Komisar, and Joe Nasr. (2012). *Carrot City: Creating Places for Urban Agriculture*. New York: Monacelli.
- Hatchell, Susan. (2012). *UC Davis Professionals Dinner*. Lecture at UC Davis. Retrieved from: <http://lda.ucdavis.edu/LDA2012professionalsdinner.mp4>
- Hester, Randy. (2006). Chapter on “Centeredness” from *Design for Ecological Democracy*. Cambridge: MIT Press.
- Hillhouse, Carol. (2012). Personal Communication – Interview
- Hodgson, Kimberley, Marcia Caton, Campbell, and Martin Bailkey. (2011). *Urban Agriculture: Growing Healthy, Sustainable Places*. Chicago, IL: American Planning Association.
- Johnson, Lorraine. (2010) *City Farmer*. Vancouver: Greystone.
- Kourik, Robert, and Mark Kane. (1986). *Designing and Maintaining Your Edible Landscape Naturally*. Santa Rosa, CA: Metamorphic.

# Final Product - Appendix A

## References

- Lanterman, John. (2012). Personal Communication. Interview.
- Martino, Steve. (2012). Personal Communication. Email.
- Mouzon, Stephen A., and Robert Francis Kennedy. (2010). *The Original Green: Unlocking the Mystery of True Sustainability*. Miami: Guild Foundation.
- Middlebrook, Alric. (2012). Personal Communication. Interview.
- MRSC. (2012). *Urban Agriculture-Community Gardening*. Municipal Resources and Service Center of Washington. Retrieved from: <http://www.mrsc.org/subjects/parks/comgarden.aspx#food>
- Napawan, Claire. (2012). *UC Davis LDA190 lecture: My (Napawan's) research*.
- Napawan, Claire. (Not yet published). *Multi-Functional Space: Evaluating Urban Farms as Public Open Space*.
- UC Davis. (2010). *Campus Grown: Olives Home*. Retrieved from: <http://campusgrown.ucdavis.edu/olives/index.html>
- UNDP with ed. Cheema, G. Shabbir., Jac Smit, Annu Ratta, and Joe Nasr. (1996). *Urban Agriculture: Food, Jobs and Sustainable Cities*. New York, NY: United Nations Development Programme
- Urban Adamah. (2012). *Urban Adamah*. Retrieved from: <http://urbanadamah.org/>



# Interviews - Appendix B

Interviews were completed both on the phone and via e-mail. Following is the authors recording of the interviews. Phone interviews are not recorded word for word, but all content is as close as possible to the original responses. Irrelevant content was not recorded.

The interviews are included in chronological order.

John Lanterman - The Urban Agriculture Project	3-28
Michael Levenston - City Farmer	3-30
Max Cadji - Phat Beets Produce	3-32
Peter Gradjankey - Peter Gradjankey Landscape Architecture	3-34
Alrie Middlebrook - Middlebrook Gardens	3-36
Laurie Gates - UC Davis Market Garden	3-38
Dan Flynn - UC Davis Olive Center	3-41

# Interview - John Lanterman

The Urban Agriculture Project is the advocacy arm of The Planning Group, a group of landscape architects, planners, and urban designers, based in Denver, Colorado. This group hopes to reintroduce food production into the healthy and sustainable community and includes both information sharing and design and planning that incorporates urban agriculture. The interviewee, John Lanterman, is principle of The Planning Group, faculty member at University of Colorado College of Architecture and Planning, and a licensed landscape architect.

Phone interview 4/11/2012

Phone: 303-588-2310

Email: John@PlanningGroup.com

Website: <http://www.urbanagricultureproject.com/>

## ***Is The Urban Agriculture Project design or information based?***

All about review and research right now. Get people up to speed. It is a resource for designers. John and a few other people lead it, including grad students.

## ***Does the planning group design urban agriculture?***

Yes. There has been urban agriculture incorporated into residential design and some conceptual master plans, but often John brings up urban agriculture with new clients, but it is a hard sell. Developers don't want to commit.

## ***What is the main concern that developers have? Maintenance?***

No, mostly the issue is just the risk because it is a different idea. Maintenance costs are more than offset by produce profits. Can even be cheaper is incorporated from the design because can include a farm manager and build in irrigation. It becomes a source of revenue. The issue is that its something new.



# Interview - John Lanterman

## ***Why are designers important to urban agriculture?***

It is important for everyone to be involved including planners and landscape architects and horticulture people and community groups. Designers are roll models and clients look toward designers so they must set a good example. What makes urban agriculture important to designers is it is necessary for sustainability. Food production is one of the four foundations for sustainability and it impacts energy consumption.

## ***What are the designers responsibilities?***

If the site is really big- over 20 acres then need to bring in a farm manager. Denver housing authority now incorporates urban agriculture at the scale of community gardens in all their low income developments. It is key in creating a sense of community and a good tool.

## ***Does urban agriculture design process differ from other design?***

No. Just another program element. It adds another layer but makes it easier because adds a social aspect and helps create community.

# Interview - Michael Levenston

City Farmer established the Office of Urban Agriculture in 1978. It encourages urban dwellers to grow food in the city and provides resources to promote urban farming and educate urban farmers about the food growing process, compost, and other environmentally responsible practices. The interviewee is City Farmer executive director, Michael Levenston.

Phone interview 4/18/2012

Phone: 604-736-2250

E-mail: [Cityfarmer@gmail.com](mailto:Cityfarmer@gmail.com)

Website: <http://www.cityfarmer.info>

***Is this a governmental department? Could you give me a brief introduction into what city farmer does? Does it provide any design help/recommendations?***

No, it is not a governmental department. That was a joke because in the '70's something like [an government department of urban agriculture] wouldn't even be considered. We do work with the city of Vancouver to teach people about compost. We are a non-profit organization. We consist of a head gardener, two garden designers (Sherrill and Lindsey), and one agriculturalist each person works about one day a week. Some people teach at schools. They service and if someone wants help Sharon, the head gardener, helps. We have a garden, the city's compost garden. We run the garden, which involves answering questions, talking to visitors, and gardening.

# Interview - Michael Levenston

## ***What is the roll of designers in urban agriculture?***

They should get contracts for areas that have to look better - like public spaces: any visual or public community garden, prison gardens, rich people yards, rooftop gardens where they work with engineers. Landscape architects should design the trickier things.

## ***What should a designer's responsibilities be?***

They need to know everything - structure, soil, bed heights, proper wheelchair design, planning issues within a city, how to hook up water, lighting, combining urban agriculture with hardscape, choosing the proper compost, arbors.

What is the biggest issue with having landscape architects design?

They will charge more. They will need to incorporate people into their design process.

## ***Additional comments:***

I hope [designers] get more involved.

There are all sorts of projects they need professionals.

Residences would have to be rich.

# Interview - Max Cadji

Phat Beets Produce is a food justice collective. It began in 2007 as a low income produce stand and has evolved as a means to close the gap between small farmers' of color that lack market outlets and urban communities that lack access to healthy, affordable, culturally appropriate food. Phat Beets Produce aims to create a healthier, more equitable food system in North Oakland by supporting farmers markets that encourage youth leadership, connect small scale farmers to urban communities, and create urban youth market gardens. Max Cadji is one of 7 primary volunteers who run Phat Beet Produce.

Phone Interview 4/18/2012

Phone: (510) 689-3068

E-mail: [phatbeetsproduce@gmail.com](mailto:phatbeetsproduce@gmail.com)

Website: <http://www.phatbeetsproduce.org/>

## ***Does Phat Beet Produce design and build farms?***

We work with clinics mostly to put in farmers markets/farm stands and gardens. We have one major garden and we do a lot of policy stuff. Also we work with urban farmers to help provide access. The farming part is minor.

# Interview - Max Cadji

***Of the volunteers what are their professions? Rolls?***

Horticulturalist, nutritionist, medical professionals. We work with youth or farmers or the media or nutrition.

***What do you think is the roll of landscape architects in urban agriculture?***

When gardens are designed by people outside of the neighborhood it is not as good for people in the neighborhood. It is not seen as accessible and not used. The communities input is the most important thing.

***What would the responsibilities of the designers be?... to be successful?***

They must incorporate community design and input. They need to discover the needs of the users. The plans must be submitted and reviewed by the neighborhood.

***Is there a problem with people not maintaining your community/youth gardens?***

Not really, no.



# Interview - Peter Gradjankey

Peter Gradjankey is a self-employed landscape architect who works in the bay area. He owns a design-build firm and specializes in residential designs.

Phone interview 4/20/2012

Phone: (415) 699-5441

## ***What is your company called?***

Peter Gradjankey landscape architecture (designer and builder of gardens). I'm self-employed and hire any sub consultants I need and one long-term employee whom I hire when I can. I couldn't sell the company, if I were injured or something there would be an issue. It provided great flexibility when my kids growing up, but not very secure.

## ***What do you do?***

Residential gardens, I have done a schoolyard and been involved as a citizen in lots of planning. My specialty is doing thematic designs and working out details in the field. It is design-build, I love hand-work like stone walls.

## **Have you ever considered incorporating urban agriculture into your designs or suggesting it to your clients?**

I have added beds or integrated vegetables to yards. My preference for a separate area, I do not really design the vegetable bed, just where the beds go. It's a different aesthetic. The other way to go is to add vegetables to ornamental beds and they are ornamental too. Usually people have limited \$ and space. I usually encourage a modest size garden.

## ***Do you suggest including vegetables?***

I have a questionnaire that I do that includes a question about vegetable beds. Comes up in conversation quite often, i.e. this would be a great space for a vegetable bed, do you want one...

# Interview - Peter Gradjankey

## ***Do people often request vegetable garden?***

A quarter of the time, but I have a specific cliental.

## ***Is urban agriculture relevant to designers?***

Perhaps not, based on their specialty. They have to start considering it. It depends on markets and what parts of the profession they are in. If residential design you have to consider what the owner wants. The amount of food will not be significant. Planners would do well to consider green areas for recreation and for farms because efficient and because people love it. It makes sense to consider. Because of the expense some people will pay for it but right now the realities of the market make it come from elsewhere but I would love plans to be made for urban agriculture. Implementation is also about the demands on land. Lots of people will develop if they can.

## ***Are designers relevant to urban agriculture?***

I love to think I'm necessary. I think designers can create multiuse and give it a good reputation and designers can help, but its not rocket science. People can do it themselves. We need someone in the planning realm if there is going to be a big movement to help lead groups and ensure soil quality ect. Positions in bureaucracy are important on large scale.

## ***How did you start up your business?***

Got out of school. Worked in a couple of offices. I started as designer but didn't want to work in offices. I intended to be more involved in wild land restoration and large-scale things, but it was very low paying. I have also been planting director in San Francisco - friends of urban forest. I just decided to start my own firm because I knew people and am well trained as arborist. It was in early 90s too so it was boom years. Only in last three years has it been tough.

# Interview - Alrie Middlebrook

Alrie Middlebrook is the owner of the design firm Middlebrook Gardens, which specializes in residential native planting design. She is also the author of two books, *Designing California Native Gardens* and *Eating California*. She is also designer and leader of the ELSEE site in San Jose.

E-mail interview 5/1/2012

E-mail: [info@middlebrook-gardens.com](mailto:info@middlebrook-gardens.com)

Websites: <http://middlebrook-gardens.com/>      <http://elsee-gardens.org/>

***Does your design process differ when creating edible designs vs. other types of design? If so how?***

Yes, I try to include food technology as well as sustainable design elements that support urban food production to maximize space and quantity of food grown. For example a roof garden for food production as well as a native meadow, stacking function for optimum returns. If you're going to utilize technology in your design, then you have to understand how it works. For example, Structurally, Living roofs must handle wet loads; how do you create an aquaponics unit, etc.?

***What is the roll of professional designers in urban agriculture? Is it important to have professional designers vs. community groups or horticulture people involved?***

Yes, I prefer the collaborative approach. You need a horticulturist or an urban farmer, an engineer, an architect, perhaps a soils specialist, it depends on the project. The lead designer is the conductor. The client and the designer select the music, the team plays the piece under the designers interpretation and they are all a part of the audience.



# Interview - Alrie Middlebrook

***Is urban agriculture necessary for designers to understand and incorporate into their designs? Why or why not?***

Yes, urban agriculture is being reinterpreted in the 21st century. So much new technology is being developed for maximizing food production in small urban spaces that we are all in a steep learning curve to keep up with it!

Food security and food safety is enhanced by growing food in urban areas close to where more than half of the worlds population lives. Architects will design urban farms in buildings, on buildings, and under buildings!

***What is the main thing you feel is preventing the implementation of urban agriculture?***

Rich subsidized farmers who want to keep the system the way it is; industrial agricultural models trying to hold on to their wealth and the infrastructure that supports it; the farm lobby and elected officials in farm states.

# Interview - Laurie Gates

Laurie Gates changes careers to Landscape Design in 2004. She began UC Berkeley Extension's Landscape Architecture Certificate program in 2007 to focus on residential design. This fall she will graduate with a certificate in Historic Landscape Architecture. She also received her C-27 Landscaping Contractor's License in 2010 and has owned her own landscape design business, The Secret Garden Landscape Design, since 2004. Currently Laurie works at the UC Davis Student Farm as a "Farm Laborer," but her focus is on developing a native plants border and refuge area and managing the strawberries.

E-mail interview 5/8/2012

E-mail: LaurieGates1@gmail.com

***Does your design process differ when creating edible designs vs. other types of design? If so, how?***

Yes, my design process varies mainly because edible plants require so much more water. To tell you the truth, I really haven't had too much experience creating residential edible designs up to this point. I hope that changes over the next 2 years as I continue working at the Student Farm. For example, one area we are now working on is a border that has large, established fig and pomegranate trees. We are planting lavender, mint and lemon verbena near the end of the fig border. I want to use less water on these to prevent weeds, so am trying to juggle both high and low water needs. I am also adding a thick layer of chips to help prevent weeds.

***What is the roll of professional designers in urban agriculture? Is it important to have professional designers involved?***

Urban spaces are all designed, so yes absolutely, I think landscape designers with experience in agriculture will become increasingly important as more and more city infill land gets developed to become agriculturally productive. Designers can help with the transition areas between the various types of space uses, and they can also help city dwellers experience the benefits of these green space farm/gardens.

## Interview - Laurie Gates

### ***Is urban agriculture necessary for designers to understand and incorporate into their designs? Why or why not?***

Yes because if you look at the demographic trends now, people are migrating away from suburbs and back to the city cores. Because of this there is, in my opinion, going to be a large future movement to expand organic farming into urban areas. Consequently, it is highly likely that future urban planners and LA's are going to be needing to incorporate farm land into their projects on a regular basis. That is already happening in Davis with the plans for the Hunt Cannery site. Thus, the more designers know about agriculture, the better. I do think that they can't know a great deal yet about "urban agriculture" because this field is really emerging in a new, different and significant way right now.

### ***What is the main thing you feel is preventing the implementation of urban agriculture?***

What has been preventing the implementation right now is everyone is used to the same paradigm of the way it used to be i.e. farms were mainly outside city limits. But everything is changing (see question #3), and change takes time. For example: the City of Davis Natural Resources Commission has been working for the last 3-4 years trying to set up a land sharing agreement so small organic farmers can come in and use unused city infill land for agriculture. All that takes time to do studies, get consults, go before the city council, etc. Now, things are going to be actually going into gear with the new Farm Start-Up program at the Center for Land Based Learning. My understanding is that grads of that pro-gram are going to be able to work with the City of Davis and be the ones considered for these local in-city farm sites. You have not heard about all this, it might be helpful for your project to look into it.



# Interview - Dan Flynn

The UC Davis Olive Center is an on-campus program that harvests olive street trees from throughout the UC Davis campus and produces olive oil. The Olive Center also researches olive oil and olive oil production and works with the industry to promote education. Dan Flynn is the Executive Director of the Olive Center.

Phone interview 5/28/2012

Phone: (530) 752-5170

E-mail: jdflynn@ucdavis.edu

Website: <http://olivecenter.ucdavis.edu/>

## ***How did the university get started harvesting olives?***

The olives on Russell created a slipping hazard on the bike path. In 2004 it was costing the university \$60,000 in legal fees. The solution was to pick the olives. Since 2004 there have been no legal costs due to olive hazards.

## ***Is the olive center making a profit?***

Its difficult to turn a profit because the form of the trees makes harvesting inefficient. Also to harvest along Russell a traffic controller is necessary. We support ourselves because producers donate oil, we perform research, and we provide courses to industry professionals. We might break even.

## ***Could this be an economically successful model?***

Don't know-probably. A way you could do it would be to get street trees without a traffic problem. The trees would need to be hearty. The seller would need a market, we use only one retailer, the bookstore. They would also need to have a good name, being associated with the uc davis name helps us succeeded.

***Site size?*** ~200 trees on Russell and ~200 elsewhere on campus. Planted 8 acres last year.

***Is there any community involvement?*** No community harvesting but student farm does that. No undergrad courses yet, only industry courses.

