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Foundations for  
Sustainable Local  
Economic Development  
Planning

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Urban  
Agriculture

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## **Introduction**

This research analyzes the effectiveness of urban agriculture as a tool for economic development. We focus on defining and describing the rationale for urban agriculture as it relates to sustainable and local economic development. We discuss the social, economic, and development implications from the current literature and examine case studies to determine strategies and methods for implementation.

Urban agriculture—is it an effective strategy for sustainable local economic development?

## Chapter 1 - Understanding Urban Agriculture

In the past few decades, much of the United States' rural land has been re-zoned to support ever-expanding cities and suburbs. This loss of rural land has changed our conception of the traditional location of agriculture; farming is no longer confined to the rural realm. As of 2000, urban locations provided up to 30% of agricultural production in the United States (Adeyemi, 2000).

The Community Food Security Coalition's North American Urban Agriculture Committee defines urban agriculture as “. . . the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities” (2003). Urban agriculture is found in many different forms, such as rooftop and wall gardens in dense urban spaces, green belts around cities, peri-urban farms, and community gardens. Peri-urban agriculture is located on the fringe of a town, city, or a metropolis (California Green Solutions, 2007). Urban farmers cultivate a variety of produce and products including fish, some farm animals, bees, as well as the standard fruits and vegetables.

### History of Urban Agriculture

Although urban agriculture is gaining momentum in the United States, it is not a new practice. The term “urban agriculture” was popularized in the 1960's, when it was used by the French in their observations of African villages (Mougeot, 2000). For years, urban residents around the world have practiced container gardening on rooftops. In fact, several European countries have developed policies to encourage green roofs (Burros, 2009). In the United States, the modern urban agriculture movement began with World War II Victory Gardens, which allowed urban citizens to grow food and help offset the high cost and demand for fresh produce (Schukoske, 2000). The local food movement has grown in the last two decades due to organizations such as Slow Food.

#### *Slow Food Movement*

In the past two decades, the concern with food equity, security, and disappearance of local food has led to the creation of the international and local Slow Food movement. In 1986, Carlo Petrini began the International Slow Food Movement in Bra, Italy (Severson, 2008). Slow Food International is a:

non-profit, eco-gastronomic member-supported organization that was founded in 1989 to counteract fast food and fast life, the disappearance of local food traditions and people's dwindling interest in the food they eat, where it comes from, how it tastes and how our food choices affect the rest of the world. (Slow Food International, 2009)

The movement now has 100,000 members in 132 countries, including a branch located in the United States.

Slow Food USA was established in 2000 and received the support of renowned American chef and owner of Chez Panisse, Alice Waters, who advocates for “good, clean, and fair” food economy (Chez Panisse, 2009). This belief led to the creation of The Edible Schoolyard at Berkley's Martin Luther King, Jr. Middle School. The Chez Panisse Foundation financed the

school's one-acre garden, kitchen classroom, and an "eco-gastronomic" curriculum. The successful Edible Schoolyard has prompted the School Lunch Initiative, a national program that integrates a nutritious school lunch and gardening experience into the public school curriculum. In addition, Chez Panisse supports local farmers committed to sustainable agriculture. This local produce is used in many of the restaurants dishes.

Often linked with Slow Food, the "Buy Local" and "Locavore" trends, the increase in popularity of farmer markets, and the adoption of new technologies all suggest that the demand for urban agriculture is growing. "Buy Local" is the belief a person, or "Locavore", should sustain him/herself with food produced within 100 miles, rather than consuming food that traveled thousands of miles over several days (Ferris et al, 2001).

### *Urban Farmers*

According to data obtained from the "Urban Agriculture and Community Food Security in the United States: Farming from the City Center to the Urban Fringe," urban counties have produced 79% of the fruit, 68% of the vegetables, and 52% of the dairy products in the United States (Brown and Carter, 2003). Typically, modern urban farmers are divided into three categories: commercial farmers, community gardeners, and backyard gardeners. In addition, urban farmers can include hospital patients and staff, schoolchildren, residents of assisted living facilities, and members of senior centers. Urban farms take on various forms, including commercial farms, community gardens, and backyard gardens. According to the United States Department of Agriculture (USDA), many commercial urban farms are 25 acres or less and generate less than \$250,000 in gross annual sales (2009). Commercial urban farmers sell directly to the local market through farm stands or the farmers' market. In addition to providing fresh produce and products to the inner city, urban commercial farms often provide employment for inner city youth.

Community gardens are small plots located on large lots of vacant land. Typically, a municipality, community group, land trust, or private owner owns the land lots. Unlike commercial farmers, community farmers keep the majority of the produce for private use or share with family and friends. Although, very few community gardeners benefit from additional revenue generated by their produce, many farmers see budget savings due to the availability of "home grown" produce. Backyard gardens include small plots around homes, container gardens on rooftops, balconies, or decks. An estimated one quarter of American households has a backyard garden (The Community Food Security Coalition's North American Urban Agriculture Committee, 2003). Like community farmers, backyard farmers grow produce to supplement their diet and to share with family and friends. From green roofs to vacant lot community gardens, urban agriculture is becoming a staple in many American cities.

### **Current Practice**

Trends such as the Slow Food Movement, "Buy Local" campaigns, and the growing popularity of community farmers markets have created a demand for locally grown produce in urban environments. Even large retailers such as Wal-Mart are beginning to embrace locally grown food. Many municipalities are beginning to realize the benefits of urban agriculture as a community and economic development tool that promotes sustainable practices. Both the cities of Philadelphia and Chicago promote urban farming as part of sustainability agendas. Montreal now allows farming in parks. Dessau, Germany, a city in economic decline, promotes

reclamation of land for public gardens and urban agriculture. Detroit's Eastern Market attracts processing, warehousing, restaurants, and other businesses (Flisram, 2009, p. 462). On a national level, the US Department of Agriculture plans to build a demonstration garden with fruits and vegetables and convert the entire grounds into a sustainable landscape. The First Lady recently planted a garden and built a beehive on the White House lawn to promote healthy eating (Hodgson, 2009).

As agriculture adapts to urban environments, new methods abound. New York makes use of its expansive rooftops for gardens. One such garden in Manhattan holds 200,000 pounds of soil on the roof of a production company building. This garden produces vegetables distributed to local restaurants and eateries. In Jamaica Queens, a 10,000 square foot greenhouse sits on a roof for hydroponic growing and on the Upper East Side, Eli Zabar's greenhouse has been capturing heat from his bakery since the 1990's. Two full-time employees staff his greenhouses, which provide produce for sale in Zabar's stores (Shulman, 2009). Walls can also provide space for growing food in urban areas. The Food Chain Edible Wall project has created vertical gardens on the sides of buildings in Los Angeles and Harlem (Pendola, 2009). As urban agriculture gains momentum, innovative methods will continue to develop.

### **Technology and Future Trends**

The continued evolution of urban agriculture may well promote further sustainable practices. Urban aquaculture and hydroponics can work in tandem; farmers raising fish in large tanks can recycle that water for hydroponics, as the nutrients are useful in growing produce. In turn, the heat from fish tanks can warm greenhouses in the winter. Biodigesters can reduce carbon emissions, process wastes, and provide heat and power for greenhouses. Composting can provide a tool for brownfield remediation. Urban areas can also make use of byproducts like sewer sludge for fertilizer. Vertical farming in glass buildings may even provide a practical reuse for old glass office buildings (Flisram, 2009). As urban agriculture gains popularity, new and innovative methods will continue to develop.

The growing popularity of local food has caught the attention of several large retail chains such as Wal-Mart and Whole Foods. In 2008, Wal-Mart made a commitment to buy local foods in order to reduce prices and provide higher quality produce. Whole Foods Market even offers low-interest loans to organic growers near their chains. The Whole Foods Market's Local Producer Loan Program offers a total of \$10 million in loans each year to promote local agriculture ("Buy Local" 2007, p. 2). In the future, these partnerships with local growers will likely become more popular with retailers both large and small. Several articles also mention that farmers' markets have increased in numbers, size, and profit over the past several years and they will no doubt continue to do so. The farmers' markets allow local farmers the benefit of direct marketing, offer fresh produce to community residents, and create a sense of community. The popularity of farmers' markets can gain momentum using new technology, such as MarketMaker, which allows people to locate local markets and producers in their area.

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## Chapter 2: Sustainable Concepts in Practice

Urban agriculture's contributions to sustainable local economic development are not simply about producing food and gainful employment, because the real benefits to communities come from the ideals and goals that are inherent in its definition and implementation. "It is not its urban location which distinguishes urban agriculture from rural agriculture, but the fact that it is embedded in and interacting with the urban ecosystem," (Richter et al., 1995). Urban agriculture brings food production, and hence the environment, closer to the community. At the least, it facilitates nutritional and environmental awareness among both youth and adults and creates critical social spaces in which individuals can interact with each other and further community cohesion.

As compared to rural agriculture, urban farming allows for greater water, pesticide, and fertilizer conservation as well as encouraging composting and recycling. By making urban agriculture a priority in local development, this directly affects social issues, community cohesion, health and nutrition, food security, environmental issues, and even local economic issues. Author Patricia Allen notes that there are very few, if any, federal-level policies that significantly shape food security in local communities. One example given is the Community Food Security Empowerment Act, which supports traditional food programs but does not address long-term or sustainability issues (Allen, 1999). On the other hand, a "USDA urban garden program initiated in 1976 has helped low-income people in cities to grow and preserve vegetables" (Allen, 1999, p 123).

Author Jane Schukoske reports urban agriculture's contributions to sustainable development in metropolitan areas. One of the most notable improvements is the use of green space to replace vacant lots. Whether the land is vacant due to population shifts or a deteriorating local economy, the vacancy attracts trash, crime, contributes to low community morale, and lowers surrounding property values (Schukoske, 2000). In certain metropolitan areas like New York, local governments adapted policies to facilitate redevelopment of these vacant plots. They even compile an inventory list of vacant lots, public lands, and agencies that assist in the conversion of these lots into community gardens or plots. In 1987, the City allowed gardeners to sell their produce. Other case studies of metropolitan areas using this same method also saw a reduction in crime and illegal dumping (Schukoske, 2000). *New York Times* author, Tracie McMillan, discusses the success of urban gardens in Detroit, Milwaukee, and Oakland. In Detroit, the Garden Resource Program Collaborative records almost 450 gardens spread throughout the urban prairie (McMillan, 2008). As it has great potential to benefit the economic, social, and environmental composition of urban spaces, methods of urban agriculture are becoming more abundant and more accessible in urban areas.

### Economic Impact

According to Greg Flisram, urban agriculture has a "growing influence as a community and economic development tool" (2009, p. 15). Urban agriculture provides a local food market, fresh produce, and additional income for residents of all income levels (Flisram, 2009). In some cases, urban agriculture may arise out of necessity. "Food deserts" describe neighborhoods that lack access to healthy and affordable food. In cities, these are generally low-income neighborhoods comprised by racial or ethnic minorities. In some cases, residents may even live and work in areas involved in food production, but lack access to local foods because of the



decentralized nature of the industrial food production and distribution system (Shigley, 2009). “Urban neighborhoods without a reliable supply of healthy food desperately need the nutritional and economic subsistence that urban farming can provide” (Flisram, 2009, p. 16)

### *Land Values*

In addition to providing necessary nutrition, urban agriculture has the potential to improve blighted areas and provide jobs. The current housing and real estate market troubles have created a large supply of vacant land. Urban farmers can convert these areas to farms or gardens with low start up costs. In addition, the work requires lower skill levels, making this an appropriate economic development method for low-income neighborhoods that tend to have lower levels of education and professional training (Flisram, 2009).

Some municipalities are taking advantage of vacant land to plant community gardens. Philadelphia charges \$1 a year for community gardens in empty, blighted lots (Freeman, 2009). The Detroit city council now uses land banking to make use of city owned properties; residents can adopt land for community gardens for a \$20 annual permit fee. The state of Michigan also has a program allowing residents to lease state lands for \$50 to grow gardens (Bonfiglio, 2009). When residents make use of vacant and/or blighted land, gardens and green space also improve housing values (Flisram, 2009). Vancouver even promotes gardens as a community amenity (Mendes, Balmer, Kaethler, & Rhoads, 2008).

The spillover effect on surrounding properties creates another strong argument for the importance of incorporating urban agriculture. The landscaping could be as simple as keeping the grass cut, or paving a walking path and bushes to have a positive effect on the area around it. This transformation is most noticeable when a property is initially under maintained, resulting in lower residential property values. A Philadelphia study of property values found that neglected vacant sites cause a reduction in values for surrounding property of about 18%, while cleaned and landscaped vacant lots can increase values of surrounding properties as much as 30% (*Re-Imagining a More Sustainable Cleveland*, 2009). The benefits of redeveloping vacant properties have proven themselves to have promising effects; community gardens offer an opportunity to transform unsightly vacant lots and significantly increase property values.

### *Linking Production and Consumption*

The San Francisco group Roots of Change promotes the “good food movement” to link grower, retailer, restaurant, and consumer in a 100 mile radius, or sustainable “foodshed” (Shigley, 2009). Urban agriculture is not just about growing, but also economic capture. Cities have the ability to develop an economy around food production, linking production and consumption for local sustainability. This allows cities to keep investments and profits in the local market by pooling resources, developing support services and buyer-seller co-ops (Flisram, 2009). Another movement, “community food security,” links production and consumption in an approach that considers the entire system from planning, producing, marketing, retail, and community and economic development (Allen, 1999). Food produced outside communities lowers the tax base and reduces the number of local jobs available (Bonfiglio, 2009).

Urban farms have some benefits not found in rural areas. Metro farmers, unlike rural farmers, are less likely to identify farming as their occupation, meaning they are not completely dependent on farm yields for their livelihood. In addition, urban farmers are more likely to farm intensively, diversify, and adapt to changing conditions and demand. They may also benefit

from urban land values. Evidence shows that metropolitan farmers are less likely to be “financially vulnerable” than their rural counterparts (Heimlich, 1989, p. 462).

In addition, urban farmers are more likely to engage in direct selling, as they have access to a large consumer base in close proximity (Heimlich, 1989). Direct selling provides economic benefits, allowing farmers to capture more of the income from their products and allowing consumers to pay lower prices for fresher produce. In addition, producers and consumers gain the social benefits of direct interaction. From an environmental perspective, direct selling reduces the amount of greenhouse gas emissions involved in shipping products to retail markets. To take advantage of local markets, policies should allow small farm stores and small grocery stores that support local markets (Shigley, 2009). The cities of Seattle and Cleveland allow citizens to grow and sell produce (Freeman, 2009). Health concerns and environmental awareness have led some consumers to spurn mass produced and processed foods, making smaller stores desirable and “providing niches for smaller-scale, more environmentally sensitive, organic agriculture operations” (Heimlich, 1989, p. 463). An example of the local buyer-seller link is the Cress Spring Bakery in Madison, Wisconsin. Owner Jeff Ford built his bakery on communal farmland with a homemade oven at its center. He uses scraps from a local mill to fuel the oven and buys rye, spelt, soft wheat, and other ingredients locally. He also uses natural fermentation and grinds wheat on mixing day to make the most of the nutritional value. This allows him to sell to customers with food allergies, as well as the environmentally and nutritionally conscious. He regularly sells out of his loaves at the farmers market (Muhlke, 2009).

#### *Benefits of Local Food Markets*

Several studies measure the local economic impact of small local stores and farmers’ markets. In “Farmstands vs. Big Brands,” the author found that, “Every \$100 spent at a local firm leaves \$68 in the Chicago economy, compared with just \$43 when \$100 is spent at a chain store” (Frazier, 2004). In addition, an Iowa study found farmers’ markets accounted for \$20 million in direct sales and created a total economic impact of \$31.5 million in 2004. Spin offs from the market created an estimated 471 full-time jobs (Hughes, Brown, Miller, & McConnell, 2008). Iowa has the most farmers’ markets per capita in the country, with an estimated 1,600 vendors, 135,000 customers, and 140 full-time employees (Krouse & Galluzzo, 2007). Other cities and states might also benefit from increased investment in farmers’ markets.

Linking urban growers to urban markets has great potential for economic capture in local communities. A report by the Illinois Local and Organic Food and Farm Task Force calculates that Illinois residents spend an estimated \$48 billion on food each year and that nearly all of this money leaves the state. The report advocates the development of a local food system. Project implementation will allow 20 percent of Illinois food expenditures to be grown, processed and distributed in-state by the year 2020 (“Local Food, Farms & Jobs: Growing the Illinois Economy,” 2009).

#### *Conserving Resources*

Conservation of resources and adaptive reuse also provide economic benefits. Lawns are currently the most irrigated crop in the US; “watering all the lawns in the lower 48 states requires 200 gallons of water per person per day” (Worrel, 2009, p. 23). Lawns could be replaced with edible gardens, using the former irrigation to produce useful and potentially marketable goods (Worrel, 2009). Older industrial areas can also take advantage of space and infrastructure for

aquaculture and hydroponics (Flisram, 2009). Tarpon Springs, Florida has changed waterfront zones once designated only as industrial land use (allowing only boatyards and manufacturing) to allow commercial food processing. In the past, locally caught seafood had to be transported out of the city for processing. Today, seafood can be processed on site, and the city is beginning a campaign to promote Tarpon Springs Seafood (Haller, 2009).

Urban agriculture does have economic challenges. Land may have costly environmental issues and irrigation may be expensive. Theft and vandalism may occur more often in urban areas. In addition, upfront investments may be too costly for some communities, and politicians who want to see a higher use of land may be unwilling to help. Furthermore, linkages between farmers and consumers may be difficult if the produce does not fit the taste and culture of the local market (Flisram, 2009). In Vancouver, developers receive tax savings when they convert vacant land from commercial to recreational/nonprofit, but the city loses tax revenue (Groc, 2009b). On the other hand, one might argue that if this improves the value of surrounding real estate, the city will profit in the long run.

Many proponents of urban agriculture favor small markets – not export industries. If cities embrace urban agriculture as a sustainable economic development practice, it may no longer remain a small cottage industry (Flisram, 2009). As markets grow and expand some proponents of urban agriculture may find this growth troubling. However, urban agriculture has proven to be a sustainable and adaptable practice, and there is no doubt that urban agriculture will continue to develop suit a variety of different markets.

## **Social Equity and Health**

Some of the largest health issues faced by Americans are exacerbated by poor dietary habits. The California Center for Public Health Advocacy found that, “people with a higher Retail Food Environment Index Score—that is, people with greater access to fast food and convenience stores than to grocery stores—were more likely to be obese and diabetic” (Shigley, 2009, p 26-31). In many cases, this is because fresh produce is not readily available in low-income urban areas. These “food deserts” most often effect minority populations in metropolitan areas. Fruits, vegetables, and other produce are substituted for foods that are high in calories and low in nutritional value. By making produce available and augmenting diets with additional urban agriculture applications, such as fresh fish, it is likely that cities will help improve public health, especially in lower-income areas (Shigley, 2009).

In Baltimore, food access issue is the focus of several academic investigations. The John Hopkins University's Bloomberg School of Public Health released a study that revealed residents living in predominately black and low-income areas paid 20 percent more for basic food items. Basic food items such as milk, fresh produce, and whole grains are difficult to attain in food desert areas, and the high cost of these items often prohibits purchase (Hodgson, 2009). Due to potential health benefits from increased access to fresh produce, residents and policymakers are beginning to consider urban agriculture as a viable option. Allen's article, entitled “Reweaving the food security safety net: mediating entitlement and entrepreneurship,” supports this notion, stating that implementation of community-based production and distribution projects create “new economic spaces”, such as farmers markets, food-based microenterprises, organic produce, and community-focused agriculture (1999, p 123.)

Urban agriculture also promises to improve community cohesion. Community Gardens can engage residents and create pride in community. They offer urban residents the opportunity to connect with nature and provide educational opportunities for youth. Furthermore,

movements such as Community Supported Agriculture (CSA) create connections between farmers and communities.

## **Environmental Benefits**

Another notable benefit of urban agriculture is that it helps alleviate environmental problems. Among the environmental issues addressed by urban agriculture are microclimate improvement, waste recycling, water management, biodiversity, global atmospheric pollution, and environmental awareness (Deelstra and Girardet, 2000).

Microclimate improvements refer to the natural ability of green spaces such as gardens to improve their surrounding environments. They have the potential to make a targeted area beautiful, comfortable, and fragrant. Urban gardens increase humidity, absorb more heat and create shade, capture dust and gases from polluted air, and often produce more favorable smells than typical urban surroundings (Deelstra and Girardet, 2000). The benefits of green rooftops include increased absorption of solar radiation (the main contributor to heat island effects) and increased shade for the building, which lowers cooling costs. Waste and nutrient recycling is a common problem in urban areas due to the increased detrimental effects of improper waste disposal. One method of dealing with urban waste is composting, which can be used in urban gardens as fertilizer. Unlike commercial fertilizers and pesticides used in traditional agriculture, organic compost does not become contaminated runoff. Urban agriculture, if conducted properly, does not use excessive chemical treatments that harm the environment (Deelstra and Girardet, 2000).

Water management is an increasingly important issue due to water limitations in many areas. Increasing green spaces will increase the amount of storm water that is absorbed by the land rather than dumped into sewage or risk flooding areas. At the least, this can minimize the cost of improving sewage infrastructure as well as help replenish aquifers. Although rural agriculture has larger amounts of water run-off from production, there is a concern that urban agriculture has concentrated levels of chemicals and fertilizers that can affect an urban city's water supply (Deelstra and Girardet, 2000).

Although rarely discussed, biodiversity is another environmental benefit that can be fostered by urban agriculture. The creation of more green space allows diverse flora and fauna to thrive. Beehives in urban areas actually produce more honey than those located in rural areas because cities often have more trees and flowers than intensely farmed rural areas with minimal crop diversity.

The issues of global warming and atmospheric pollution are daunting subjects; however, urban agriculture may help alleviate these problems. Plants absorb carbon dioxide (CO<sub>2</sub>), a pollutant far more common in urban than rural areas (Deelstra and Girardet, 2000). In addition, by bringing production and processing industries closer together, less carbon dioxide is emitted due to less transportation needs (Deelstra and Girardet, 2000). The increase of green space inside of urban cities benefits the environment on a local, regional, and global level.

Measuring the benefits of urban agriculture is not an easy task. In *Awareness and Action in the UK*, Howe and White outline the benefits of urban agriculture to surrounding urban areas. Urban agriculture is useful in linking social, educational, environment, and health issues, even if it cannot outright solve them. The potential benefits of urban agriculture are not always obvious, and the literature in this school of thought often puts an emphasis on changing society's

perception of issues such as food security, community cohesion, and the environment (Howe and White, 2001). This is why urban agriculture's contribution to sustainable development is not typically measured in gross domestic product, but rather is presented as an overarching goal for society.

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## Chapter 3 – Alternate Perspectives

While a large number of metro areas in the United States are developing urban agricultural practices, many international and peri-urban agricultural examples offer a long history of practice as well as new, alternate perspectives on urban agriculture.

### International Urban Agriculture

Although urban agriculture is just now gaining a foothold in the United States, our review of the literature has found examples of urban agriculture in cities throughout the world. Some cities have benefited from urban agriculture for many years, while others are just now realizing the benefits of locally grown produce. Many methods used internationally are similar to those in the United States. However, specific methods depend on context. While some international methods of urban agriculture focus on food shortages, others focus on income generation. These international examples offer a wide variety of models for sustainable practices.

Not far from the United States, Canada has made substantial strides in promoting and implementing urban agriculture. In Vancouver, honeybees at the Fairmont Waterfront Hotel rooftop garden pollinate plants and make honey. This 2,100 square foot rooftop garden produces \$12,000 a year in produce (Groc, 2009b). In addition, Ward Teulon's company, City Farm Boy, takes care of gardens that residents do not have time to tend themselves. The residents receive some money, and the leftover produce goes to local farmers' markets (Groc, 2009b). This progressive city focuses on social and economic aspects of sustainability. The City formed a food action plan for creating a "just and sustainable food system for the City of Vancouver" (Mendes et al., 2008, p. 443). Urban food production lies at the heart of the strategy. In planning for urban food, the city conducted a land inventory to identify potential sites for agricultural uses. This study identified 77 sites, later expanded inventory identified 639 sites (Mendes et al., 2008). This linkage with planning is necessary for the local promotion and expansion of urban agriculture.

In Canada and the United States, urban agriculture is a result of the "Buy Local Food" movement. This movement, as previously stated, addresses issues such as food security. While urban agriculture may seem to be a novel movement in the United States, many cities in third world countries depend upon urban agriculture as a primary source of fresh food.

#### *Addressing Food Shortages*

In other countries, hunger issues provide the momentum for urban agriculture. More than 800 million people are malnourished and 24,000 people die each day from hunger-related causes (Phemister, 2009). The world's urban population has outgrown the rural, and one third of urban residents live in slums. As a result, feeding cities has become a worldwide concern. The United Nations estimates that two thirds of the world's population will be urban by 2030 (Appropriate Technology, 2007). On a global scale, production currently matches the population; however, distribution is unequal. The steps in food production, processing, and distribution have become isolated, making the food system vulnerable (Phemister, 2009).

International food shortage issues fall into three categories: food emergencies in natural disasters, chronic food insecurity (including lack of access and affordability), and episodic insecurity (occurring when staple crops run out) (Phemister, 2009). Innovative international methods attempt to address these issues. In South Africa, the PlayPump hooked up to a merry-

go-round draws water into towers. Venezuela has 4,000 gardens of one meter or less and 21 hectares of compost-driven produce cooperatives. Some methods have not always been models of sustainability, but have learned from past errors. The United Nations now purchases locally grown food in Zambia to distribute to needy residents and refugees, because the previous method of distributing US grains put Zambian farmers out of work (Phemister, 2009).

### *Income Generation*

While some countries focus mainly on farming to meet human survival needs, others see the benefits of extra income. Urban agriculture can provide much-needed earnings for low-income families. Even those who do not sell the produce they cultivate have income freed up that would have been spent on food (Bryld, 2003). In the Democratic Republic of Congo, the Food and Agriculture Association (FAO) is helping cities develop allotment gardens to produce vegetables. The 16,000 participating families receive fresh produce and extra income. The gardens also provide green space that is lacking in cities (Appropriate Technology, 2007).

Argentina has seen community gardens transform from a survival tool to a method for growing jobs. In Rosario, 7,000 formerly unemployed residents assumed jobs clearing land, harvesting produce, and selling in street market stalls in a government funded agriculture program. In a city where 61% of residents were living in poverty in 2001, this program offers economic relief and potential for continued growth (Valente, 2006). Urban agriculture also offers the opportunity for women to become involved in business where they otherwise may not have opportunities to contribute to the family incomes. In many communities, women are in charge of cultivation. Eric Bryld asserts that this provides “an important livelihood strategy for the household and especially female members” (2003, p. 81).

### *Food Security*

Urban agriculture also offers a solution to the problem of food insecurity. Low-income urban residents have fluctuating salaries, are often dependent on cash to purchase food, and may suffer from malnutrition. By growing their own food, they have a more reliable source of subsistence (Bryld, 2003). Furthermore, availability of fuel, transport, and fertilizer can threaten an area’s ability to feed local residents. This was the situation in Cuba during its economic crisis in the 1990’s. The collapse of the Soviet Union left Cuba with a 75% drop in imports. Because the country was dependent on the Soviet Union for chemical inputs for agriculture, Cubans had to make radical adjustments in their farming methods (Altieri et al., 1999).

Having faced a blockade, Cuba was somewhat prepared for a disruption of petroleum imports. Beginning in 1987, Raul Castro, Cuba’s minister of defense, encouraged a new technology for urban agriculture. Organoponicos are 30 meters by 1 meter raised beds of soil and organic material that were originally installed in military facilities. In the 1990s, this method of farming was adapted to civilian use as urban gardeners began to grow their own food in a time of economic crisis. Urban agriculture continues today and provides many Cubans with jobs (Koont, 2009). Cuba’s methods are innovative, low cost, and environmentally friendly because they do not use chemical products. Cuba’s National Urban Agriculture Program employs an estimated 300,000 people (Grogg, 2008).

Citing Cuba as a model, architect Andre Viljoen’s work in Britain attempts to integrate urban agriculture into buildings (Brady, 2007). Internationally, other innovative methods for urban agriculture abound. In the cities of Bogota and Medellin in Colombia, the United Nation’s Food and Agriculture Organization has taught families living in barrios to grow food in small



gardens in their homes. These gardens use containers such as old tires, recycled water bottles, and trays. Using hydroponics, these urban farmers grow plants on windowsills, courtyards, and stairs to gain access to light (Appropriate Technology, 2007).

### *Sustainable Practices*

In many communities around the world, the availability of water can place substantial limitations on urban agriculture. Dakar, Jordan, and Cyprus use wastewater to irrigate crops. This reduces both water costs and the costs of fertilizer, because wastewater contains vital nutrients. After the adoption of wastewater use for irrigation, water bills in Jordan were 27% lower while in Cyprus they were 36% lower. Dakar's farmers saw an increase of 50% in lettuce yields with wastewater irrigation (Redwood, 2003). In many cases, environmentally sustainable practices produce significant economic benefits.

People continue to leave the countryside in search for jobs and better opportunities found in cities. With over half the world now living in urban areas, the importance of urban agriculture will no doubt continue to grow. In the United States, many rural and urban residents are settling on the urban fringe. Like their metropolitan counterparts, these urban fringe residents are benefitting from small scale, local farms. Urban agriculture provides many benefits to cities and residents.

### **Non-metro (Peri-urban) Agriculture**

Non-metro or peri-urban areas offer examples of sustainable practices such as Community Supported Agriculture (CSA), Organic Farming, and Farmers Markets. These methods can link to urban agricultural production and consumption within local markets.

### *Community Supported Agriculture (CSA)*

Using the previous definition of urban agriculture, non-metro, or peri-urban, agriculture can be defined as production and distribution of food and agricultural products located in the urban fringe. Like urban farms, peri-urban farms are generally small and farmers sell the produce to urban residents. Community Supported Agriculture (CSA) is an example of peri-urban agriculture. According to "Community Supported Agriculture (CSA) in the Midwest United States: A Regional Characterization", CSA in the United States began in 1984; however, Community Supported Agriculture was practiced in Europe and Japan in the 1960s (Tegtmeier and Duffy, 2005). By definition, "Community Supported Agriculture (CSA) is a growing social movement that endeavors to make direct connections between the producers of food and those who consume it" (Cone and Myhre, 2000, p. 187). A farmer who participates in CSA offers a number of "shares" to the public. Shares are produce grown by the farmer and delivered to members, who purchase a subscription. Throughout the farming season, members receive shares on a weekly basis. The goals of CSA are to provide quality food and protect small farms by creating communities of farmers and consumer members (Local Harvest, 2009).

The "Community Supported Agriculture (CSA) in the Midwest United States: A Regional Characterization" describes CSA farms located in Iowa, Illinois, Kansas, Michigan, Minnesota, Missouri, North Dakota, Nebraska, and Wisconsin. Typically, the farmer covers the cost of food production by membership shares (subscriptions). In addition, the subscriptions pay the farmers and farm employees' wages. In return, members receive ". . .a seasonal supply of fresh, reasonably-priced produce. . ., a direct relationship with the farmer. . ., an opportunity to

learn about agriculture and local ecosystems; and a community-building connection with farmers, neighbors and landscapes” (Tegtmeier and Duffy, 2005, p. 5).

The Midwest study on CSAs reports that the average age of CSA farmers is younger than farmers nationally, and that 53% of CSA farmers are women. In addition, Cone and Myhre’s CSA study of 209 households found that women initiated 74% of the CSA memberships. Seventy-eight percent of the respondents to their survey were completed by women, and women were 88% of the household members who processed CSA produce (2000).

Many CSA farmers practice organic farming. According to Local Harvest, organic farming produces food that has not been exposed to harmful chemicals. In addition, organic farmers must take into account the health of the soil and the ecosystems supporting the produce and livestock (Local Harvest, 2009). The United States Department of Agriculture (USDA) defines organic agriculture as “an ecological production management system that promotes and enhances biodiversity, biological cycles and soil biological activity. It is based on minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony” (Gold, 2007).

### *Organic Farming*

According to Georgia Organics, more than 4 million acres in the United States support organic agriculture (2009). Currently, the State of Georgia only has 1,700 acres in organic production. Organic farmers may sell their produce locally through CSA memberships, on-farm markets, restaurant sales, and farmers’ markets. On-farm markets allow consumers to travel to farms to purchase fresh produce. These markets can include pick your own and farm stands. Benefits to on-farm markets include:

- Farmers can work between serving customers
- No direct competition with other farmers
- Time savings as there is no travel or packing to travel
- Market can be set up at farmer’s convenience
- Customers generally come to the farm
- Customers build relationship with farm and farmer
- Creates opportunities for other activities such as tours or workshops (Georgia Organics, 2009).

Farmers who sell directly to local restaurants experience several benefits. These benefits include higher and more stable price, increased marketing for the farm, market for specialty produce, and ability to collaborate with chefs to develop new products. Perhaps the most frequent market for locally grown organic produce is the farmers’ market.

### *Farmers’ Market*

A recent national survey of Farmers Market Managers found that there were 4,093 farmers’ markets in 2005 and nearly 30% of the markets were less than five years old (Ragland and Tropp, 2006, p. 1). In 2005, total sales from farmers’ markets were estimated to have exceeded \$1 billion. The growth and popularity of farmers’ markets throughout the United States has led to the demand of organic produce. Seventy-one percent of farmers’ markets that sold organic products were located in urban areas (Ragland and Tropp, 2006). Markets in the Far West and Northeast sold more organic products than other regional farmers’ markets. The majority of organic produce sold included fresh fruit and vegetables; the second largest sector of organic products include herbs and flowers. Farmers’ markets provide a convenient venue for

farmers, provides local jobs, and supports the local community through the cyclical circulation of money (Hughes, Brown, Miller, and McConnell, 2008).

Peri-urban agriculture will continue to grow as more people move to the urban fringe, and large scale farming decreases due to urban sprawl and the costliness of traditional farming. Peri-urban farming, like traditional urban farming, provides for the local community and is a way to ensure food security in the United States and abroad. Both urban and peri-urban agriculture will undergo changes due to the emergence of new technologies and the demands of consumers.

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## Chapter 4 - Case Studies

The following case studies represent examples of utilizing urban agriculture as a sustainable economic development tool. Both Cleveland and Vancouver offer examples of metropolitan practices. However, they exist in two drastically different contexts. Cleveland has a declining population and large tracts of vacant land, while Vancouver is a dense, environmentally conscious city noted for its quality of life. These two examples highlight urban agricultural practice in two radically divergent contexts. The Ann Arbor Farmers Market, Indian Line Farm, and Walker Organic Farms offer examples of sustainable peri-urban practices that benefit urban residents as well as those on the urban fringe, offering an alternate model for urban agricultural practices.

### Case Study: Cleveland, Ohio

#### *Context*

Cleveland's population was approximately 914,808 in 1950. Over the next 50 years, it saw its population drop to almost half that number. The projected population of Cleveland in 2016 is 387,039, according to The Northern Ohio Data and Information Service (2008). The decline in population has created about 3,300 acres of vacant land and an estimated 15,000 vacant buildings. While the city demolishes about 1,000 vacant houses per year, it has a unique opportunity to make lasting decisions about where development should or should not occur. Residents and law makers recognized an opportunity to stabilize the changing landscape in a way that will establish Cleveland as a "green city on a blue lake" (*Re-Imagining a More Sustainable Cleveland*, 2009).

With the goal of making Cleveland a cleaner, healthier, more beautiful, and economically sound city, a 30 person workgroup investigated different strategies for reusing vacant land. The report itself was funded by the Surdna Foundation. The *Re-imagining a More Sustainable Cleveland* group included city staff, representatives from community development corporations, local non-profit organizations, the Cuyahoga County Planning Commission, the Northeast Ohio Regional Sewer District, and the Cleveland Metroparks. The report details its goals and strategies for making the vacant properties productive, and addresses the policy changes that will enable it to be applied to the whole city. These strategies will: advance a larger, comprehensive sustainability strategy for the city, benefit low-income and underemployed residents, enhance the quality of neighborhood life, create prosperity in the city, and help address climate change (*Re-Imagining a More Sustainable Cleveland*, 2009). This case study will follow the progress and influence of the Surdna report from the policy makers and politicians to the implementing organizations.

#### *Organizations/Operational Practices*

Cleveland Mayor Frank Jackson approved \$450,000 in grants for 58 projects inspired by the Surdna foundation's "ReImagine a Sustainable Cleveland" study. The \$450,000 comes from a \$25 million federal Neighborhood Stabilization Program grant to the city and will be matched by \$30,000 from Neighborhood Progress Incorporated's Strategic Investment Initiative and \$56,500 from the Surdna Foundation. Lefkowitz states that:

Some \$227,000 falls under the ‘greening’ category, while \$327,000 will support urban agriculture and \$79,000 will go toward experiments in ‘phytoremediation’ or using plants to pull toxins like lead from soil. The NSP grant will also pay \$50,000 to Parkworks and OSU Extension to manage the training, technical assistance and helping projects get started. (2009).

These Greening projects, which are scheduled to begin in Spring of 2010, include the buying up of abandoned properties by residents as well as demonstration projects such as the application of engineered beds, known as “bioswales,” that are intended to help the city deal with flooding issues. These projects are intended as pilots to be replicated throughout the estimated 3,300 acres of vacant land in Cleveland (Lefkowitz, 2009).

The City of Cleveland also created a Gardening for Greenbacks program that offers grants to established or trained urban farmers who want to start or expand their business ("Urban Farmers Growing Profit in Cleveland," 2008). The Gardening for Greenbacks program seeks to establish Cleveland as a model for local food system development. The objectives of the program are to advance the food system development agenda at the city level and to ensure that every resident has access to fresh, healthy, and affordable food. This program will serve as a resource to the community by assisting in solution oriented local food system development. To qualify for the program, applicants must be a member of a farmer’s cooperative, Fresh Stop, or other community supported agriculture program that sells food and shares proceeds. Eligible applicants can receive up to \$3,000 for specified gardening-related items such as tools, display tables and booths, irrigation systems, rain barrels, and greenhouses ("Gardening for Greenbacks Brochure," 2009).

Eco Village is a neighborhood collaborative that has created over 180 community plots on vacant lots planted with various herbs and vegetables that are sold to local restaurants or at farmers markets. This organization has been operating since 2005, and has gained much support from the community and the local government. Eco Village notes the savings to the city from not having to tend a vacant lot, profits made from selling the produce, and an increased sense of shared community. To combat the potentially polluted or infertile land on the vacant plots, Eco Village composts its own soil and uses a raised bed technique to grow its produce ("Urban Farmers Growing Profit in Cleveland," 2008). Organizations throughout Cleveland have been working together as well as independently to implement the city’s strategy for successfully incorporating urban agriculture into their city.

### *Outcomes*

While many gardens remain undisturbed, a very important challenge to note in this process is the simple fact that if the gardeners do not own the land, they can be evicted at any time. In 2006, Cleveland developers removed a thriving community garden on West 117<sup>th</sup> to build a Target. This was also the case for more than five other gardens in the last five years, until Ward 13 Councilman Joe Cimperman introduced legislation to give these gardens a layer of legal protection. The ordinance allows for a parcel of land to be designated as a community garden. More importantly, it makes the creation of community gardens a public process, which is an important step in giving the community a say in how its neighborhood is zoned. Cimperman explains that “by zoning these gardens we are preserving them for generations. We’ve already seen a great response because people are realizing that they can plant without having their gardens taken away from them” (Brady, 2007).

### *Lessons Learned*

Cleveland, Ohio has made an exceptional effort to incorporate urban agriculture into their model for a more sustainable city. The policy suggestions implicit in this case study and outlined in the Surdna report include supporting community organizations, setting tangible city goals, re-zoning, and providing infrastructure. An example of a tangible city goal would be that all residents will be within a minimum of ½ mile or ¼ mile radius of a community garden or market garden. To make this possible, it is necessary to create proper infrastructure such as access to affordable water sources and waste disposal or composting resources. Additionally, this case study has shown the importance of enforcing complementary policies such as creating or revising the zoning of urban garden districts to facilitate the redevelopment process. Cleveland's urban gardening district zoning code includes a detailed outline of building, easements, and other regulations that can be adapted by planners or policy makers to their own development strategies (see Appendix).

Local communities throughout the United States are partnering with nonprofit organizations and government officials to redevelop underused or vacant lots into community and neighborhood gardens. The success of this strategy is shown not just by its growing popularity, but by the short and long-term improvements made to the community. Cleveland's success can be modeled by other cities aspiring to become more green, or just to diversify their local economy and improve the lives of their inhabitants. In Atlanta, there are several public community gardens sponsored by non-profit organizations like ParkPride, which works to improve the quality of parks throughout Atlanta, as well as helping neighborhoods start their own community gardens.

### **Case Study: Vancouver, Canada**

#### *Context*

Vancouver has a long legacy of environmental awareness, but a new impetus toward sustainability and increasing concerns over urban food security have led the city to fully embrace urban agriculture as an environmentally, economically, and socially sustainable practice. Today, 44% of the residents of Vancouver are involved in some form of urban agriculture, and the city is working to grow that percentage even more (Davis, 2009). A look at Vancouver's history reveals how government and citizens have embraced urban agriculture and built it into the life of the city.

Urban agriculture in Vancouver grew out of a movement to preserve agricultural land and an acknowledgement that continued outward sprawl would ultimately be unsustainable. Because citizens placed a high value on the surrounding natural landscape, the city began focusing on protecting the natural environment in the 1950's. In spite of this concern, by the late 1960's and early 70's the region was losing 6,000 hectares of farmland each year. To reverse this trend, the Land Commission Act of 1973 established the Agricultural Land Reserve (ALR) and a commission to oversee it. This designation influenced patterns of urban growth toward infill development and higher density development in the city (Smith & Haid, 2004).

Agriculture plays a large role in Vancouver's economy. Metro Vancouver's agricultural land features rich alluvial soils and a climate which enable it to produce 27% of British Columbia's farm income on less than 1.5% of the province's farmland ("Metro Vancouver Agriculture," 2009). As a result, preserving agricultural lands is important not only for environmental reasons, but also for the region's economic vitality.

Concern for the preservation of metro Vancouver's farmland as an economic and environmental resource, declining health, and concern over the growing distances between food producers and consumers led the city to examine its own local food system (Bradley & Mendes, 2005). In 1973, when the ALR came into effect, about 86% of the vegetables needed to feed Metro Vancouver residents were grown locally. In 2008, only 43% were grown locally (Sinowski, 2008). Vancouver now has a population of over 550,000 in a region of over 2 million people (Underwood, 2009). With this growing population and shrinking farmland, urban agriculture became a more and more important strategy for creating a sustainable city.

### *Strategy and Stakeholders*

The economic, environmental, and social implications of agriculture all came into play in the development of Vancouver's agricultural strategy. Vancouver's Food Action plan integrates food planning into a sustainable urban development agenda and promotes collaboration and the coordination of multiple partners (Veenhuizen, 2006).

The Food Action Plan grew out of 10 years of community organizing efforts of multiple partners throughout the city. The City Council approved the development of a "just and sustainable food system" for the city on July 8, 2003. The Food Policy planning process engaged organizations who play a part in producing, processing, distributing, accessing, and consuming food. This addressed more than just the issue of urban agriculture, but also farmers markets, emergency food distribution, food retail access, local food economies, and waste management; benefits were social, environmental, and economic (Bradley & Mendes, 2005). Vancouver's strategy continues to evolve, with the publication of its 2009 plan *Vancouver 2020*. The plan calls for Vancouver to become the world's greenest city by 2020, and urban agriculture is one component of the action plan. Noting that food creates about 25% of the carbon emissions of the average urban resident, the 2020 target calls for a 33% per capita reduction of the carbon footprint of food, with the long-term goal of becoming the global leader in urban food systems. The plan also notes the importance of local food as a means of supporting farmers, processors, and retailers, and capturing profit in the local economy (Vancouver 2020: A Bright Green Future, 2009).

### *Organization*

Citywide food policy planning was a challenge. Some of the resources and policy tools fell outside of the City Council's jurisdiction. The development of partnerships was a key ingredient in developing a successful Food Action Plan. Community organizations such as Vancouver Agreement, the Vancouver School Board, the Vancouver Park Board and Vancouver Coastal Health played a strong role in the planning process as well (Veenhuizen, 2006). The combined commitment of political leaders and key stakeholders brought the issue to the forefront of the city's concerns through a collaborative process.

Vancouver's success in implementing urban agriculture practices is due in large part to the efforts of the Food Policy Council. The Council has acted as a lead organization throughout the planning process by researching practices and developing policies to enable urban agriculture. The Council comprises 20 seats that include members of the agricultural community including growers, nutritionists, food wholesalers and distributors, food retailers and grocers, non-profit organizations, and academics. The group's main goal is to study the operation of the local food system and provide ideas and policy recommendations to create a sustainable food system (Bradley & Mendes, 2005).



At the regional level, the Agricultural Advisory Committee, created in 1992, represents agriculture commodity groups and raises awareness about the importance of agriculture. The Agriculture Committee, a regional board committee created in 2006, provides advice on policies and programs for the region ("Metro Vancouver Agriculture," 2009).

### *Supporting Organizations*

One of the most important supporting organizations for urban agriculture in Vancouver is City Farmer, Canada's office of urban agriculture. The office was established in 1978 by a group of environmentalists working at the Vancouver Energy Conservation Center. The revelation that an enormous amount of fossil fuel goes into transporting food from distant farms led to the realization that people could save money and energy by growing food at home ("City Farmer," 2009).

City Farmer began publishing a newspaper to promote urban agriculture which quickly grew in popularity. In 1981, they created a Demonstration Food Garden to get hands-on experience for their growing advice; they also used this opportunity to implement several major urban agriculture experiments. By 1994, City Farmer was able to go online, attracting attention from all over the world. The organization became a partner in the Netherland's based Resource Center on Urban Agriculture and Forestry (RUAF) in 1999. City Farmers has become a resource for integrating urban agriculture into policies and programs of national and local governments in Africa, the Middle East, South America and Asia. City Farmer continues to serve as a model for the rest of the world by demonstrating diverse methods of urban agriculture in Vancouver. The site features resources for urban gardeners on a wide variety of topics as well as news, information, and pictures of community gardens ("City Farmer," 2009).

Two other nonprofits have an interest in urban agriculture, though their support of agricultural production is not solely urban-oriented. Farm Folk/City Folk is a nonprofit organization that "promotes a sustainable food system" through educational outreach and community partnerships ("Farm Folk/City Folk," 2009). In addition, the website Eat Local provides lists of Vancouver farmers markets to support local farmers ("Vancouver Farmers Markets," 2009).

One for-profit organization that plays a large role in Vancouver's urban agriculture is City Farm Boy. City Farm Boy is a company owned by Ward Teulon, a professional agrologist who promotes urban agriculture and community supported agriculture in Vancouver by providing advice to gardeners, garden share services, and a local supply to farmers markets ("City Farm Boy," 2009).

### *Special organizational tools*

Organizational tools involved in Vancouver's Food Policy Initiative include the Food Action Plan as well as a Food Charter, which includes strategies aimed at increasing access to groceries and waste management (Bradley & Mendes, 2005). The Food Policy Initiative began first with a small group that set the course for bringing more organizations to the table. The group created a mandate for the process including plans, goals for action, and a background/briefing document entitled *Closer to Home: A Recipe for a Community-Based Food Organization* ("City of Vancouver Food Policy Web pages," 2009).

The Food Policy Initiative involved multiple community organizations and received support and funding from Health Canada, the Vancouver Agreement Food Task Team, and the organization Growing Green. Government and community input, workshops and speakers, and a

growing public awareness of health issues and sustainability led to the passage of the Food Action Plan ("City of Vancouver Food Policy Web pages," 2009).

### *Operational Practice*

The Vancouver City Council approved support of a "just and sustainable food system" that involved the integration of food production, processing, distribution, consumption and recycling. The system is "just and sustainable" because it improves environmental, economic, social and nutritional health (Veenhuizen, 2006, p. 67).

Both the city and community were involved in planning for food system issues. However, once the eight month public consultation process ended and the Food Action Plan gained approval, Vancouver showed commitment by hiring two food policy staff to aid in the implementation of food-related initiatives including community gardens, urban beekeeping, fruit trees, and edible landscaping (Veenhuizen, 2006). The two City staff positions facilitate food system planning by serving as city food policy experts; one position acts as a permanent, full-time Food Policy Coordinator, while the other is a temporary two year Food System Planner ("City of Vancouver Food Policy Web pages," 2009).

Vancouver's initiative includes partnerships to promote healthy low-carbon diets, nonprofit partnerships to provide food to low-income communities, and marketing to encourage the conversion of lawns to gardens and small plot intensive farming. The most recent plan also suggests supportive policies for green roofs, development requirements for community garden set asides, and an edible landscaping policy for city facilities (*Vancouver 2020: A Bright Green Future*, 2009).

The Food Action Plan focused on areas where the city had jurisdictional power to support their goals. To implement the areas of the plan that were not within the city's power, the Plan looked for opportunities for collaboration. The Action Plan included three components, including a recommendation to create a Vancouver Food Policy Council, a five action item work plan, and an implementation Support System. The Food Policy Council identified a number of priority work areas, including the creation of a Food Charter for the City of Vancouver, increased access to groceries for residents, an Institutional Food Purchasing Policy, and the development of a coordinated effort towards food recovery ("City of Vancouver Food Policy Web pages," 2009). The Food Policy Council's five action items included a city-wide food system assessment, rooftop gardens, community gardens, farmers markets, and coordinated food processing and distribution facility for low income citizens ("City of Vancouver Food Policy Web pages," 2009).

Vancouver's planning process also focused on equity issues. In researching the Local Food System, a food assessment of the City of Vancouver focused on the Downtown Eastside. The food assessment sought to identify populations most vulnerable to food insecurity to improve access, nutrition, and provide community development opportunities (Bradley & Mendes, 2005). In addition, the Grow a Row, Share a Row program encourages local gardeners to grow an extra row of vegetables for the Greater Vancouver Food Bank Society and Neighbourhood Houses in Vancouver.

The City Council continues to update guidelines and recommendations that encourage sustainable urban agricultural practices. In 2007, the Mayor and Council unanimously adopted the Vancouver Food Charter that promotes education, celebration and projects for a healthy economy, a healthy ecology, and a healthy society. Promotion of community gardens is ongoing; the Food Policy team encourages community gardens throughout the city, updating webpage information and creating a community garden at City Hall. Furthermore, the city adopted the

2,010 by 2010 initiative, a challenge to establish 2,010 gardens in the city by the Olympic Games in 2010 ("City of Vancouver Food Policy Web pages," 2009).

In March 2009, staff began drafting guidelines and recommendations that would allow residents to keep backyard hens. The City also promotes urban beekeeping to increase biodiversity and pollination for plants in backyard, community and public gardens. Keeping of honeybees within city limits is permissible if beekeepers register with the BC Ministry of Agriculture and Lands ("City of Vancouver Food Policy Web pages," 2009).

Recent initiatives show a greater focus on the entire food system, including processing, storage, and distribution. According to planning recommendations, funding for urban agriculture will support resources such as non profits that provide resources for farmers, processors and distributors, land and facilities for local food processing, storage, and distribution, greenhouses and urban aquaculture pilot projects, and capacity building urban agriculture projects in low-income neighborhoods (*Vancouver 2020: A Bright Green Future*, 2009).

Vancouver's efforts also emphasize environmental conservation. The City Farmer Vancouver Compost and Water Conservation Demonstration Garden provides citizens with the opportunity to learn about the benefits of urban agriculture and green technologies. In addition, the City will provide rain barrels and backyard composters to Vancouver residents at subsidized rates (\$25 and \$70, respectively) to encourage water conservation and backyard composting (Underwood, 2009).

### *Outcomes*

Vancouver has found urban agriculture to be a useful tool for economic development. For the most part, Vancouver is a prosperous city. However, poverty still exists. The Downtown Eastside is a center for drug activity and the sex trade industry. The area is filled with litter and exhibits a lack of community investment (Underwood, 2009).

As part of Vancouver's green economy program, the half acre SOLEfood farm beside the Astoria hotel in Downtown Eastside was built by volunteers to serve as a source of food and employment for inner city residents. The food is grown according to the needs of inner city agencies and numerous community kitchens. The sponsoring organization, United We Can, collaborated with Building Opportunities with Business to create a horticultural training program for 12 inner-city residents. United We Can then employed the residents to work in the garden and educate the community. Results of the green economy program will be presented in a report to the Vancouver City Council in January 2010 (Shaler, 2009).

One important component of Vancouver's food policy is the promotion of urban agriculture through information and education. City Farmer's garden and workshops attracted over 6,500 people last year, and the City Farmer staff responded to almost 4,000 phone call enquiries. Over 2,000 rain barrels and over 36,000 composters have been sold. Each backyard composter diverts about 250 kg of organic waste from landfills annually; this adds up to a total organic waste reduction of 9,000 tons for the entire city each year (Underwood, 2009).

Community gardens provide social benefits, though they are more difficult to quantify than economic or environmental benefits. They provide the opportunity for outdoor recreation and social interaction. Educational sites have been established in schools to facilitate education about the biology of food and habitats and demonstration gardens have provided the opportunity for gardens to bring education to citizens of all ages. Some social gathering opportunities utilized in Vancouver include harvest parties, seed swaps, and community events. Urban

agriculture provides urban residents to find links with nature that they otherwise would not be able to find in the city (Bradley & Mendes, 2005).

### *Innovative Practices*

Vancouver, with its long legacy of urban gardening, experiments with new and innovative practices. Vertical farms have become a growing trend in Vancouver. Most of these vertical gardens are installed in walls on the sides of buildings. They have been installed at the aquarium, the Four Seasons, Whole Foods, and at the Canada Line station at the airport. Most utilize a Japanese system of interconnecting containers, creating a grid of plants that hangs like a tapestry on a wall. Plants are placed in coconut fiber (not soil) cells in 12 inch boxes. A drip irrigation system provides water to the plants. They can typically live for 5-10 years before they need to be replaced. If necessary, individual panels can also be replaced without having to dismantle the whole structure. Besides providing an aesthetic enhancement, green walls also provide the benefit of cooling buildings in the summer and providing insulation in the winter (Whysall, 2008).

Some developers have also explored options for vertical farms with glass walls, solar panels, and irrigation systems. These could potentially rise up to 30 stories and grow vegetables, fruit, chickens and fish under one roof throughout the year. These vertical greenhouses can function inside parts of buildings or actually occupy an entire building. However, there is little evidence that these projects can be cost effective. Opponents argue that vertical farms are too expensive and should not come at the expense of preserving agricultural lands (Sinoski, 2008).

The University of British Columbia's Greenskins Lab has proposed a plan to create farms on boulevards. In the right of way on public land along boulevards, the Greenskins Lab proposes biointensive farming, on-site energy generation, and rainwater harvesting. The proposal promises an urban farm and social space that is inviting to the public. Greenskins Lab also claims to serve the public good by creating green jobs to support the local economy. Similar projects have been implemented in France and China (Davis, 2009).

Farmers markets, community gardens, and events that connect producers and consumers are key components of the City's agricultural initiatives. The planting of an organic garden at City Hall, allocating additional land for community gardens, creating community orchards, additional support for farmers' markets, and a landscaping policy of planting trees, bushes, and other plants that produce fruit, nuts, herbs, and other edible products were all part of "The Greenest City: Quick Start Recommendations" that came out of the Vancouver 2020 planning process (*Vancouver 2020: A Bright Green Future*, 2009).

### *Lessons Learned*

Vancouver organized, set tangible goals, and created supportive policies to promote urban agriculture, facilitating the implementation of planning goals. For example, when the City Council passed the motion in 2006 to promote the creation of 2,010 new garden plots by the Vancouver 2010 Winter Games, the city had 950 plots in 18 gardens. By July of 2009, the city had more than 1,700 new plots in more than 40 community gardens (Davis, 2009). Continued dedication to looking for new ways to implement urban agriculture has also been helpful in implementing new and innovative methods.

Online tools, particularly those available through the City Farmer website, have also aided in the implementation of community gardening throughout the city. Partnerships with key organizations have contributed resources and expertise that Vancouver's government would not

have been able to contribute on its own. In addition, the city led by example, creating gardens in city spaces.

Most of Vancouver's initiatives have historically focused primarily on the production side of urban agriculture. While the city has added more farmers markets to create a connection between production and consumption, the distribution and consumption side of urban agricultural production has only recently become a major factor in Vancouver's implementation. Vancouver's 2020 planning initiative has shifted to a more sustainable focus, with a perspective on the broader impacts of the urban food system.

Vancouver's plan to become the world's greenest city highlights the fact that growing produce in urban gardens is only a small part of the sustainable urban food system; a large portion of the economic value, emissions, and social dimensions of the food system come after the growing process. Distribution, and consumption are facets of urban food planning that deserve more attention (*Vancouver 2020: A Bright Green Future*, 2009).

As Vancouver continues to study and revise its food policies, it will no doubt create even more innovative methods of improving food systems planning. Certainly, its innovative techniques and implementation of community gardens offer a model for sustainable economic development practices that could be replicated on a smaller scale in the City of Atlanta.

## **Case Studies: Peri-Urban Agriculture**

By definition, peri-urban agriculture is the production and distribution of food and agricultural products located in the urban fringe. Typically, peri-urban farms are small and farmers sell their produce to urban residents. The following case studies highlight examples of farmers' market, community supported agriculture (CSA), and an organic farm.

### **Ann Arbor Farmers' Market**

#### *Context*

In the United States, farmers' markets are located in small towns and large cities. These markets support local farmers and provide fresh produce to urban residents. A recent national survey of Farmers Market Managers found that there were 4,093 farmers' markets in 2005 and nearly 30% of the markets were less than five years old (Ragland and Tropp, 2006, p. 1). In 2005, total sales from farmers' markets were estimated to have exceeded \$1 billion. One of the oldest farmers' markets in the United States is located in Ann Arbor, Michigan. This market has been operated by the City since 1919 and has undergone several administrative changes.

#### *Organization*

Throughout the years, the farmers' market has been under the administration of several city departments; currently, a full-time staff member housed within the City's Parks and Recreation Department manages the market. In 1998, the city passed an ordinance that delineates the rules and regulations used to govern the market (Shenot and Saloman, 2006). Vendors interested in renting a stall space must submit an application and prove the products sold are grown locally or produced by the vendor. In addition, city officials may inspect the vendors' stalls to ensure compliance with the market's rules.

In 1998, the City created the Farmers' Market Commission, which includes nine residents and vendor representatives. The purpose of this commission is to guide daily market operations.

According to city rules, the representatives must include one annual vendor, one daily vendor, one artisan vendor, one regular consumer, and five local residents. Commission representatives serve a term of one to three years and must attend monthly meetings.

### *Operational Practice*

The City has worked to develop a Farmers' Market master plan using input from local residents (Shenot and Saloman, 2006). This plan will guide the market's future growth and provide recommendations on improving existing market facilities and ways to diversify the utilization of market space. To guide this planning process, city officials created a steering committee composed of local businesspeople, Downtown Development Authority representatives, city staff, and Farmers' Market Commission members. The steering committee and consultants created blueprints that will guide the future of the market.

Currently, a full-time market manager manages the farmers' market, who creates an advertising and promotional campaign. Additional duties include forging community relationships, increasing vendor and customer attendances, attracting new vendors, and maintaining a relationship with existing vendors. In addition, the Ann Arbor Farmers' Market is self-supported by revenue generated through collected stall rents (Shenot and Saloman, 2006). In addition, on non-market days, the City rents the site for use as a parking lot, which generates additional income for the market.

### *Outcomes*

According to Shenot and Saloman, Jayne Miller, the City's community services area administrator, states ". . .the farmers' market is 'consistent with what the community values,' which includes protecting the region's farmland" (2006, p. 6). To protect local farmland and to ensure the continued production and sale of fresh produce, Ann Arbor residents approved a 30-year property tax increase. Money generated from this measure will enable the city to purchase conservation easements on active farmland. This tax increase will allow for the protection and preservation of 7,000 acres of open space and farmland within and surrounding Ann Arbor. In addition, the City Council created a nine member Greenbelt Advisory Commission, who will advise the council on farmland acquisition. As of 2006, the City has purchased the development rights of three properties near Ann Arbor. One purchase included the land of a local soybean farmer, who was a regular vendor at the farmers' market. This purchase and future purchase will enable residents to include fresh, locally grown produce into their daily diets, support local farmers, and keep local money in circulation throughout the City.

## **Indian Line Farm**

### *Organization*

Early CSA farms in the United States were directly influenced by European biodynamic agriculture. This unique farming approach is defined as "a method of organic farming that treats farms as unified and individual organisms, with an emphasis toward balancing the holistic development and interrelationship of the soil, plants, and animals as a closed, self-nourishing system" ([www.growbetterveggies.com](http://www.growbetterveggies.com), 2009). One of the first Community Supported Agriculture farms in the United States is the Indian Line Farm. Located in Egremont, Massachusetts, this property has a long agrarian history. For much of the 20<sup>th</sup> century, Indian Line Farm served as a dairy farm. In 1985, through the efforts of Robyn Van En, Jan Vander

Tuin, and a group of citizens, Indian Line Farm became established as a CSA farm. In 1999, Elizabeth Keen and Alexander Thorp purchased the farm through a partnership with the Community Land Trust in the Southern Berkshires and the Nature Conservancy. Subsequent to the initial purchase, the Nature Conservancy purchased a conservation restriction on the majority of the farm for an additional \$50,000. In addition, the Community Land Trust sold the farm buildings to the farmers and agreed to a 99-year lease on the property. Currently, the farm operates on 17 acres and produces over 60 varieties of vegetables, fruits, herbs, and flowers. In addition, the farm has several laying hens that produce eggs and a couple of steers.

### *Operational Practice*

Indian Line Farm sells produce to members and the public at the Great Barrington Farmers' Market. Members are able to purchase a variety of shares (Indian Line Farm, 2009):

- A regular share provides enough food for two adults and cost \$600. Members are able to pick their own snow and snap peas, cherry tomatoes, string beans, and a weekly bouquet of flowers.
- A summer share is available for three months in the summer for residents in the Berkshires and cost \$475. Members are allowed to pick the produce available to regular share members.
- Working share members must commit to 32 hours of work and pay \$375. Tasks include weeding, harvesting, and transplanting. Members are allowed to pick the produce available to regular share members.
- Members who would like to a larger bouquet of flowers may purchase a supersize flower share for an additional \$50 with vegetables or \$100 without vegetables.
- For \$180, members may purchase a fruit share that provides fresh fruit from local farms. Fruit is available for 20 weeks (June-November).

In addition, the farm occasionally sells produce to local restaurants and stores. By selling to the local market, Indian Line Farms assists in the monetary circulation and economic stimulation of Egremont, Massachusetts.

Each year, Indian Line Farm provides two apprenticeships. Apprentices participate in greenhouse management, seeding, transplanting, cultivation, irrigation, harvesting, and cover cropping. In addition, apprentices learn how to manage the CSA and experience retail selling at the farmers' market. Apprentices must work nine-hour days (6:00 AM to 5:00 PM). First year apprentices receive \$500/month and \$100 food stipend, as well as a health insurance policy.

### *Outcomes*

The Indian Line Farm, like many CSAs throughout the United States, allows share members to purchase locally grown, pesticide-free food. CSAs have assisted in the local food movement in the United States. Retailers, such as Whole Foods, have further pushed the locally grown food demand. In addition, CSAs allows money to remain in local circulation. Due to the variable growing season, subscribers are limited to the variety of produce available (Roosevelt and Grande, 2003). CSAs have the “. . .potential to establish thousands of cells of environmental vitality in cities, suburbs and countryside, and to extend basic, healthy linkages among the people who make up a community” (McFadden, 2004).

## **Walker Organic Farms**

### *Context*

More than four million acres in the United States support organic agriculture (Georgia Organics, 2009). In Georgia, 1,700 acres of farmland are certified as organic. To sell produce labeled 100 percent organic, farmers must receive certification to participate in the United States Department of Agriculture's National Organic Program (USDA, 2009). According to the USDA (2009), the following information is necessary to receive certification:

- Type of operation;
- History of materials applied to the farm for the last three years;
- The products being grown, raised, or processed on the farm; and
- The Organic System Plan (OSP).

Once this information is received, certifying agents review the applications. In addition, an inspector visits the site to observe the practices, handling, processing methods used on the farm. If all paperwork is filed correctly and the inspector approves the site, the farm is granted a certificate. Each certified farm must undergo an annual review to ensure organic standards are met.

### *Organization*

One certified organic farm is the family owned and operated, Walker Organic Farms, located in Screven County, Georgia. This organic farm is operated by Relinda Walker, a third generation farmer in Screven County. In 2005, the Walker Organic Farms was officially certified as organic. Currently, the farm has 40 acres certified as organic under the USDA National Organic Program. Walker Organic Farms produces Vidalia onions, melons, peanuts, various vegetables, rye and soybeans, and cover crops.

The process from traditional farming to organic farming began when Walker sought to sell specialty produce to local restaurants, stores, and local customers. Walker Organic Farms became an experimental farm for organic Vidalia onions, weed management, no-till vegetable production, improved use of cover crops, and commercial organic peanuts. The organic produce grown on the farm is distributed in several places, such as:

- Vegetables and peanuts are sent to local markets and distributors;
- Rye seed (cover-crop) and soybeans (livestock feed and seed) are sold to organic producers; and
- Occasionally seasonal produce is sold in local stores, farmers' market, or local farm stands.

Walker Organic Farms produce may be found in several local stores, such as Brighter Day Natural Foods Market in Savannah, and Earth Fare Market and Café in Martinez, Athens, or Charleston, South Carolina. Destiny Produce purchases Walker Organic Farms produce that is sold at the State Farmers' Market in Atlanta. Local restaurants that use this farm's organic produce include the Blue Moon Café in Statesboro and Cha Bella in Savannah.

### *Outcomes*

Due to farm's commitment to produce healthy, organic produce, many regional and state residents have benefited. Walker Organic Farms produce is sold within the region, state, and South Carolina. Not only has the farm's commitment to organic produce benefited the local and state economy; it has also expanded the consumer's choice of organic produce. This farm's



experimental use of organic practices has led to the first organic peanut crop in Georgia and produced the first crop of organic Vidalia onions.

### *Lessons Learned*

Peri-urban agriculture covers a broad spectrum of food production. This case study examined the importance of farmers' markets, community supported agriculture, and organic farms in the context of the local food movement. The Ann Arbor Farmers' Market provides an example of how a local government can plan and implement a self-sustaining market that supports local agriculture and keeps money in the local economy. Indian Line Farm provides a model for implementing an economically viable CSA model and Walker Organic Farms offers a model for tapping into a growing market for organic produce.

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## **Chapter 5 - Conclusion**

Our review of the literature on urban agriculture has focused on economic and environmental viability, as well as the social impacts of urban and peri-urban agriculture. We have highlighted examples from the metropolitan United States, international cities, and the United States urban fringe. As the world continues to shift into metropolitan economies, we expect urban and peri-urban agriculture to become the prominent source of fresh fruits, vegetables, fish, dairy products, and other farm products. This makes urban agriculture a valuable strategy for sustainable local economic development.

### **Recommendations for the City of Atlanta**

Through a research of literature and in-depth case studies, we have found urban agriculture to be economically viable and sustainable. Urban agriculture promotes the “three Es” associated with sustainability—equity, economics, and environment. These are principles the City of Atlanta must keep in mind in planning for its local food system.

To encourage urban agriculture, the City of Atlanta should consider creating a department that will work to promote local food production and the City’s existing farmers’ markets. In addition, the City should develop a Food Policy Plan to guide future urban agricultural expansion. The plan should identify “food deserts,” or areas that lack access to fresh produce, and develop models for implementing gardens and markets in these neighborhoods. The plan should also include cohesive guidelines, as well as specific designations for future gardens and markets.

Another way to promote urban agriculture is to set tangible goals. Atlanta, like Vancouver, should determine a specific number of community gardens and urban farms by a certain year, i.e., 100 urban farms/community gardens located in the City by 2020. Atlanta should also utilize Cleveland’s model and develop zoning that allows urban agriculture. Finally, the City should consider promoting restaurants and stores that use and sell local produce. To do this, the City may sponsor an annual local food restaurant day that will highlight these businesses and their food suppliers. Encouraging the production and sale of local produce supports urban farmers and increases the health of the City’s residents. These recommendations, if followed, will allow the residents of Atlanta to access locally grown produce, as well as enable money to remain in local circulation.

Appendix: Zoning code for city of Cleveland, Ohio

**Chapter 336 — Urban Garden District**  
**("Urban Garden District," 2009)**

**336.01 Urban Garden District**

The "Urban Garden District" is hereby established as part of the Zoning Code to ensure that urban garden areas are appropriately located and protected to meet needs for local food production, community health, community education, garden-related job training, environmental enhancement, preservation of green space, and community enjoyment on sites for which urban gardens represent the highest and best use for the community.

(Ord. No. 208-07. Passed 3-5-07, eff. 3-9-07)

**336.02 Definitions**

(a) "*Community garden*" means an area of land managed and maintained by a group of individuals to grow and harvest food crops and/or non-food, ornamental crops, such as flowers, for personal or group use, consumption or donation. Community gardens may be divided into separate plots for cultivation by one or more individuals or may be farmed collectively by members of the group and may include common areas maintained and used by group members.

(b) "*Market garden*" means an area of land managed and maintained by an individual or group of individuals to grow and harvest food crops and/or non-food, ornamental crops, such as flowers, to be sold for profit.

(c) "*Greenhouse*" means a building made of glass, plastic, or fiberglass in which plants are cultivated.

(d) "*Hoophouse*" means a structure made of PVC piping or other material covered with translucent plastic, constructed in a "half-round" or "hoop" shape.

(e) "*Coldframe*" means an unheated outdoor structure consisting of a wooden or concrete frame and a top of glass or clear plastic, used for protecting seedlings and plants from the cold.

(Ord. No. 208-07. Passed 3-5-07, eff. 3-9-07)

**336.03 Permitted Main Uses**

Only the following main uses shall be permitted in an Urban Garden District:

(a) community gardens which may have occasional sales of items grown at the site;

(b) market gardens, including the sale of crops produced on the site.

(Ord. No. 208-07. Passed 3-5-07, eff. 3-9-07)

**336.04 Permitted Accessory Uses**

Only the following accessory uses and structures shall be permitted in an Urban Garden District:

- (a) greenhouses, hoophouses, cold-frames, and similar structures used to extend the growing season;
  - (b) open space associated with and intended for use as garden areas;
  - (c) signs limited to identification, information and directional signs, including sponsorship information where the sponsorship information is clearly secondary to other permitted information on any particular sign, in conformance with the regulations of Section 336.05;
  - (d) benches, bike racks, raised/accessible planting beds, compost bins, picnic tables, seasonal farm stands, fences, garden art, rain barrel systems, chicken coops, beehives, and children's play areas;
  - (e) buildings, limited to tool sheds, shade pavilions, barns, rest-room facilities with composting toilets, and planting preparation houses, in conformance with the regulations of Section 336.05;
  - (f) off-street parking and walkways, in conformance with the regulations of Section 336.05.
- (Ord. No. 208-07. Passed 3-5-07, eff. 3-9-07)

**336.05 Supplemental Regulations**

Uses and structures in an Urban Garden District shall be developed and maintained in accordance with the following regulations.

- (a) *Location.* Buildings shall be set back from property lines of a Residential District a minimum distance of five (5) feet.
- (b) *Height.* No building or other structure shall be greater than twenty-five (25) feet in height.
- (c) *Building Coverage.* The combined area of all buildings, excluding greenhouses and hoophouses, shall not exceed fifteen percent (15%) of the garden site lot area.
- (d) *Parking and Walkways.* Off-street parking shall be permitted only for those garden sites exceeding 15,000 square feet in lot area. Such parking shall be limited in size to ten percent (10%) of the garden site lot area and shall be either unpaved or surfaced with gravel or similar loose material or shall be paved with pervious paving material. Walkways shall be unpaved except as necessary to meet the needs of individuals with disabilities.
- (e) *Signs.* Signs shall not exceed four (4) square feet in area per side and shall not exceed six (6) feet in height.
- (f) *Seasonal Farm Stands.* Seasonal farm stands shall be removed from the premises or stored inside a building on the premises during that time of the year when the garden is not open for public use.
- (g) *Fences.* Fences shall not exceed six (6) feet in height, shall be at least fifty percent (50%) open if they are taller than four (4) feet, and shall be constructed of wood, chain link, or ornamental metal. For any garden that is 15,000 square feet in area or greater and is in a location that is subject to design review and approval by the City Planning Commission or Landmarks

Commission, no fence shall be installed without review by the City Planning Director, on behalf of the Commission, who may confer with a neighborhood design review committee. If one exists, so that best efforts are taken to ensure that the fence is compatible in appearance and placement with the character of nearby properties.

(Ord. No. 208-07. Passed 3-5-07, eff. 3-9-07)