

## **INNOVATIVE SMALL-SCALE AGRICULTURE (ISSA): UTILIZING INTRA-URBAN, PERI-URBAN, AND SUB-URBAN LANDSCAPES TO TRANSITION TOWARDS A MORE SUSTAINABLE FOOD SYSTEM**

KAT SUPERFISKY, 2009  
UNIVERSITY OF MICHIGAN

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### **Introduction to the Issue: The Current Food System, the Need for an Alternative**

The future of food is at the forefront of current political, social, economic, and environmental debate, given the increasingly problematic state of the food system. For the purpose of this paper, the “food system” refers to the production, processing, distribution, consumption, and waste management by which humans so commonly obtain their food (Pothukuchi & Kaufman, 2000). The current system employs a “scorched-earth mentality on resource management” and a general disregard for the social and environmental costs associated with such a paradigm (Rosset, 2000).

As agriculture continues to be industrialized, small-scale farming endeavors are increasingly lost to a system of monopolization and corporate control (Badgley, 23 November 2009). This negatively affects the viability of local communities by marginalizing small-scale farmers, reducing employment opportunities, and lowering the tax base (Badgley, 23 November 2009). Since 1979, more than 300,000 farmers have been driven out of business, and currently, 68 percent of the nation’s food is produced by only 8 percent of the farmers in the United States (USDA, 1998; USDA, 2003).

The current food system thrives on clearing vast expanses of land in order to pave the way for endless monocultures dependent on heavy chemical inputs, hefty government subsidies, and high yielding varieties that are shipped across county, state, and international borders (Badgley, 23 November 2009). This system causes the homogenization and fragmentation of landscapes into a matrix that impedes species migration, causing significant biodiversity loss (Vandermeer, 1 December 2009).

Not only is the process of growing food in an industrialized system problematic, but the distribution is as well. The industrialized system has alienated food consumers from producers; the average food bite now traveling 1,500 miles before reaching an American's plate (Hill, 2008). As only 1 to 2 percent of American's food is grown locally, fossil fuel consumption for transportation has skyrocketed, contributing to the issues of global warming, import dependency, and national security (Badgley, 23 November 2009; Robbins, 2005). According to a Greenhouse Gas Emissions report produced in 1999 by the Environmental Protection Agency (EPA), the food system accounts for approximately 16 percent of total U.S. energy consumption. Aside from the environmental effects, transporting food is also a source of economic drain, sucking up 6 to 12 percent of every dollar spent on food in the U.S. (Rhodes, 1993). This is money that could be better spent paying farmers a fair price for their products, allowing subsidies to be allocated to small-scale organic farms, rather than large corporate farms.

The increased concentration of food production, processing, and distribution as part of the current food system has inevitably led to a host of negative social and environmental outcomes. These harmful effects have progressively come to the attention of consumers, and will continue to be exacerbated during this time of extreme economic hardship. As the state of the economy continues to disintegrate, society is not only experiencing an 'economic crisis,' but moreover, an 'eco-crisis'. Both economic *and* ecological, this crisis is characterized by food, water, fuel, and capital scarcity, all of which are perpetuating the harmful effects of the food system. The eco-crisis is forcing people to confront these mounting pressures, and decide how to move forward. The solutions employed to manage the narrowing of resources will determine the level of success, survival, and sustainability that society and its' structural systems will achieve, and should thoughtfully consider humans' relationship with the earth. (Knowd et al., 2005)

As stated by the Food and Agriculture Organization (FAO), "Land is not just a resource to be exploited, but a crucial vehicle for the achievement of improved socioeconomic, biological and physical environments" (Rossett, 2000). It is important to avoid exploitation, and rather, work with the land to move forward towards the achievement of a more balanced state. The current food system has evolved into a system that no longer solves more problems than it causes, illuminating the dire need for a transition towards a more sustainable alternative (Vandermeer, 1 December 2009).

With concerns about the sustainability of the current food system continuing to mount on a national, as well as global scale, now is the time to rise and create a revolution (Knowd et al., 2005). A directed shift away from the industrialized practices of resource exploitation and social disregard towards a more sustainable, integrative system is imperative.

**The Solution: A Multifaceted Transition towards more Sustainable Agriculture**

Given the complex problems associated with the current food system, there exists an equally complex network of roads down which the necessary transformation could travel. One thing is certain, however, that there exists no one cure-all for the collection of issues that industrialized agriculture has evoked. Instead, the transition should be approached in a multifaceted manor, diversifying solutions so as to cater to the diverse array of problems and circumstances that exist in the current system. This multifaceted transition towards an alternative will hold the greatest promise for establishing a “rich and sustainable relationship between agriculture, landscape and society” (Knowd et al., 2005).

The conversion of pre-existing agricultural endeavors towards smaller, more sustainable practices has been the main focus of the transition thus far. Ideally, these newly divided small-scale farms will transform into closed-loop systems with organic growing methods, and connect with surrounding communities to sell products at a more localized scale. Although this alternative would effectively lessen environmental degradation, reduce the costs associated with transportation, and simultaneously strengthen the local economy, this approach should not be viewed as the single solution.

Given that all humans need food to survive, the issue of the food system is an issue for every human being. Therefore, it should be dealt with by society as a whole. Rather than continuing to rely on the small number of rural farmers in the United States to fix the system and grow the nation’s food in a sustainable manner, more effort should focus on taking this issue to all people, directly connecting consumers with their food.

The alternative, more sustainable food system should incorporate agriculture into every location that humans inhabit. This idea promotes the expansion of agricultural production into un- or underutilized landscapes and spaces in intra-urban, peri-urban, and sub-urban zones. The structure of cities and suburbs has changed over time, but the promise of utilizing these zones of development to achieve a more sustainable solution to the food system remains. The purpose of this paper is to introduce the idea of Innovative Small-Scale Agriculture (ISSA) and propose its utilization in the transition towards a more sustainable food system.

**Innovative Small-Scale Agriculture (ISSA): Horticulture on a Human Scale**

Given the currently unstable state of both the agricultural and economic systems in the U.S., there exists a heightened opportunity and need for change. In order to properly redefine and strengthen the food system, it is imperative to incorporate many different appropriately-scaled forms of agriculture into regions. This necessitates expanding the scope of food production into innovative areas that do not traditionally support agricultural activities.

The figure below illustrates the range of opportunities for agriculture across a rural to urban transect. Each zone contains different forms of agriculture that can be appropriately employed within that particular area.

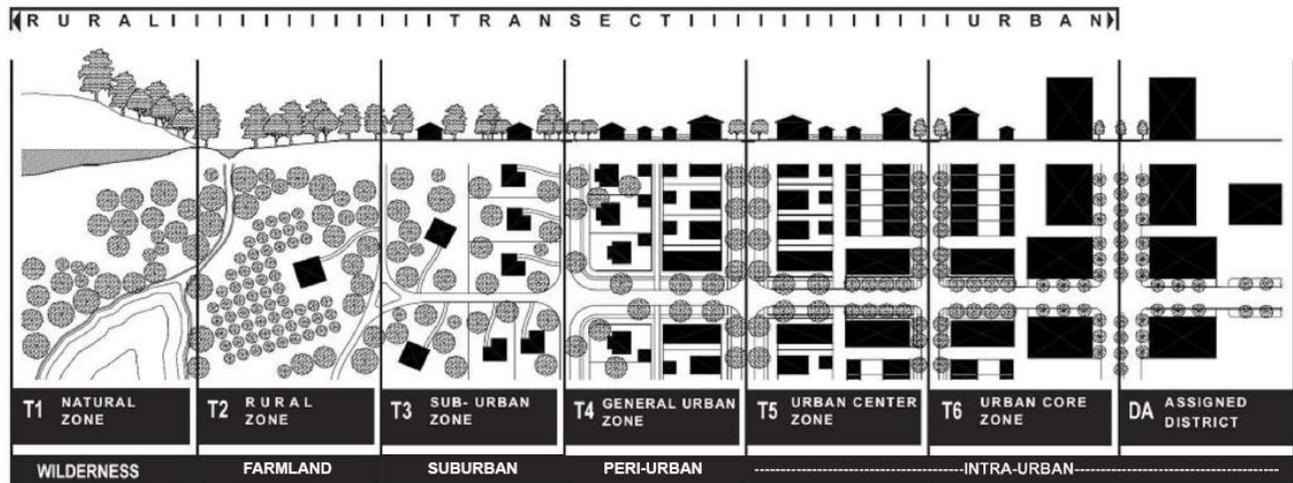


Figure 1. Continuum of Agricultural Production Opportunities. This figure illustrates the range of opportunities for and appropriate types of agriculture across a rural to urban transect. (Modified from: Morton, B. (2006). *Planning for Appropriately Scaled Agriculture in Providence*. Retrieved December 18, 2009, from <http://www.farmfreshri.org/learn/docs/urbanag-planning.pdf>)

Traditionally, most agricultural endeavors have taken place in zone T2, the rural zone. Innovative Small-Scale Agriculture, however, can be employed in the sub-urban zone (T3), general urban zone (T4), urban center zone (T5), urban core zone (T6), and the assigned district zone (DA), providing a wide range of opportunities for agricultural expansion. This extension of food production out of the traditional rural zone and into sub-urban, peri-urban, and intra-urban zones is the principle idea behind Innovative Small-Scale Agriculture (ISSA).

### Defining ISSA

Innovative Small-Scale Agriculture (ISSA) is a broad concept that incorporates a multitude of agricultural activities, in a diverse array of locations, for a variety of purposes. Production through ISSA can range from fruits and vegetables, to aquaculture and animal husbandry. Aside from food growth and harvesting, ISSA can also entail the processing, marketing, and distribution of agricultural products for either personal consumption or sale. ISSA undertakings are located within urban areas (intra-urban), on the fringe of urban areas (peri-urban) (Mougeot, 2000), or directly outside of urban areas (sub-urban). Locations utilized can be extensive—be it a vacant city lot, public park, front lawn, balcony, right-of-way, window sill, or rooftop—and come in all shapes and sizes in order to maximize opportunity, accessibility, and efficiency. (Kaufman & Bailkey, 2000)

Utilizing even a small fraction of the vacant lots, sub-urban estates, architectural structures, etc. across the U.S. has the capability of significantly contributing to the nation's food security. Lawns alone account for 18 million acres of land within the U.S. (Brown, 2009), demonstrating that small spaces add up to having significant potential for agricultural endeavors.

Localizing the production, processing, marketing, distribution, and consumption of agricultural products through ISSA reduces the negative environmental and social impacts that are characteristic of the current food system. ISSA decentralizes food supplies, relieving pressure on rural farms and increasing the nation's food security. ISSA also provides additional benefits, such as economic vitality, community empowerment and beautification, improved health and nutrition, skill acquisition, and educational opportunities (Knowd et al., 2005).

### *Types of ISSA*

Due to the broadness of its nature, Innovative Small-Scale Agriculture can vary based on the differing factors that are specific to each case and context. Variations are dependent on: overall scale, location, people power, funding source(s), type of agriculture produced, production techniques, and market outlets (Kaufman & Bailkey, 2000).

The overall scale of ISSA operations changes depending on the size and type of site, as well as the resources available for its development and maintenance (e.g. staffing, equipment, funding). The location of ISSA can occur within intra-urban, peri-urban or sub-urban areas, and can be organized and run by individuals, community groups, food-based organizations, social service providers, educational institutions, etc. They can function either as an informal operation, or as a formally established non-profit or for-profit. The amount and type of staffing (e.g. paid or volunteer) also fluctuates between different ISSA examples. Funding varies based on amount and source, ranging anywhere from large grants to personal donations. The type of products produced through ISSA methods also differ (e.g. fruit, vegetables, animal products, etc.), as do the growing techniques (e.g. organic, raised beds, hydroponics, greenhouse or hoop house, etc.). If the ISSA operation caters to more than just personal consumption, the products can be sold at farmers markets, to restaurants, grocery stores, community-supported agriculture, etc. (Kaufman & Bailkey, 2000)

Although such diversity exists within Innovative Small-Scale Agriculture, inherent similarities result in the ability to categorize different forms of ISSA. The most common categories of ISSA include:

- **Urban agriculture** – refers to “the production of food and nonfood plant and tree crops, as well as animal husbandry, both within and fringing urban areas” (Kaufman & Bailkey, 2000); often occurs on

vacant lots, or privately owned land within urban areas (Zones T3 - T6, DA). (To be elaborated on at a later date)

- **Community or Allotment gardens** – refers to agriculture that is undertaken by a conglomeration of community members, for a shared goal or set of goals; can occur in both urban and sub-urban settings (Zones T3 - T6). (To be elaborated on at a later date)
- **Edible landscapes** – refers to the incorporation of agriculture into constructed landscapes, mostly in residential settings but also has the capacity of being developed in urban landscaping as well (Zones T3 - T6, DA) (Beck & Quigley, 2001). (To be elaborated on at a later date)
- **Architectural agriculture** – refers to rooftops, walls, balconies, containers, and any other form of the built environment that can be used as a basis to grow food; most often utilized in areas of high-density (Zones T4 - T6). (To be elaborated on at a later date)
- **Schoolyard gardens** – refers to the incorporation of agriculture into educational settings as “living laboratories” (Tucker, 1993); can be implemented wherever schools are located (Zones T3 – T5). (To be elaborated on at a later date)

No single form of ISSA is more beneficial than another. Rather, each type caters to the varying settings and resources available for ISSA projects. Multiple forms of ISSA can also be incorporated into a given setting simultaneously. For instance, it is possible to incorporate both edible landscaping and architectural agriculture into a suburban condominium development. Developers of ISSA should identify their resources and needs in order to appropriately determine which form or variety of forms of ISSA is best suited for the given situation. Employing a variety of types of ISSA across the U.S. will present the greatest promise for lessening dependence on the current food system, creating a smooth and successful transition towards a more sustainable alternative.

### **Small-scale Agriculture as a Solution to Past Food Shortages and Economic Strife**

Although “ISSA” is a new term, small-scale agriculture in itself is not a new idea. Rather, the trend of planting vegetables, at least in urban areas, dates back to the late 1800s (Goldstein, 1997). Over the past 115 years, the purpose and meaning of small-scale agriculture has evolved to meet the changing needs of society—providing a solution to economic hardship, food shortages, and urban deterioration (Bassett, 1981; Tucker, 1993). With the state of the current U.S. food system and economy in peril, referencing society’s response to similar challenges in the past reveals that the establishment of small-scale food gardens was often used as a solution to such strife.

Drawing such parallels strengthens the claim that the resurrection and expansion of small-scale agricultural can successfully combat the current challenges of the twenty-first century, and aid in the transition towards more sustainable alternatives.

### *Potato Patches*

The first wave of small-scale gardens in the United States were planted between 1894 and 1917 in response to bank and industry failures, capital flight, and the resulting bankruptcy and unemployment (Bassett, 1981; Warner, 1987). “Potato patches”—as most late 1800s and early 1900s small-scale gardens were called—were mainly created in response to urban poverty and unemployment that stemmed such economic difficulties (Goldstein, 1997; Warner, 1987). By 1895, vegetable gardens had sprung up in twenty different cities in order to provide urban residents with access to fresh produce (Kaufman & Bailkey, 2000). Detroit, a city that experienced significant unemployment and economic hardship during that time, invested nearly 3,000 dollars in an urban garden program, and had 945 families participate in small-scale gardening in the first year (Warner 1987). As a result, 14,000 bushels of potatoes were produced and 9,000 dollars in relief expenditures were saved for taxpayers (Warner 1987).

### *Liberty Gardens*

After World War I began in 1917, small-scale gardens were again seen as a solution to hardship, this time addressing food shortages, rising food costs, and the need to allocate products and resources to military endeavors (Goldstein 1997; Tucker 1993). President Woodrow Wilson supported these “liberty gardens” by creating a Committee on Public Information to assist “the Department of Agriculture in a War Garden Campaign to plant a million new backyard and vacant lot gardens” (Tucker 1993). A National War Garden Commission was also developed “to arouse the patriots of America to the importance of putting all idle land to work, to teach them how to do it, and to educate them to conserve by canning and drying all food that they could not use while fresh” (Pack, 1919). By 1918, more than 5 million Americans were involved in the liberty gardens movement, and helped to produce 520 million dollars worth of food (Warner, 1987).

### *Relief Gardens*

In response to the onset of the Great Depression in 1930, the idea of potato patches was resurrected by the American people in order to reduce economic hardship and stress, and provide a reliable source of affordable food (Tucker, 1993). To boost the prevalence of relief gardens across the nation, the Family Welfare Society and the Employment Relief Commission were created (Warman, 1999). In New York City, the welfare department and Works Progress Administration helped to turn more than 5,000 vacant lots into functional small-scale

gardens (Warner, 1987). By 1934, these gardens were able to turn one dollar into 5 dollars worth of vegetables, producing 2.8 million dollars worth of food in total (Tucker, 1993).

### *Victory Gardens*

After the conclusion of World War I, the leader of the National War Garden Commission, Charles Lathrop Pack, coined the term “victory gardens,” which was later adopted by the small-scale agriculture movement during the Second World War (Warner, 1987). Victory gardens highly resembled liberty gardens, in both purpose and success, and were prevalent from 1941 through 1945 (Bassett, 1981). To help bolster the small-scale gardening efforts, National and State Victory Garden Programs along with community-level Victory Garden Committees were created (Bassett, 1987; Mack et al., 1944). Government and civilian groups, such as the Red Cross and Scouts, distributed seeds, chemicals, and other resources, and made gardening classes and literature available to the public (Mack et al., 1944). Eleanor Roosevelt even planted a victory garden at the White House to set a precedent (Brown, 2009). In 1943, the small-scale agricultural endeavors of over 20 million Americans produced approximately eight million tons of vegetables (Mack et al., 1944). As popularity reached its peak in 1945, victory gardens were responsible for producing 44 percent of the produce consumed nationally (Bassett, 1981).

Although these small-scale agricultural endeavors in the United States were largely successful throughout history, once economic hardship or wartime ceased, so did the support and therefore existence of the gardens (Bassett, 1981).

### *The Community Gardening Movement*

After World War II concluded in 1945, the idea of victory gardens did not resurface in the mainstream until the end of the 1960s and beginning of the 1970s, during the community gardening movement. Gardens were planted as part of the “back to the land” movement, and were generally motivated by “ecology and economics, freshly picked vegetables, increased neighborliness, and a sense of success from overseeing an operation from inception to fruition.” (Bassett, 1981).

The community garden movement later expanded during the 1990s to include the restoration of vacant lots, which simultaneously helped to build community and a sense of place, deepen human’s relation to the natural world, and foster environmental stewardship (Bassett, 1981). As the amount of vacant land within cities continued to increase due to unsuccessful urban renewal, changing desires for housing, racial prejudices, and the migration of people out of cities and into the suburbs, the existence of small-scale gardens was further enlarged

(Schmelzkopf, 1995; Schukoske, n.d.). Rather than allowing the vacant land to collect trash or sit idle and unused, city residents began to optimize this space by creating urban gardens.

The resurgence of small-scale agriculture during the community gardening movement can also be credited to the increased need for food security within inner cities. Food availability is scarce in urban areas, as grocery stores are few and far between, and convenient stores fail to offer affordable, fresh and/or nutritious food (Sneed, 1998). To ensure food justice and security within cities, and to lessen agriculture's negative impact on the environment, some urban residents have taken it upon themselves to restructure the current food system by cultivating their own food in small-scale urban gardens. At the beginning of the new millennium, it was estimated that over 6,020 urban gardens existed across the United States, utilizing over 2 million community gardeners (Zimble, 2001).

Notable parallels exist between the gardens planted during in the past, and those that are currently being dug in the twenty-first century. Reviewing past small-scale agricultural efforts provides a deeper understanding of their purpose, evolution, and potential to contribute to a more sustainable food system in the twenty-first century and beyond. Just as Eleanor Roosevelt inspired the use of victory gardens in the Second World War, First Lady Michelle Obama recently reignited the possibility of popularizing such a solution by converting a portion of the White House lawn into a plot that could be categorized as Innovative Small-Scale Agriculture (Brown, 2009). Historical small-scale food gardens have proven to significantly contribute to countering economic hardship and providing reliable sources of nourishment to those in need (Bassett, 1981; Tucker, 1993; Warner, 1987). These past efforts have been beneficial for the environment, society, and economy, providing valid justification for the expansion of small-scale agricultural efforts and the programs necessary to support them in the twenty-first century. Such expansion is the principle idea behind Innovative Small-Scale Agriculture (ISSA).

### **Achieving a More Sustainable Alternative in the Twenty-first Century through ISSA**

The current industrialized food system in the United States continues to cause massive environmental, social, and economic damage. As the negative threats continue to amplify, so does the need for an alternative. Consumers' awareness of the issues associated with the current food system has also heightened, leading to concern about the degradation and depletion of resources, the collapse of local economies, and the continued threat of food insecurity. In response to such an unstable and damaging system, the need for a multifaceted transition towards a more sustainable alternative is mounting. The time for such a transition is now.

Although encouraging rural farmers to convert to small-scale organic means of production is an important transitory approach, it is but one part of the solution. Given that food is consumed by all human beings, it is

essential to include society as a whole as part of the solution by incorporating agriculture into common landscapes and spaces, which is the main purpose of Innovative Small-Scale Agriculture (ISSA).

Innovative Small-Scale Agriculture (ISSA) is a term used to describe the expansion of agriculture into intra-urban, peri-urban, and sub-urban zones of development. ISSA can be understood as an umbrella term that describes urban agriculture, community and/or allotment gardens, edible landscapes, schoolyard gardens, and architectural agriculture. Due to its diversity in scope, different ISSA operations vary based on the resources available in that particular context. ISSA production supplements rural and imported food supplies, contributing significantly to food security, food sovereignty, and food justice within the nation. By decentralizing and localizing the production, processing, marketing, distribution, and consumption associated with the food system, ISSA reduces the negative environmental and social impacts that are characteristic of the current food system. ISSA also provides additional benefits, such as economic vitality, community empowerment and beautification, improved health and nutrition, skill acquisition, and educational opportunities (Knowd et al., 2000).

Due to its versatility and multitude of benefits, ISSA should be seen as a key component in the sustainable food system transformation. To ensure maximum success, ISSA should be coupled with a variety of transitory modes, such as the division of large-scale farms and protecting farmland from development, the adoption of organic growing methods, the development of more localized producer and consumer relationships, the creation of zoning ordinances and policies to guarantee the longevity of sustainable agriculture endeavors, etc. (Bourque, 2000).

Innovative Small-Scale Agriculture (ISSA) places individuals in charge of their own food system by encouraging citizens within urban and sub-urban areas to come together and (re)connect with their nutrition and the natural environment. The resurrection and expansion of small-scale agriculture is an alternative to the current food system that offers a multitude of benefits to the environment, the economy, and society, and therefore should be utilized as a major mode of transition towards a more sustainable food system.

### **Future Research Directions**

Implementing and Endorsing Innovative Small-Scale Agriculture (ISSA)

*Benefits of ISSA*

*Obstacles associated with ISSA*

*Overcoming the Obstacles of ISSA*

Making the Transition

*The Need for Structured Support*

*A Call for a Social Movement*

Models of Hope: Current ISSA Endeavors

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