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Michelle Kay Phares

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**Measuring Impacts of Urban Agriculture Organizations on Community
Revitalization Efforts**

**APPROVED BY
SUPERVISING COMMITTEE:**

Supervisor:

Elizabeth Mueller

Katherine Lieberknecht

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Revitalization Efforts**

by

Michelle Kay Phares, B.A.

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Dedication

I would like to dedicate this to my mother, who never finished her degree like she wanted to, but became a willing student of the art of living a rich and wonderful life. I hope I achieve half as much as she.

I would also like to dedicate this to Michel...sweetheart, this is as much your degree as it is mine. Thank you for encouraging me to take chances, supporting me when I finally did, and having faith in my choices when logic would dictate otherwise.

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Abstract

Measuring Impacts of Urban Agriculture Organizations on Community Revitalization Efforts

Michelle Kay Phares, M.S.C.R.P.

The University of Texas at Austin, 2013

Supervisor: Elizabeth Mueller

Urban agriculture (UA) has been a recognized component of functioning urban landscapes since the beginning of civilization. Starting in the 20th century, formally recognized urban agriculture movements emerged in the form of victory gardens during both World Wars, and then again in the late 1970s through the creation of community gardens as a facet of social activism (Hodgson, 3). By the year 2000, urban agriculture was predominantly sponsored by local, mission-driven organizations created to promote social equity and provide economic opportunity for members of their respective communities (Hodgson, 3). The ongoing decrease in urban populations in de-industrialized cities, coupled with alarming rates of obesity, obesity related disease, malnutrition and a burgeoning awareness of food insecurity in distressed urban areas has sparked a growing interest in existing urban agricultural movements and their potential to serve as engines for economic and social revitalization. I intend to explore the implications of the popular urban agriculture revival in distressed communities and the role of UA organizations in ongoing economic and social revitalization efforts.

My research will focus on established UA organizations and their role in revitalization of distressed communities. Specifically, I will explore how urban agriculture organizations drive revitalization in distressed urban areas and how their impact on revitalization efforts are measured. Given the potential economic and social benefits of UA, it is important to look towards organizations utilizing successful models for implementation and how they are impacting broader revitalization efforts within their community. As part of my research, I will evaluate three well-established U.A organizations, with track records of success across 4 differing dimensions: economic, social, environmental, and systemic. The goal of my research is to identify and measure the impacts of UA organizations in relation to a set of broader outcomes associated with revitalization efforts.

Table of Contents

List of Tables	xii
List of Figures	xiv
List of Illustrations	xv
CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: URBAN AGRICULTURE: OVERVIEW AND BACKGROUND.....	1
Urban Agriculture: Defined	1
Urban Agriculture: Historical Background.....	3
The Modern Urban Agriculture Movement.....	8
The Scope of Modern Agriculture	8
Environmental Drivers.....	10
Social Drivers.....	12
Economic Drivers	14
Sustainability & Equity within the Emerging U.A. Paradigms	17
Sustainability.....	17
Equity	18
CHAPTER 3: LITERATURE REVIEW - IMPACT MEASUREMENT	20
Introduction.....	20
Prevailing Impact and Performance Assessment Models.....	21
Logic Models	22
Randomization	25

Assessment & Urban Agriculture	27
CHAPTER 4: METHODOLOGY.....	31
CHAPTER 5: CASE STUDIES	36
I. Growing Power – Milwaukee, WI.....	36
Urban Context: City of Milwaukee.....	36
Organizational Description: Growing Power.....	38
Overview.....	38
Mission.....	38
Vision.....	39
Infrastructure.....	39
Programs	40
Policy and Advocacy	41
Impacts Measured	42
II. Sustainable Food Center – Austin, TX.....	43
Urban Context: City of Austin.....	43
Organizational Description: Sustainable Food Center.....	45
Overview.....	45
Mission.....	45
Vision.....	45
Infrastructure.....	45
Programs	46
Policy and Advocacy	47
Impacts Measured	48
III. Massachusetts Avenue Project (MAP) – Buffalo, NY	50
Urban Context: City of Buffalo, NY.....	50
Organizational Description Growing Green/MAP	51
Overview & History.....	51
Mission.....	52
Vision.....	52

Infrastructure.....	52
Programs	53
Impacts Measured	54
CHAPTER 6: CLASSIFICATION & MEASUREMENT	56
Categories of Urban Agriculture Initiatives.....	56
Urban Agriculture: Defining Outcomes.....	59
Positive Outcomes	59
Negative Outcomes	62
Distilled Outcomes.....	64
Distilled Outcomes & Associated Impacts	66
Evaluation Template	71
CHAPTER 7: FINDINGS	72
Discussion.....	72
Urban Agriculture as a Community Revitalization Strategy	72
Measuring Urban Agriculture’s Impact on Revitalization Efforts	74
Conclusion	77
Urban Agriculture as a Driver of Community Revitalization.....	77
Measuring the Impacts of Urban Agriculture on Revitalization.....	78
Strategies to Maximize the Impact & Performance of Urban Agriculture Initiatives	79
Social Dimension	81
Economic Dimension.....	86
Environmental Dimension	90
Systemic Dimension	92

Appendix A: Evaluation Template	97
Appendix B: Interview Questionnaire (SFC)	99
Appendix C Interview Questionnaire (GP).....	101
Bibliography	103

List of Tables

Table 1: Outcomes Across Dimensions	65
Table 2: Impact Measures Across Dimensions and Outcomes.....	66
Table 3: Summary: Strategies to Maximize the Impact & Performance of Urban Agriculture Initiatives	80
Table 4: Social Detail: Strategy 1 to Maximize the Impact & Performance of Urban Agriculture Initiatives	81
Table 5: Social Detail: Strategy 2 to Maximize the Impact & Performance of Urban Agriculture Initiatives	82
Table 6: Social Detail: Strategy 3 to Maximize the Impact & Performance of Urban Agriculture Initiatives	83
Table 7: Social Detail: Strategy 4 to Maximize the Impact & Performance of Urban Agriculture Initiatives	84
Table 8: Social Detail: Strategy 5 to Maximize the Impact & Performance of Urban Agriculture Initiatives	85
Table 9: Economic Detail: Strategy 1 to Maximize the Impact & Performance of Urban Agriculture Initiatives	86
Table 10: Economic Detail: Strategy 2 to Maximize the Impact & Performance of Urban Agriculture Initiatives	87
Table 11: Economic Detail: Strategy 3 to Maximize the Impact & Performance of Urban Agriculture Initiatives	88
Table 12: Economic Detail: Strategy 4 to Maximize the Impact & Performance of Urban Agriculture Initiatives	89

Table 13: Environmental Detail: Strategy 1 to Maximize the Impact & Performance of Urban Agriculture Initiatives.....	90
Table 14: Environmental Detail: Strategy 2 to Maximize the Impact & Performance of Urban Agriculture Initiatives.....	91
Table 15: Systemic Detail: Strategy 1 to Maximize the Impact & Performance of Urban Agriculture Initiatives	92
Table 16: Systemic Detail: Strategy 2 to Maximize the Impact & Performance of Urban Agriculture Initiatives	93
Table 17: Systemic Detail: Strategy 3 to Maximize the Impact & Performance of Urban Agriculture Initiatives	94
Table 18: Systemic Detail: Strategy 4 to Maximize the Impact & Performance of Urban Agriculture Initiatives	95
Table 19: Systemic Detail: Strategy 5 to Maximize the Impact & Performance of Urban Agriculture Initiatives	96

List of Figures

Figure 1: Logic Framework Structure	22
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List of Illustrations

Illustration 1: Categories of Urban Agriculture initiatives	58
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CHAPTER 1: INTRODUCTION

Alarming rates of obesity across the nation and an increased awareness of food insecurity in major U.S. cities has brought the issue of access to affordable and nutritious food to the forefront of our cultural consciousness. According for the Centers for Disease Control, approximately 1/3 of the U.S. population is considered obese. Meanwhile, 15% of the U.S population is considered food insecure while an additional 5.7% of the population is considered to be very food insecure. Many U.S. cities contain areas, with little or no access to full scale grocery stores or fresh fruits and vegetables (Lovell, 2505). Considered food deserts, these urban areas are inundated with cheap, prepackaged and processed foods. Most sources of fresh, nutritious food are well out of reach for low income households or those living at or below the poverty line (Lovell, 2505).

Problems such as obesity and lack of access to healthy, affordable, culturally appropriate food have sparked a growing interest in urban agriculture, or the production, manufacturing and distribution of food within urban areas (Lovell, 2505). Although urban agriculture traces it formal roots back to the dawn of civilized society, a formal modern revival of domestic urban agriculture has taken root in some in the most economically depressed areas of the nation's de-industrialized cities. Residents and some local governments in cities such as Detroit, Cleveland, Milwaukee, and Chicago recognized the potential benefits of UA early on and took advantage of an abundance of cheap, vacant land to foster community based UA initiatives to address social, environmental and economic inequities affecting their communities.

Many of these initiatives are in existence today and serve as national models of urban agricultural production and service provision. These initiatives provide access to healthy food, education regarding nutrition, and firsthand knowledge of food production

to neighborhood residents (Lovell, 2505). They also serve as engines for community involvement, workforce development, as well as, revenue generators (Lovell, 2505). They are credited with improving the sustainability of localized food systems through waste recycling, storm water reuse and reduced energy requirements for food growth, production, transport and storage (Lovell, 2505). Many of these initiatives attract both public and private investment and serve as catalysts for municipal policy and planning initiatives, with the potential to generate positive social, economic and environmental impacts at the local and global level.

As with any complex system, there are also host of negative side effects associated with urban agriculture. Poorly executed or socially and environmentally irresponsible urban agriculture initiatives can accelerate gentrification of low-income or minority neighborhoods, create public health hazards, and result in the exploitation of minority or low income populations. However, I believe that the potential benefits of UA warrant further examination of urban agriculture initiatives and the impacts of their implementation in distressed urban areas. I contend that, in its most efficient and responsible form, urban agriculture contributes significantly to social and economic revitalization efforts within distressed communities. To that end, this report will examine how urban agriculture initiatives across the U.S. impact revitalization efforts in urban areas and discuss a model for identification, categorization and measurement of impacts associated with UA outcomes.

CHAPTER 2: URBAN AGRICULTURE: OVERVIEW AND BACKGROUND

The following is a general overview of the current urban agriculture movement, its historical background and a discussion of the modern revival of UA, including its modern context and current drivers. This overview is intended to describe the current manifestation of urban agriculture, and its primary characteristics, typologies, and methods of implementation. It also delves into the history of domestic urban agriculture and explores the contemporary context of urban agriculture, including the historical forces that shaped 21st century urban agriculture movement and the social, economic and environmental factors that drive modern urban agriculture initiatives across the United States today. Lastly, the overview will explore equity and sustainability as defining characteristics of emerging urban agriculture paradigms. The general overview sets the stage for a discussion of how urban agriculture drives revitalization in distressed urban areas and provides context for exploration and analysis of three specific urban agriculture organizations in the impact assessment portion of this report.

Urban Agriculture: Defined

According to the Community Food Security Coalition, urban and peri-urban agriculture refers to “the production, distribution and marketing of food and other products within the cores of metropolitan areas” (Hodgson, et al, 14). It exists in multiple forms and has a multitude of purposes, including not only production of food, but processing, distribution and marketing of food related products within the urban core (Hodgson, et al, 14). Current incarnations of urban agriculture are typically categorized

into three overarching uses: commercial, non commercial and hybrid uses (Hodgson, et al, 16). Non-commercial uses include private, community, institutional, demonstration and guerrilla gardens, as well as edible landscaping and hobby chicken and bee keeping (Hodgson, et al, 16). Commercial uses include market gardens, urban and peri-urban farms, beekeeping and chicken keeping operations, aquaponic and hydroponic systems ((Hodgson, et al, 16). Hybrid uses are social enterprises involving any combination of food production, processing, distribution, or marketing integrated with educational activities. These organizations can be mission driven, entrepreneurial in nature, or a combination of both.

Urban agriculture is implemented for a variety of reasons, but is generally intended for personal consumption or use, for personal/commercial sales, donation, educational or demonstration purposes, healing or therapeutic practices, or neighborhood revitalization and economic development (Hodgson, et al, 3). In terms of location, urban agriculture (including production, processing, and sale or products) generally occurs on vacant public or private land or in existing residential, commercial or industrial areas in underutilized spaces (Hodgson, et al, 3). In cities with little vacant land, a long history of industrial pollution or high land costs, urban agriculture is often implemented in abandoned or repurposed spaces such as rooftops, balconies, utility right-of-ways, walls, or vacant industrial structures. Given the wide array of both traditional and non-traditional settings, urban agriculture initiatives use a variety of production techniques, including in-soil or raised-bed cultivation, hoop house or greenhouse growing, hydroponics, aquaponics, permaculture, or vertical farming (Hodgson, et al, 3). Ultimately, there is endless variation in purpose, location, size, scale, production techniques, and end products of urban agriculture activities, and activities are constantly evolving to fit the parameters of the urban environment (Hodgson, et al, 3).

Seen from a broader perspective, UA can be described as complex and self-contained system embedded within a larger food-system continuum (Hodgson, et al, 1). Implementation of UA often occurs in the shadow of the industrial food complex and can be interpreted as a local response to the failure of commercial food systems and municipal planning to meet the needs of underserved populations or communities within urban areas. Although, urban agriculture addresses specific problems such as food insecurity and obesity, it is inextricably linked to larger issues surrounding the economic and social well being of urban communities, such as neighborhood development, environmental sustainability, social equity, economic development, and human health (Hodgson, et al, 1).

Urban Agriculture: Historical Background

Food production has played an integral role in human settlements since the beginning of recorded civilization (Steele, 301-323). Purposeful cultivation and harvesting of grains allowed for storage of food in sufficient quantities to allow for the establishment of the world's first permanent villages in 10,000 B.C. and it's first permanent cities in 3,500 B.C. (Steele, 301-323). Since then, cultivated peri-urban farm belts forming an endless sprawl of commercial farms, and household subsistence garden/livestock activities were both defining features of cities and urban settlements around the world, well into the 19th century (Steele, 413).

The transition from an agricultural to an industrial economy in the U.S. began in the early 1790's and continued throughout the 19th century. This period marked the beginning of a movement from man made products to machine made products through advances in production processes, organizational techniques and technology. The impact

of advanced technologies and improved production on American society was three-fold. First, technological advancements, such as railroads removed any spatial constraints on agriculture and pushed a large portion of modern food production to the vast prairie expanses of the American Midwest (Steele, 644-649). Second advances in cultivation technology and processes allowed for increased agricultural productivity leading to the creation of modern commercial/industrial farming. Subsequently, the advent of large scale mechanized monoculture operations led to a decrease in the number of smaller farms needed to meet demand and an increased concentration of production on large farms with substantially less manpower. Third, technological advances and improved production and organizational processes outside of agriculture led to the birth of modern industry in America's rapidly growing urban centers. As opportunities for rural employment dwindled and cities became centers for industry and production, rural inhabitants flocked to urban areas seeking a new life. This rural-urban migration, known as urbanization, changed not only the American cultural identity, but the geography of agriculture as well.

Despite these changes, urban agriculture in the form of household and community gardens persisted throughout the industrial revolution, albeit waxing and waning in popularity. In 1893 a nationwide financial panic and subsequent economic depression set the stage for a popular revival of urban agriculture and inspired the first recognized use of urban agriculture as a means of economic and social revitalization. In 1894, Detroit Mayor Hazen Pingree implemented a municipal garden program on the city's vacant parcels in an effort to alleviate high unemployment (Hodgson, 2-3). Within two years, approximately half of Detroit's households were growing food on underutilized parcels on the borders of Detroit proper (Hodgson, 2-3). Based on the program's success, similar programs were instituted in other cities like New York and Philadelphia. In 1898, a

report for the New York Association for Improving the Condition of the Poor reported similar garden programs in 19 cities across the United States (Hodgson, 2-3). During this time, inner-city settlement houses integrated agriculture and food production with social reform and community development efforts by operating gardens in tandem with cooking and food processing programs to support poor or immigrant families (Hodgson, et al, 10).

Settlement houses played a similar role in urban agriculture movements of the early 20th century. Food shortages resulting from the Great Depression, urged many urbanites to create gardens as a source of food or flee to commercial growing operations on the edges of cities looking for employment (Lovell, 2505). In the 1940s, the U.S. government encouraged both rural and urban Americans to plant victory gardens in response to the food shortages experienced during World War's I and II (Hodgson, 2-3). According to estimates from 1943, some 20 million citizens cultivated gardens on both private and public land yielding an estimated 9-10 million tons of fruits and vegetables, or just under half (41%) of all vegetables produced in that year (Hodgson, 2-3). However, the economic boom and, subsequent, population growth that occurred after World War II pushed most agriculture activities past the periphery of most U.S. cities for good (Hodgson, et al, 11)..

In the 1920s, regional planners sought to mitigate the overcrowding and public health issues associated with urban industrial life by reconnecting the urban food system with agricultural producers from the surrounding agricultural areas, much like Ebenezer Howard's Garden City concept (Campbell, 345). Planning efforts that began in the early 20th century as a means to regulate intensive agricultural uses in the name of public health and safety, evolved into a formalized response known as zoning (Hodgson, et al, 12). By the mid-20th century, zoning codes had virtually eliminated agricultural uses from the urban landscape in order to make way for residential development (Hodgson, et al, 12).

Aspects of Howard's Garden City concept resurfaced again in the form of the *environmental justice movement*, as a broader interest in environmental conditions emerged (Campbell, 345). In the 1960's, people's concerns about the effects of pesticides and other agricultural chemicals in conjunction pressures from deindustrialization, depopulation, immigration and the failure of urban renewal prompted a renaissance in community gardens (Campbell, 345). The community gardening movement took hold in primarily immigrant and minority communities before being institutionalized by governments and non-profits as a vehicle for social movements and community development efforts in the late 1970s (Hodgson, et al, 12). This movement's strong emphasis on community empowerment, social justice, and the reduction of environmental risks to minority and rural populations finds parallels in the current sustainable agriculture movement (Campbell, 345).

What began in the 1970s as government sponsored USDA extension projects with agents across the country, transformed into thousands of community gardens in cities such as New York and Philadelphia by the mid 1990s (Hodgson, et al, 12). During this time frame, planning agencies in some of the nations largest cities (Chicago, New York, Boston) began to recognize the potential benefits of urban agriculture and supported allocation of land for gardening purposes (Hodgson, et al, 12). Not surprisingly, as cities began to recover and land prices began to rise, access to land became a political hotbed with competing public, private and non-profit interests each vying for access to land with mixed results (Hodgson, et al, 13). Public and private institutions in some cities led successful preservation efforts which set aside land for community gardens (Hodgson, et al, 13). However, most cities took a less involved and systematic approach resulting substantial losses of agricultural land or gardens established with temporary use permits on publicly held vacant land intended only as an interim use (Hodgson, et al, 13). By the

year 2000, urban agriculture was predominantly sponsored by local, mission-driven non-profits that provided either products, services, or a combination of both intended to promote social equity and create economic opportunity for the surrounding community (Hodgson, 3).

Today's urban agriculture initiatives have a decidedly brief history, with the earliest projects coming into existence no more than twenty years ago (FIC, 10). However, both community gardens and urban farm initiatives have experienced a notable rise in popularity in the last decade, due to increases in demand for locally grown and socially conscious food products. Some attribute this cultural shift to changes in the popular perception of food and food access. Food access is now viewed as inextricably linked to factors such as economic development, social justice, environmental quality, ecological integrity, and human health (Hinrichs, 36). This holistic approach to food systems, known by some as the "community food security movement" entails providing "access to affordable, nutritious, and culturally appropriate food for all people at all times" in the context of "a system of growing, manufacturing, processing, making available, and selling food that is regionally based and grounded in the principles of justice, democracy, and sustainability" (Campbell, 346). Understanding that local food systems operate within the larger commercial food complex, modern urban agriculture initiatives strive to operate within a sustainable framework that localizes all aspects of food production from cultivation to waste. Within this framework, work is directed at community-level change in food sources and resources, transportation and food access, nutrition and dietary health, food safety, employment opportunities in food production, and reduction of environmental hazards in food production and processing (Campbell, 246). Using this approach, modern urban agriculture initiatives have found a holistic solution to the economic and social inequities affecting their communities by combining

valued products (fresh, nutritious food, food related products, and repurposed waste streams) with a process potentially rich in social benefits (FIC, 10).

The Modern Urban Agriculture Movement

THE SCOPE OF MODERN AGRICULTURE

Under the prevailing food production regime, commercial agriculture operations cultivate the vast majority of commodity crops and livestock, which form the basis of almost all food known products. In the United States, commercial agriculture is characterized predominantly by small family-owned farms. According to the USDA's Economic Research Service, over 97% of U.S. commercial farms are family farms (where the majority of the business is owned by the operator and individuals related to the operator), with approximately 90% of those classified as small operations (having less than \$350,000 in gross cash farm income, or GCFI). However, these small farms represent only 25% of the actual value of production (USDA). Like other parts of the world, U.S agricultural production is dominated by a small number of medium to large scale commercial or contract operations (USDA). Large scale family farms (with \$1 million or more in GCFI), only account for about 2% of all farms, but represent a disproportionately large (35%) share of the value of production (USDA).

In response to a number of economic and cultural forces, the demand for locally grown, organic products is changing the scope of agricultural production. Available data on urban agriculture initiatives indicates a marked increase in local urban agricultural activities. The National Gardening Association (NGA) estimates that the number of households maintaining backyard gardens increased nationally from 36 million to 46 million in 2009 (up 19% from 2008) and that approximately 57% of the food gardens in

2009 were less than 100 square feet in size. Accurate totals for the number of community gardens currently in existence are difficult to come by, due to their informal nature (Raja, et. al, 9). However, the American Community Gardening Association estimates there are about 18,000 community gardens in the U.S. and Canada (Raja, et. al, 9). In “A Planners Guide to Community and Regional Food Planning: Transforming Food Environments, Facilitating Healthy Eating”, Raja et. al., speak to the current and future potential of community gardens for increasing access to healthy food in low income neighborhoods, citing Ohio as an example (Raja, et. al, 9). In Ohio, 337 urban gardens generated an annual harvest worth about \$1 million, with well over three-fourths (86%) of these gardens dedicated to food production for direct consumption, versus for sale at markets: “On average, 44 percent of the food grown at these gardens was consumed by gardeners’ immediate family members, another 20 percent was shared with other family members and friends, 13 percent was donated to food pantries, 20 percent was consumed on-site, and about 2 percent sold to grocery stores, restaurants, and other outlets” (Raja, et. al, 9). It is worth noting that three-fourths of community gardeners in Ohio self-identified as low-income. (Raja, et. al, 9).

According to the USDA, there were more than 400 Community Supported Agriculture (CSA) initiatives in the U.S. in 1993, many of which were located mainly near urban centers in New England, the Mid-Atlantic states and the Great Lakes region. According to the USDA’s Census of Agriculture (2009), more than 12,500 U.S. farms reported marketing products through a CSA in 2007, representing a dramatic increase in CSA activity in the last 20 years. Similarly, as of mid-2011, there were 7,175 farmers’ markets operating throughout the United States, representing a 17% increase from 2010 and a 309% increase since 1994 (Bradshaw, 254). Although, a nationwide accounting of urban and peri-urban farms does not yet exist, the prevalence farmer’s markets

nationwide, alludes to a significant increase in the number of urban or peri-urban farms, needed to accommodate the demand for food products sold at farmer's markets.

As mentioned above, produce from community gardens in Ohio represented a tiny fraction of food sold to market (0.01%) (Raja, et. al, 9). Assuming this percentage is generally representative of the larger universe of local farmer's markets nationwide, the increased prevalence of farmer's markets in the last 20 years suggests a significant increase in urban and peri-urban farms. Data on farm-to-market programs also suggests a substantial increase in urban and peri-urban farm activity. Estimates from the Center for Food and Justice at Occidental College indicate that a substantial number of cities and communities have established farm-to-school programs in conjunction with local farms: 38 states, 769 school districts, and 10,991 schools are currently operating 1,118 farm-to-school programs in the U.S. (Raja, et. al, 15). The sheer number of urban agriculture initiatives, in conjunction with well-documented increases in incidence and overall expansion of urban agriculture typologies indicates the presence of an expanding localized food system. Although, local food systems have always existed in urban settings, in one form or another, a number of historical and contemporary forces have collided to create a popular cultural shift from commercially produced food to locally produced, organic food.

ENVIRONMENTAL DRIVERS

The revival of urban agriculture and the popular demand for locally grown organic food is often viewed as a direct response to the environmental legacy of commercial agriculture. The birth of commercial agriculture in the United States can be traced back the advent of modern agricultural practices in the mid 20th century (Peters, 208). World food shortages in the 1940's spurred research and development of science

based technologies to increase the productivity of land for agricultural use (Peters, 208). This movement, called the “Green Revolution” continued from the 1950’s through the 1970s and served a catalyst for new farming methods including high yield crops, large monoculture farms, widespread use of chemical pesticides and fertilizers and breakthroughs in mechanization and irrigation (Peters, 208).

Although these new methods and technologies vastly increased food production in the decades that followed, the long term effects of modern commercial farming began to reveal themselves in the form of groundwater contamination from chemical pesticides and fertilizers, soil erosion and depletion of soil nutrients caused by unsound cropping practices, destruction of pollinators such as bees, increased economic risk stemming from a reliance on monocrops and side effects on humans from agrochemicals (Peters, 208). According to the Environmental Protection Agency (EPA), more than half of the groundwater pollution in the U.S. can be attributed to agricultural runoff containing chemical pesticides, fertilizers and manure.

In large part, this is due to mechanized application methods, which cause excessive contamination of the surrounding soil and groundwater water (Peters, 210). This form of pollution encourages massive blooms of deadly algae in the Gulf of Mexico known as “dead zones”, as well as and drastic declines in soil fertility (Peters, 209-210). As chemical pesticides permeate the soil and groundwater, they degrade soil fertility levels, resulting in increased use of chemical fertilizers to achieve optimal yields (Peters, 210). As pests and insects become resistant to pesticides, farmers must increase dosage and lethality, destroying native and beneficial insects such as bees (Peters, 210). Lastly, large scale production methods focus on the cultivation of single crops, resulting in over-cultivated land, loss of topsoil, erosion, depletion of soil nutrients, loss of biodiversity, increased agricultural waste and increased use of chemicals.

It is no wonder then, that Americans are now seeking out alternative food options in droves. The perception that locally produced organic foods are “better” than commercial monoculture products is gaining momentum. People are increasingly willing to pay a premium for non-toxic, genetically unadulterated and environmentally conscious products. This consciousness extends far beyond concerns about toxicity and groundwater pollution. A whole new spectrum of environmental issues associated with carbon emissions is at the forefront of the environmental agenda. Currently, food related emissions in the U.S. account for 21% of total emissions (Jones). Additionally, food related emissions account for 15% of personal transportation emissions, 20% of home energy use emissions, and 23% of the aggregate remaining emissions (Jones). Consumer activities such as driving to the grocery store, eating at restaurants, and cooking make up approximately 46% of emissions linked directly to food, while the other 54% of emissions are derived from the production, distribution, storage and sale of food (Jones). The average meal has traveled 4,200 miles and food related emissions account for 28% of all U.S. landfill emissions (Jones). Unlike environmental contamination, which is often site specific, carbon emissions affect everyone. Urban agriculture initiatives represent a local response to this global concern.

SOCIAL DRIVERS

The dramatic gains in productivity derived from commercial monoculture provide cheap and readily available food commodities to American consumers and form the basis of almost all animal feeds used in U.S. factory farming. (Bradshaw, 248). The economies of scale associated with commercial food production may provide millions of people with access to cheaper meals, but often at the expense of the consumer who sacrifices quality for quantity when they rely on mass produced and processed foods as their primary

source of nutrition. Paradoxically, the culture of plenty created by the west's dominant food production regime is arguably the largest contributor to localized food insecurity and an obesity epidemic that affects their mental, physical, economic, and social well being of millions of Americans.

According to the Centers for Disease Control, one third of U.S. adults are obese. Meanwhile, approximately 15% of American households were food insecure in 2011 with another 5.7% of households categorized as very food insecure. One thing that links both of these populations is poverty. Low income households and individuals living at or below the poverty level both experience disproportionately high levels of food insecurity and obesity (Drenowski, Specter). According to the U.S. Census Bureau, approximately 15% of the U.S. population lives at or below the poverty level. Of those living in poverty, 83% live inside metropolitan statistical areas (Center for Poverty Research). Given the distribution of poverty across geographies, it is no surprise that obesity and food insecurity occur in a disproportionately large number of low income individuals living in urban areas.

One contributing factor to both obesity and food insecurity among low income households in urban areas is access, or lack thereof. According to the USDA, 10.1 million low-income individuals (20.2%) were more than 1 mile from the nearest supermarket. Of the total, 3.6 million lived in low-income areas (USDA, 35). Within urban clusters, 1.4 million persons, or 29.3 % of the low-income population, were more than 1 mile from the nearest supermarket (USDA, 35). The term food desert, defined by the 2008 Farm Bill as an "area in the United States with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower income neighborhoods and communities", further codifies the link between the lack of access and low income status.

Food deserts literature suggests that those who have better access to supermarkets tend to have healthier diets and lower levels of obesity and related diseases (Beaulac et al., 2009; Larson et al., 2009). However, viewing problems such as food insecurity and obesity in relation to access alone, can be misleading. Evaluating access to food in relation to factors such as neighborhoods and household socioeconomic environments is critical to a holistic understanding of nature of food availability (USDA, 47). According to the USDA, low-access to supermarkets is most heavily influenced by characteristics such as the extent of income inequality, racial segregation, transportation infrastructure, housing vacancies, household deprivation, and rurality (USDA, 47). The USDA access report notes that risk factors for obesity, such as low-income in conjunction with lack of knowledge about basic nutrition are amplified by exposure to a food retail environment filled with a variety of cheap unhealthy alternatives to nutritious food (USDA, 39). Not surprisingly, urban areas, characterized by geographic concentrations of low income residents with little to no nutritional literacy and low levels of access to healthful options, have become the birthplace of the modern urban agriculture movement. Just as concerns about pollution, conservation and food safety have catalyzed the demand for locally grown organic products, (for who can pay a premium to buy them), concerns about public health associated with obesity related diseases have created a desperate need for increased education and economic self sufficiency, as well as healthful food options for low income populations in the urban core.

ECONOMIC DRIVERS

The growing awareness of urban agriculture and the increased demand for locally grown food in America has economic underpinnings as well. According to the USDA, the demand for locally grown food will grow from a \$4 billion market in 2002 to a \$7

billion market in 2012 (Mogk). Additionally, approximately every \$1 invested in a community garden yields \$6 worth of fruits and vegetables (Mogk). Researchers in Ohio estimate that “urban farmers can gross up to \$90,000 per acre by selecting the right crops and growing techniques” (Mogk). In Philadelphia, it is estimated that “urban market gardens” earn up to \$68,000 per half acre. Projections for locally grown fruits and vegetables in Detroit predict almost \$200 million in sales and the creation of approximately 5,000 jobs (Mogk). The economic potential for urban agriculture in these cities and other like them is enormous and people are beginning to notice.

Some of this attention can be also attributed to a growing national awareness of “green industry”. Although the notion of a “Green Economy” traces its origins to the late 1970’s, it wasn’t until 2009, when the American Recovery Act (ARA) allocated almost \$167 billion in grants and loan guarantees for clean energy and conservation, that the idea of “green” products and services gained momentum once again. Included in the category of green goods and services are “products and services related to organic agriculture” (BLS, 2013). Four years after ARA, the green sector appears to have taken hold. According to Bureau of Labor Statistics data, in 2010, 3.1 million jobs in the U.S. were associated with the production of green goods and services, accounting for 2.4 % of total U.S. employment in that year. Of the total, 2.3 million jobs were in the private sector, and 860,300 in the public sector (Cohen). Green products and services are increasingly important to the U.S. and global markets as well (Cohen). Sales of environmentally friendly products in the U.S. exceeded \$40 billion last year, according to data from various market tracking services and Advertising Age estimates (Cohen). This includes \$29.2 billion for organic food (Neff, 2012). Given the market potential within the green economy and the growing demand for green products (including food products), the most influential driver for contemporary urban agriculture may be an economic one.

The economic potential for urban agriculture is particularly important for cities struggling in the wake of the de-industrialization and the recent economic crises. Known as “shrinking cities”, many post industrial centers are experiencing a disproportionately large share of economic distress resulting from the current economic depression. Characterized by high levels of unemployment, vast swaths of vacant land and populations in decline, these cities have proven to be an ideal breeding ground for urban agriculture initiatives. Many of these initiatives, provide not only income and employment to local residents, but serve as catalysts for community investment and capacity building. Until recently, the economic impact of these initiatives and urban agriculture in general was purely anecdotal. However, the remarkable success and national recognition of organizations such as Growing Power in Milwaukee has prompted researchers and government officials across the nation to examine the growing demand for locally grown food products and the potential economic impact of the urban agriculture sector in their respective cities.

Ultimately, a combination of environmental, economic, and social drivers have conspired to take what was once a small grass roots urban agriculture movement to a new level. These drivers have created a cultural shift; one in which the demand for locally grown healthful organic food is also tied to environmental, economic and social sustainability and equity. The resulting manifestation is an urban agriculture movement that exists alongside the dominant food system in an attempt to mitigate its worst side effects and perhaps establish a new, more sustainable food production paradigm that can aid in urban revitalization efforts.

SUSTAINABILITY & EQUITY WITHIN THE EMERGING U.A. PARADIGMS

Urban agriculture initiatives can realize a number of positive impacts, and with careful planning, mitigate any negative outcomes. Despite an almost complete lack of planning infrastructure, a variety of model urban agriculture initiatives have emerged in some of the nation's most economically distressed areas. Many of these initiatives are decades old and have made significant contributions to the social, cultural, economic, environmental well being of their surrounding communities. Capitalizing on the success of these pioneering urban agriculture initiatives and a surplus of vacant land, a wave of similar organizations have blossomed in city centers in the last several years. By design or by accident, many of these initiatives have developed and implemented their operations in accordance with a set of practices grounded in the principles of sustainability and equity. These two concepts are integral to successful and responsible urban agriculture initiatives involved in larger community revitalization efforts. Given the growing number of urban agriculture initiatives in our nation's cities, it is imperative to establish a concrete framework for equitable and sustainable models of urban agriculture.

Sustainability

In order to meet the goal of sustainability, urban agriculture organizations must be environmentally sustainable. Environmentally sustainable urban agriculture initiatives often use safe, non-toxic, and organic means of cultivation and socially conscious production, packaging and distribution practices. Many would argue that urban agriculture, by default, is environmentally sustainable, as compared to commercial agriculture because it reduces the amount of waste deposited in landfills, lowers greenhouse gas emissions, and eliminates the use of packaging plastics and fossil fuels used to transport product to market (Bradshaw, 257). However, I argue, that

environmentally conscious initiatives must advance one step further, by using non-toxic, chemical free insecticide, pesticide and fertilizer treatments as well as re-use of agricultural runoff. Eco-conscious initiatives must also engage in waste stream recycling and must maximize use of valuable urban green space using high yield techniques. Environmentally sound initiatives typically utilize production and packaging processes that minimize solid waste by products and rely in green energy for power. Lastly, they use noise and odor mitigation practices to prevent noise and odor pollution from adversely affecting the community and take measures to protect public health.

Equity

Along with promoting sustainability, it is important to pursue equitable outcomes along the environmental, economic and social dimensions of the urban agriculture movement. Low income communities, with large amounts of cheap, readily available land, represent the ideal setting for urban agriculture. However, low income communities already suffer from array of economic, environmental and social disadvantages stemming from institutionalized racial segregation and socio-economic inequalities. Urban agriculture can serve as an equalizer in a variety of ways, but only if deployed with careful consideration and planning.

Low income communities often bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental or commercial uses. Many low income neighborhoods are home to a large share of racial minorities and other marginalized populations with little political or economic clout and even less say about planning and development activity that occurs in their community. As a result, their neighborhoods have a long history as “dumping grounds” for a litany of unsavory and sometimes dangerous land uses. Urban agriculture initiatives embedded within low income communities are responsible for ensuring that the byproducts of their operations

do not adversely affect the immediate environment and are careful to not to reinforce or perpetuate existing geographic inequalities.

Economic equity refers to the idea that economic growth and development must be integrated into urban agriculture efforts and should promote “both intergenerational and intragenerational equity” (Bradshaw, 258). Urban agriculture must give individual residents and the community at large, the opportunity to increase economic productivity and provide a venue for residents to acquire and hone job skills and earn income (Bradshaw, 258). Urban agriculture initiatives must be careful not to enter into an exploitative relationship with the community and residents, whereby outside farmers take advantage of cheap land and provide no economic benefit to the surrounding community in return. The premise of social equity dictates that all members of society are entitled to quality of life and access to resources and development opportunities to further advance quality of life (Bradshaw, 258-259). Social equity also implies that a well-planned urban agricultural initiative must advance socioeconomic equality, promote natural resource sustainability, and improve the quality of life of its residents by promoting self-sufficiency from within (Bradshaw, 258-259).

Integrating the concepts of both sustainability and equity into urban agriculture is a relatively new phenomenon. However, the presence of these two elements has come to define the 21st century urban agriculture movement and is central to establishing a modern framework for measuring the impacts of urban agriculture on community revitalization efforts.

CHAPTER 3: LITERATURE REVIEW - IMPACT MEASUREMENT

Introduction

Unlike private sector or entrepreneurial organizations, which base success, largely on meeting financial objectives, mission driven organizations are created with specific service-oriented goals in mind. As such, each organization's policies, procedures and programs should be designed to meet these goals in the most effective and efficient manner possible. Optimal deployment of policies, procedures and programs would, ideally, result in optimal impacts and outcomes. However, given the grassroots origins and lack of funding that characterizes most non-profits, this is not always the case. Additionally, just as private organizations are accountable to clients, investors or shareholders, non-profit organizations are accountable to their members, boards, funders and the community at large.

The element of public accountability is an important distinction between for-profit and non-profit organizations. As recipients of substantial indirect subsidy (due to their non-profit tax status) and direct funding via grants and public investment, non-profits are held to an exceptionally high standard in terms of performance and accountability. According to the National Center for Charitable Statistics, approximately 22% of non-profit revenues come directly from contributions, gifts and government grants. In terms of indirect funding, savings from property tax exemptions generally equal 2% of total non-profit revenues (LILP, 17). However, for small non-profits, that own real property and report revenues below \$100,000, property tax exemptions equal, on average, 54% of total revenues (LILP, 17). Small to medium sized non-profits (revenue below \$500,000) receive property tax exemptions that equal, on average, 11% of total revenues (LILP, 17).

As stewards of limited public funding, recipients of significant indirect subsidy and providers of critical, safety net services, non-profits are subject to special scrutiny surrounding the ultimate impacts of public funding. Given the opportunity cost of mismanaged resources and the critical role that non-profits play in providing support services, it is important to be able to evaluate the impact of non-profit initiatives on the communities they serve.

This Chapter explores prevailing impact assessment models and the potential application of these models to domestic, mission driven urban agriculture initiatives. It speaks to the current status of impact assessment within the field of urban agriculture in the United States, as well as urban agriculture in an international setting. The purpose of this review is to describe the universe of impact assessment, its potential application in the field of urban agriculture, and the relevance of impact measurement in urban agriculture as it relates to revitalization efforts.

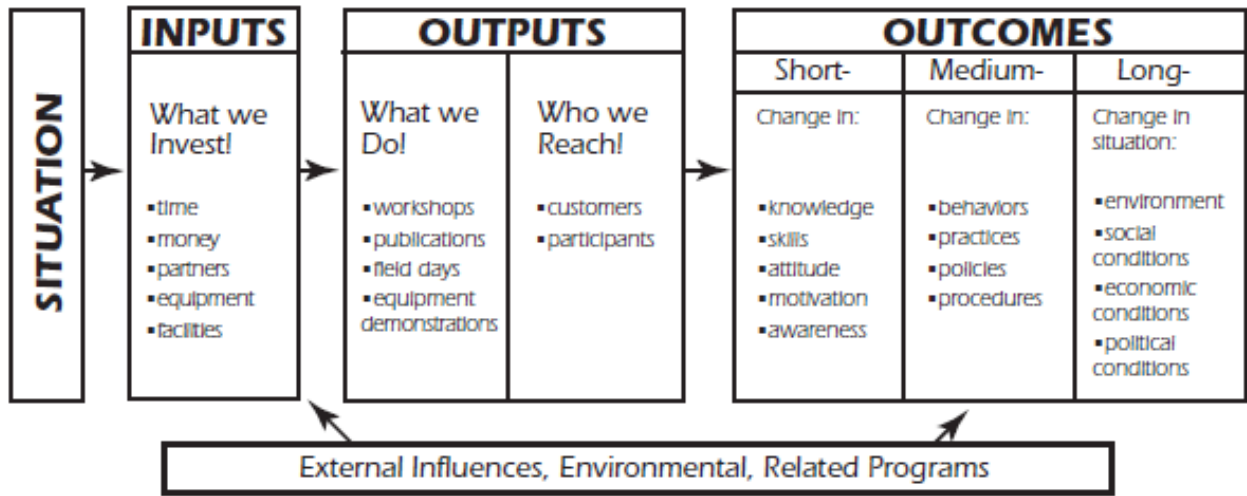
Prevailing Impact and Performance Assessment Models

This report will help examine the impact of mission driven urban agriculture initiatives on revitalization efforts by developing a framework for assessing impacts as they relate to desired outcomes. This method is distinct from the prevailing Impact Evaluation (IE) and Monitoring and Evaluation models (Logic models and Randomized Control Trials) that have dominated performance measurement in fields such as international development for the last 20 years. In the section that follows, I will explore the two most common models of performance measurement (of which impact assessment is either central to or a component of).

LOGIC MODELS

Program managers have long utilized logic models as a tool to measure program performance and effectiveness (McCawley). Logic models are graphical or narrative descriptions of linkages between program resources, activities, outputs, audiences and outcomes related to a specific program (McCawley). These linkages illustrate a sequence of cause-and-effect relationships that describe the underlying assumptions that contribute to a program's effectiveness in yielding a desired, outcome/impact or the lack thereof (McCawley). In this model, resources or "inputs" are used to implement program activities or provide services, that produce immediate products/results or "outputs" (Poister, 36). These outputs are intended to generate particular outcomes/impacts, or substantive changes, improvements or benefits that result from program implementation (Poister, 36). Using the logic model, outcomes/impacts are organized as occurring in a sequence, including short-, intermediate, and long-term outcomes (Poister, 36). The logic underlying a program design is based on a specific set of customers or participants and also allows for the inclusion of external contextual factors that may influence a program's performance from the input stage to the outcome stage (Poister, 36). After developing a logic model based on their own programs, organizations can identify and analyze relevant performance indicators tied to stated program outcomes and determine whether those outcomes (impacts) are being achieved (McCawley).

Figure 1: Logic Framework Structure



(Source: The Logic Model for Program Planning and Evaluation, University of Idaho Extension)

When applying the logic model to mission driven initiatives, resources typically include personnel (employees and volunteers), equipment, materials, physical facilities, and contract services (Poister, 38). Outputs, or work/services performed and results obtained, apply to specific cases or populations, which can be defined in a variety of ways, depending on the non-profit's mission (Poister, 38). Outcomes, categorized temporally from short to long, are measured as changes in production, behaviors, conditions, attitudes, etc. The distinction between outputs and outcomes cannot be understated. Outputs represent what a program actually does, while outcomes are the actual results it produces (Poister, 38). Outputs are typically characterized as the amount of work performed, or the volume of products or services provided, whereas outcomes are the substantive impacts that result from these outputs (Poister, 40). In the program logic model, outputs have almost no inherent value, but do lead directly to the changes or outcomes that non-profits are hoping to achieve (Poister, 38).

An advantage to logic models is that they provide transparency by explicitly stating the underlying assumptions of a program's processes and by using a simple illustration to evaluate whether the underlying assumptions are achieving the expected results. (Pefile, 662). Logic models are easy to understand for non scientific audiences and can be used to clarify program design, process flaws and tradeoffs (Pefile, 662). These models are also able to accommodate a large number of desired outcomes, without reducing the benefits into one figure (Pefile, 662). Logic models may be simple or diverse in nature and are malleable enough to encompass almost any situation program (McCawley).

One of the critiques of the logic model is that there is limited control over complex outcomes due to uncontrollable environmental variables and a customer/client behavior (McCawley). However, logic models are designed to address these issues by allowing for consideration of external contextual factors (McCawley). Another critique of logic models is that traditional models, which begin with inputs and progress to desired outcomes, can limit an organization's analysis to existing activities, programs and research questions (McCawley). In other words, beginning with inputs lends itself towards defending the status quo as opposed to creating a process for exploring new ideas or concepts (McCawley). However, this limitation can be overcome by inverting the process and delineating outcomes that an organization would like to achieve, versus those that it already achieves (McCawley).

Logic models are used in a number of fields to measure performance by 1) clarifying what resources are necessary for program implementation 2) determining the program audience 3) describing the services or products the program produces 4) and specifying what outcomes or impacts should result (Poister, 47). Logic models help organizations determine program outcomes based on internal process and system design.

Logic models are also applicable and accessible to a wide array of organizations and do not require a significant amount of expertise or resources to design and implement.

RANDOMIZATION

Logic models can be used to measure an organization's impact on the community by establishing performance measures, which can later be tracked and evaluated. However, logic models do not measure the scope of these impacts. In order to determine whether a particular program or organization is actually making an impact and the scope of that impact, organizations must be able to measure how clients/program participants would be affected, without the organization's intervention (Poverty Action Lab, PAL). There are a myriad of models used to measure impacts using comparison groups and each comes with its own set of assumptions (PAL). However, one of the most popular models, particularly in the international development field, is Randomization. Randomization is used to evaluate program effectiveness by comparing outcomes of program participants against those individuals, from the same population, that did not participate in the program. Measuring outcomes using a comparison group of non-participants is the closest achievable approximation of how individuals would have fared, but for a program's intervention (PAL).

Randomization is considered by many to be the benchmark for impact evaluation based on its ability to consistently produce the most scientifically accurate results (PAL). What makes this method unique and particularly rigorous is the random selection of two groups from the same population (PAL). Combined, these two groups represent the larger population; in other words, they are statistically equivalent to the larger group and each other (PAL). It is worth noting that randomization can include more than 2 groups, but again, each is statistically equivalent to each other and the larger group. In a simple,

randomized evaluation (with two groups), one group will receive the products and services and the other will not (PAL). By introducing an intervention to one group, we can measure the differences in outcomes to determine whether a program is achieving the desired impacts and measure the scale of those impacts (PAL). More importantly the differences in outcomes can be attributed directly to the program, because both groups started out as statistically equivalent (PAL).

Randomization has several advantages. The results of randomization are less subject to methodological debates, easier to convey and more likely to convince funders or policy makers, if presented correctly. However, this method presents challenges as well. First, randomization often requires a significant amount of resources (time, personnel, funding) and it requires very large sample groups, to be effective (Shuttelworth). This makes randomization ideal for fields such as medicine, education, psychology and the social sciences, but not necessarily for the non-profit field (Shuttleworth). Second, researchers must often select subjects, because they do not have the resources to vet larger groups. This makes it difficult to generalize the results in a way that characterizes the population as a whole (Shuttleworth). Third, designing and conducting a randomized trial and synthesizing the results, requires statistical and methodological expertise that is well out of reach of most non-profit organizations. Ultimately, randomization may represent the most scientifically rigorous and statistically accurate method of impact assessment, but perhaps not the most realistic impact assessment model for non-profit initiatives.

Assessment & Urban Agriculture

Impact assessment and performance measurement may be well established concepts, but they are a relatively new phenomenon in younger fields of research, such as urban agriculture (RUAF). Foreign NGOs devoted to international development and domestic non-profits in the fields of education and health and humans services were the first adopt assessment practices from the public sector. Currently, a number of domestic non-profits in fields such as affordable housing and microenterprise are tracking performance and impacts in an effort to justify ongoing funding efforts. As the field of urban agriculture has matured, policy makers and urban agriculture practitioners are requesting more research data and measurement and evaluation as a basis for policy decisions and project design and management (RUAF).

Monitoring and evaluation of urban agriculture is crucial in assessing the impacts and outcomes of urban agriculture projects and policy interventions (Campilan, et. al, 1). A review of available literature yields very little in terms established tools and methods for measuring and tracking impacts of urban agriculture initiatives in the United States. However, information on prevailing research methods within the urban agriculture field in an international context is available. Social, ecological, economic and biophysical research methods have been widely used in international urban agriculture to assess the impact and contribution of urban agriculture (Vasquez-Anderson, 2).

Social research methods are some of the most popular in the field (Vasquez-Anderson, 3). These methods entail the use of data collection tools such as surveys, questionnaires, participatory methods and interviews to develop case studies and assess the impact and contribution of urban agriculture projects and initiatives (Vasquez-Anderson, 2). These methods are ideally suited to explain how social groups relate to

urban agriculture activities within issues such as gender, poverty, households welfare and social class (Vasquez-Anderson, 3).

Ecological methods are used in to describe the positive and negative environmental impacts of urban agriculture on biodiversity and determine the significance of biodiversity and its contribution to food production (Vasquez-Anderson, 6). These methods have also been used to identify the benefits of growing food in urban areas, as well as to measure the dependence of agricultural initiatives on external inputs such as fossil fuels (Vasquez-Anderson, 6). Ecological research methods include measurement against standardized indices and energy analysis, which tracks energy inputs as an indicator of intensification of the production process and sustainability (Vasquez-Anderson, 6).

Environmental research methods focus primarily on how urban agriculture initiatives deal with wastewater and organic wastes via sustainability assessments (Vasquez-Anderson, 7). Methods such as chemical analysis are used to track and measure pollution and soil contamination, resulting from local food production.

Economic research methods utilized by international urban agriculture organizations include conventional methods of economic evaluation such as 1) cost-benefit analysis, 2) the hedonic technique, which measures the value of resource services that are obtained through the purchase some market good, 3) the travel cost technique, which estimates values using the travel costs that individuals incur to access a resource service, and 3) the contingent valuation method, which elicits values directly from the individuals who are potentially affected by a change in management policy (Vasquez-Anderson, 8). The relevance of economic research methods varies depending on the nature (i.e. subsistence farming versus commercial farming) and the socio economic context of the agricultural activity (Vasquez-Anderson, 7).

Lastly, biophysical research methods such mathematical modeling and GIS have been used to study a variety of issues related to urban agriculture (Vasquez-Anderson, 8). Examples of this include cluster analysis, which is used to reveal socio-economic differences between producers and customers and principal component analysis, which has used to identify periurban vegetable producers as a tool for research and technology (Vasquez-Anderson, 8). GIS is also used to develop studies on land use and has been widely used in the management of information for planning and decision making related to urban agriculture and food systems (Vasquez-Anderson, 8).

Ultimately, a variety of different models and methodologies can be used to track impacts and analyze processes, programs and performance within urban agriculture organizations. Although logic models, randomized trials and the research methods described above are potentially applicable to domestic urban agriculture initiatives, very little information is available on assessment methods applied to U.S. urban agriculture initiatives. Moreover, I was unable to find a standard index of indicators and associated outcomes within the urban agriculture field, particularly as it relates to mission driven organizations.

As part of my research, I will examine three established UA organizations and their role in revitalization of distressed communities. Specifically, I will explore how urban agriculture organizations drive revitalization in distressed urban areas and how their impacts on revitalization are measured. Given the potential economic and social benefits of UA, it is important to examine existing urban agriculture initiatives and how they are impacting broader revitalization efforts within their community. In order to do this, I evaluated three urban agriculture organizations, using primary and secondary data to develop a case study of each organization. In turn, these case studies were used to

establish a framework for tracking and measuring the impact of domestic urban agricultural activities.

CHAPTER 4: METHODOLOGY

The first step in developing a model for assessment of urban agriculture initiatives involved classification and selection of existing UA organizations. The goal of this exercise was to identify three urban agriculture organizations making a positive impact on revitalization efforts within their respective communities and use these case studies as a basis to establish a standard of impact and outcome measurement. The first step in this process involved classifying urban agriculture organizations into three distinct model types, 1) mission driven models 2) entrepreneurial models and 3) private models. Private models include private gardens or hobby beekeeping or animal keeping activities, and were excluded from consideration as case study candidates in this report.

Entrepreneurial models are defined as urban or peri-urban farms (including CSAs) involved in all manner of cultivation and production dedicated primarily to profit-driven enterprise. This is not to say that entrepreneurial organizations do not strive to serve a larger social purpose in tandem with financial objectives. However, entrepreneurial organizations are not typically mission driven, according to the definition referenced in this report. For the purposes of this report, mission driven models are defined as those that are organized to accomplish a specific goal or set of goals aimed *primarily*, at providing societal benefits to outside individuals, a group or the larger community, as opposed to profit-making for a select group of individuals within an organization. As a result, entrepreneurial models were excluded as case study candidates and only mission driven models were considered as case study candidates.

It is worth noting that community gardens fall under the mission driven model and often serve community development and food system expansion efforts and provide services to diverse and disadvantaged populations within the community. However,

community gardens often lack a formal organizational structure and do not always hold non-profit status. The implications of this are twofold: 1) it is difficult to find indicator data on individual community gardens as no incentive exists to track or publish this information as part of larger accountability or grant funding efforts 2) it is difficult to identify and contact high level stakeholders or organizers within this model for the information or data. As such, I selected only formally established entities or non-profits as case study candidates, which largely excluded community gardens.

After classification and selection of eligible case study candidates, indicator data and program outcome data was collected to develop a standard for impact measurement associated specifically with the urban agriculture field. Data from these three organizations was collected using both secondary and primary sources, including data from online sources and information from telephone interviews. Selection of case study subjects was based on a number of factors including location, track record, and the availability of primary and secondary information. Case study subjects were selected based, primarily, on the availability of secondary data and the likelihood of access to primary data in the form of interviews with high ranking stakeholders within each organization.

Primary data was collected through phone interviews with high ranking stakeholders within each organization. Secondary data was collected using online resources such as articles or reports containing quantitative and qualitative data about the organization in question. First, I performed an internet search of likely candidates to determine if there was an adequate amount of source material available to generate a profile for each candidate organization and collect impact indicators for each organization, based on secondary data. I then attempted to make contact with an individual from each organization, (from those deemed to have sufficient secondary

data), to ensure that primary data would be available through telephone or in-person interviews. Despite this measure, MAP was ultimately, non-responsive to subsequent interview requests and only secondary data was used to construct profiles, identify indicators and develop best practices.

Location also figured heavily within the selection process. My goal was to select urban agriculture organizations operating out of historically disadvantaged areas, and who were also participating in ongoing community revitalization efforts. There is a large presence of urban agriculture initiatives in the rust belt of the American northeast and Midwest. Two organizations were selected from this area, including the Massachusetts Avenue Project, based in Buffalo, New York and Growing Power, based in Milwaukee, Wisconsin. The Sustainable Food Center based out of Austin Texas, was chosen because its location is experiencing revitalization in tandem with rapid gentrification. The result is pockets of intense poverty surrounded by newly developed affluent areas, which is representative of many other major cities with strong urban agriculture movements, such as New York and Chicago. This example provides unique insight into the issues faces by urban agriculture organizations located in areas of advanced transition and sheds light on impacts and outcomes that have yet to manifest in areas like Buffalo or Milwaukee.

Organizations were selected based their track record of success. In this case, organizations deemed successful were those with 1) long track records (15 years or more) of service within their communities 2) a history of organizational growth and expansion of services to target populations, over the course of their existence, and 3) a consistent track record of receiving local, state and national recognition via awards or grant funding. Each of the organizations selected has a history of approximately 20 years or more of service within their respective communities, a track record of substantial organizational

growth and expansion of services during that time and each has local, state and national recognition in the form of awards or grant funding.

In terms of importance, identifying and determining the model for each organization was the first step in screening case study candidates - only mission driven models were considered. However, the availability of secondary data and likelihood of acquiring primary data was the defining factor in my selection process, followed by location and track record of success. Growing Power, MAP and SFC meet all of the established criteria for case study candidacy and each of these organizations is a recognized model of successful implementation within its own unique urban context. These cases provide insight into issues that surround implementation of urban agriculture initiatives in economically disadvantaged areas and serve as best practice examples for newly emerging or limited capacity UA organizations seeking to make a promote revitalization in a sustainable, equitable manner.

After selecting case study candidates, I proceeded to evaluate and classify outcome and impact indicator data. Indicator data and anecdotal information from each case study was used to establish a simple and easily adopted standard for tracking and measurement of impacts for organizations hoping to maximize the positive outcomes and mitigate the negative impacts of their activities. As part of this phase, I:

- Categorized desired outcomes from a review of available literature on positive outcomes/externalities associated with urban agriculture and linked these outcomes to goals along 4 different dimensions – economic, social, environmental and systemic
- Categorized and allocated impact data from all three case study organizations to the corresponding outcomes to create a list of impacts that could be used to broadly measure an urban agriculture organization's

contribution towards broader revitalization efforts in their respective community; and

- Created an evaluation template that linked indicator data to outcomes and then outcomes to goals along each dimension. This template is formatted for use by urban agriculture organizations, seeking to identify, track and measure organizational impacts.

Findings are presented in two parts:

Part I: A discussion of:

1. Urban agriculture as a community revitalization strategy
2. Measurement of urban agriculture's impact on revitalization efforts
3. Strategies to Maximize the Impact & Performance of Urban Agriculture Initiatives along social, economic, environmental and systemic dimensions

Part II: Conclusion

CHAPTER 5: CASE STUDIES

Case studies were developed using a combination of secondary data, collected from internet sources, and primary data collected from interviews with high level contacts at each of the case study organizations. Data collected from each organization was used to establish a simple and easily adopted standard for tracking and measurement of impacts and develop a set of best practices for organizations hoping to maximize the positive outcomes and mitigate the negative impacts of their activities. Phone interviews were conducted with Tammi Hughes, Communications & Public Relations Manager at Growing Power (GP) in Milwaukee, as well as Andrew Smiley, Deputy Director at the Sustainable Food Center (SFC) in Austin, Texas. I attempted to reach Diane Picard, MAP's Executive Director, Jesse Meeder, MAP's Farm Director, and Rebekah Williams, MAP's New Youth Training Director, but they were non-responsive. As a result, all information and data associated with MAP activities is from secondary sources.

I. Growing Power – Milwaukee, WI

URBAN CONTEXT: CITY OF MILWAUKEE

Like many other rust belt cities, Milwaukee is languishing in the wake of de-industrialization. The city has suffered a 40% decline in manufacturing jobs since the 1970s. The inexorable flow of people and jobs from Milwaukee's urban core to the suburbs of Milwaukee has left gaping holes in the city's geography. According to city agency records, there are an estimated 2,500 acres of public or privately-owned vacant land in Milwaukee (Kaufman, Bailkey). At almost four square miles, this represents 4% of the city's total land area (Kaufman, Bailkey). Those still living within the city limits

are part of a growing population of urban poor. According to the Milwaukee Journal Sentinel, the city is one of the most impoverished in the nation with a poverty rate that puts it in the nation's top 15 in cities with populations over 250,000 (Glauber, Crowe). Almost a third (29.9%) of the Milwaukee's residents lived in poverty in 2012 compared to the rest of the state at 13.2% and poverty rates have increase almost 20% since the City's golden era of manufacturing in the 1970s (Glauber, Crowe).

Milwaukee is also known as one of the most racially segregated cities in the nation, with the vast majority of African Americans living in the northern part of the city. According to U.S. Census data from 2011, approximately 45% of Milwaukee's population self reported as white and 40% as African American. However, despite almost equal representation, racial disparities in education, housing, income and employment have created enclaves of poverty in the northern region of downtown Milwaukee. This area is home to more than 90% of the city's and county's African American population. According to American Community Survey Data from 2008-2010, metro Milwaukee has one of the worst black/white household income ratios in the country. The median black household income (\$27,802) in Milwaukee is less than half that of median white household income (\$60,302) (Levine, 12). Not surprisingly, Milwaukee reported a black poverty rate of 36.5% from 2008-2010, the highest rate of black poverty among the nation's 40 largest metropolitan areas (Levine, 12). The disparity in educational attainment and employment between black and white residents of Milwaukee is profound. Almost 44% of non-Hispanic whites over the age of 25 in the region held an associate's or college degree in 2010, while less than half that number (19.4 %) of blacks reported only secondary education during the same timeframe (Levine, 15). Racial disparities in employment in Milwaukee are equally extreme - only 52% of black males between the ages of 25-54 are employed as compared to their white

counterparts (85.1%) (Levine, 16). This is due to a myriad of factors, but can be attributed largely to the shift of wealth and jobs from the inner city to Milwaukee's suburbs. Almost all net job growth within metro Milwaukee in the last few decades has occurred outside of the city proper, far from almost all of Milwaukee's African American residents (Holton). Moreover, institutional racism, poor public transportation and personal preference with regards to neighborhood and housing choices have only deepened Milwaukee's racial and socio-economic divide (Holton). It is in this environment that urban agriculture initiatives, such as Milwaukee's Growing Power, have flourished.

ORGANIZATIONAL DESCRIPTION: GROWING POWER

Overview

Growing Power (GP) is a non-profit urban agriculture organization and land trust based in Milwaukee, Wisconsin, with satellite locations in Chicago, Illinois and Madison Wisconsin. Founded in 1993 by Will Allen, GP is the last working farm located within Milwaukee's city limits. The national headquarters includes a historic 2 acre farm on the city's north side, as well as a Community Food Center. GP has 100 employees, including a full time administrative staff of approximately 25 and 12 board members. It relies on approximately 3,000 volunteers per year for its day-to-day operations.

Mission

Growing Power's mission is to provide safe, affordable and healthy foods to communities by supporting people from diverse backgrounds and the environments in which they live (GP).

Vision

“To inspire communities to build sustainable food systems that are equitable and ecologically sound; creating a just world, one food-secure community at a time” (GP).

Infrastructure

GP's urban farm currently includes:

- Six traditional greenhouses growing over 15,000 pots of herbs, salad mix, beet greens, arugula, mustards, seedlings, sunflower and radish sprouts. These greenhouses also host production of six hydroponic systems growing Tilapia, Perch, and a variety of herb and salad greens, and over 50 bins of red wiggler worms;
- Two aquaponics hoop houses with two independent fish runs and growing beds for additional salad mix and seedlings;
- Seven hoop houses growing a mixture of salad greens and mushrooms;
- A worm depository hoop house;
- An apiary with 14 beehives;
- Three poultry hoop houses with laying hens and ducks;
- Outdoor pens for livestock including goats and turkeys;
- A large plot of land on which the first stage of the organization's sophisticated composting operation is located including 30 pallet compost systems;
- An anaerobic digester to produce energy from the farm's food waste;
- A rain water catchment system; and

- A retail store to sell produce, meat, worm castings, and compost to the community.

Programs

1. **Food Production and Distribution** – Food Production and distribution includes distribution of over 400 Farm-to-City Market Baskets each week. Under this program, GP also manages the Rainbow Farmers Cooperative, a network of small family farmers using sustainable farming techniques and the Farm Fresh to Milwaukee Public Schools initiative which has already served fresh and locally grown healthy snacks to 40,000 Milwaukee Public School students. Lastly, GP heads management of Milwaukee’s Southside Walker’s Square and Mitchell St farmers markets, including 10+ farm stands throughout Milwaukee and has as presence at several other farmers markets in Milwaukee and Chicago.
2. **Youth Programs** – GP administers the Youth Corps. This program offers year-round leadership skills training in Milwaukee and Chicago. Other youth programs include service learning, and volunteer and educational opportunities.
3. **Training Programs** – GP offers a wide array of training programs including, Growing Together: Community Food Systems “From the Ground Up”, which is a monthly workshop providing hands-on training in community-based food projects. GP also hosts a Commercial Urban Agriculture Training Course. This course is a five-month workshop series designed to “grow farmers,” focusing on the business side of sustainable agriculture. A separate three month internship is also offered, in the form of an intensive, full-time training program. A year-long apprenticeship is also offered, including a full-year of intense, hands-on urban farming training. GP offers an accredited professional development training

program (with Milwaukee-based Cardinal Stritch University) for teachers seeking training in urban agriculture and a Food Systems Specialist job training program, involving 12 months of full-time job training in developing and maintaining community-based food systems.

4. **Local, National and International Community Food System Projects** – GP’s outreach program includes the Iron Street Urban Farm in Chicago. This effort is a seven acre Community Food Center based in an abandoned warehouse that will produce local, healthy and sustainable food year-round. GP also collaborates with 15 other organizations from all over the country to develop Regional Outreach Training Centers modeled off of Growing Power’s successful food production system and related programming. Lastly, GP secured a 20-year lease (the first of its kind) with Milwaukee schools to support school gardens.

Policy and Advocacy

1. **National Level** – GP serves as the fiscal agent for the Growing Food and Justice for All Initiative (GFJI) and has staff on several GFJI committees. The GFJI’s mission is to dismantle racism and empower low income communities of color through sustainable and local agriculture. The goal of the GFJI is to establish a powerful network of individuals, organizations and community based entities working together in collaboration for justice and food security. Erika Allen, Chicago and National Project’s Director, served as an appointed member of the Illinois Local and Organic Food and Farm Task Force. The task force was responsible for development of a planning document containing policy and funding recommendations for expanding the state’s local and organic food system for a report presented to the Illinois General Assembly in 2008. Erika

Allen is also co-chair of the Chicago Food Policy Council, which facilitates the development of responsible policies to improve access to culturally appropriate, nutritionally sound, affordable food grown using environmentally sustainable practices.

IMPACTS MEASURED¹

- Food products to approximately 10,000 urbanites
- 3.5 miles between Growing Power and closest grocery store
- 5 blocks between Growing Power and public housing community
- 40,000 Milwaukee public school students served Growing Power food
- No chemicals used to grow food
- 15,000 visitors per year to the Community Food Center
- \$500,000 worth of crops are produced per year
- 100 employees
- Approximately 70 farm workers paid a living wage of \$15 per hour
- 150 farm workers being hired in 2013
- 70% of heated water is provided using a solar hot water system
- 40,000 pounds of worm castings are used as natural fertilizer, produced every 4 months
- 80,000 pounds of food waste from Wal-Mart are composted weekly
- 80,000 pounds of brewery waste from Lakefront Brewery are repurposed, weekly
- 22 million pounds of food waste converted to compost, yearly
- GP uses 100% water catchment
- 25% of GPs energy is supplied through on-site solar energy systems

¹ Source: Grillo, Christine

- No fossil fuels used to grow food

II. Sustainable Food Center – Austin, TX

URBAN CONTEXT: CITY OF AUSTIN

Austin is considered by many to be a case study in economic resilience. Throughout the mortgage crisis and subsequent economic recession, Austin experienced some of the lowest unemployment rates in the nation and is currently leading economic recovery among cities nationwide, securing the first place within a ranking of the top 15 most resilient cities (Hendricks). However, despite glowing reports of economic growth, recent census data indicates that a significant percentage of Austin's residents are still struggling. City-wide, low-income and minority populations in Austin are experiencing a disproportionately large share of economic distress characterized by high rates of poverty, high unemployment and low incomes and educational attainment.

According to the City of Austin's recent Comprehensive Plan, the "Imagine Austin Comprehensive Plan" (2012), 18.5% of the city's residents lived below the poverty line in 2011, as compared to state and national rates of 17% and 14%. Additionally, 40% of Austin residents earned less than 200% of the federal poverty level in 2010 (Imagine Austin, 2012). Poverty rates among Austin's African American and Hispanic residents are particularly high at 28% and 26% respectively (2006-2010 American Community Survey (ACS)). Along similar lines, unemployment rates for Austin's African American (11.9%) and Hispanic (8.0%) populations are substantially higher than the overall unemployment rates (6.5%) (2006-2010 American Community Survey (ACS)). Educational attainment among Austin's low-income and minority residents is substantially lower than the city average, with only 21% of African Americans and 18%

of Hispanics holding a higher degree, as compared to the total population (44%) (2006-2010 ACS).

Indicators such as low incomes, high poverty and high unemployment occur among a disproportionately large share of Austin's minority residents. And like many cities, this phenomenon manifests geographically. The vast majority of Austin's underserved areas are located primarily in the Central East portion of the city, which is the historic home of Austin's low-income and minority populations. Segregation of Austin's minority population to the East Side can be traced to the "1928 Austin Plan", which formally designated the East Side as an all Black district, with services and facilities in this area dedicated solely to Black residents. The disparate results of "separate but equal" initiatives in this area continued until recently, in the form of low levels of economic investment and disproportionately high levels of poverty and crime in an ethnically diverse community. However, in the last 10 years, public and private investment in the East Side of Austin has increased exponentially, resulting in dramatic gentrification of neighborhoods once dominated by minority and low income residents. Increased property values and private development have pushed long time residents of the East Side, further and further to the periphery of the city or into the remaining affordable enclaves on the East Side. With nowhere to go and rising costs, many of Austin's poor and minority residents are simply doing more with less, particularly in terms of food and housing.

With only one grocery store serving almost the entirety of its population, vast swaths of Austin's East side are classified by the USDA as food deserts. Yet Austin is now home to anywhere from 20-40 urban farms at any given moment, with several located in City's urban core. Most of Austin's urban farms are located on its East side, which is also home to the vast majority of the city's remaining public land. It is in this

setting that organizations like Austin’s Sustainable Food Center strive to make an impact on the surrounding community by ensuring that urban agriculture initiatives are contextually sensitive and accountable to the surrounding community in a way that allows for expansion of the local food system without compromising disadvantaged communities or populations.

ORGANIZATIONAL DESCRIPTION: SUSTAINABLE FOOD CENTER

Overview

Founded in 1992, the Sustainable Food Center works towards expansion and improvement of local food systems and access to nutritious affordable food. Based out of a newly constructed headquarters on Austin’s East side, the SFC employs 17 full time administrative staff and 4 AmeriCorps staff. The SFC also retains a 20-member board, an 18-member advisory council, and approximately 3,000 volunteers per year.

Mission

Cultivate a healthy community by strengthening the local food system and improving access to nutritious, affordable food.

Vision

“SFC envisions a food-secure community where all children and adults grow, share, and prepare healthy, local food”.

Infrastructure

Sustainable Food Center Headquarters:

- More than 7,000 square feet of space
- Fully-equipped commercial kitchen
- 2.3 acre community garden adjacent to the property
- Outdoor learning pavilion, greenhouse for cultivating plant starts, composting operation, and gardening shed
- Walk-in pantry for food storage
- Outdoor deck for growing herbs in containers
- Office spaces, conference/media room, and resource library

Programs

1. **Grow Local: Spread the Harvest** – This program empowers individuals to grow their own food and share it with their community. The program provides free gardening resources, such as seeds, seedlings and compost for low-income gardeners, as well as hands-on sustainable gardening education and training taught by community based facilitators. Classes are offered on a free and fee-basis depending on need and include the only Spanish organic gardening classes in Austin. Programming also includes leadership training for implementers of community and school gardens.
2. **Farm Direct** – The Farm Direct Program includes coordination and implementation of the City’s farmers markets, market access initiatives and Farm to Cafeteria, Farm to School and Farm to Work projects. The SFC Farmers Market is the largest certified growers-only farmers market in the state of Texas, with 4 market locations. The SFC provides custom web applications to connect producers and consumers to its “Farm to” programs, as well as promotions, outreach and administrative support for all of its farm direct programs.

3. **The Happy Kitchen – La Cocina Alegre** – This program offers a six week series of Spanish led cooking classes and nutrition education classes. Classes are led by trained facilitators and located in recreation centers, faith communities, schools, and community centers. Cooking demonstrations, materials development for cooking educators, facilitator training, continuing education and fee based classes are also available under this program.
4. **Projects** – The SFC expanded to include a market on the Austin’s East Side in 2012. This new market was the first to offer a Double Dollar Incentive Program (DDIP), where fruit and vegetable purchases using WIC and SNAP benefits were matched, thereby doubling the purchasing power for low income households buying produce. First quarter sales for the new market totaled \$28,898 in 2012.

Policy and Advocacy

The SFC contributes to policy and advocacy efforts at both the local, state, and national level. Policy efforts include:

1. **School District Level** – expansion of the Farm to School program to 50 schools in conjunction with AISD facilities staff and collaboration with the School Health Advisory council to refine the process for accessing resources and setting procedures to establish gardens on school property.
2. **City and County Level** – The SFC is engaged in an ongoing process with City of Austin and Travis County staff to amend health rules related to farmers markets and is working with the Sustainable Food Policy Board to establish guidelines for local foods in public venues and to incorporate local food systems into city planning documents.

3. **State Level** – Staff at SFC play an ongoing role in research and testimony for state legislation that supports local food systems, as well as helping establish health food and food system priorities for upcoming legislative sessions.
4. **Federal Level** – The SFC worked with national policy partners in support of research for the 2012 Farm Bill and implemented community engagement initiatives and advocacy efforts with community members and local farmers in support of the bill.

IMPACTS MEASURED²

- 10,420 individuals served through Spread the Harvest
- At least 69% (7,214) of Spread the Harvest participants served were low-income
- 61 schools served by Spread the Harvest
- 8,467 garden-fresh produce meal equivalents shared by Spread the Harvest participants
- 79% of Spread the Harvest participants increased their consumption of fresh fruits and vegetables
- 15 garden education classes & 6 garden leadership trainings
- 3 Basic Organic Gardening classes in Spanish, and Spanish translation was provided through 4 additional classes
- 385 individuals attended Grow Local classes & trainings
- 830 hours of volunteer service in the community through Citizen Gardener to help others in growing their own food
- 107 school garden groups and 71 community garden groups received education, resources, or other assistance from Grow Local for their garden projects

² Figures taken from SFC's 2012 Annual Report

- 3,400 people served in the Farm to Work Program
- 32,000 children served by the Farm to School Program
- 4 community gardens received Grow Local fiscal sponsorship
- 18 schools were matched with 1 or more SFC School Garden Volunteers to assist with school gardens
- 2,167 people were served through The Happy Kitchen/La Cocina Alegre
- 23 six-week classes serving 1200 family members
- 36 healthy eating workshops serving 967 individuals
- 53% of cooking class participants come from low-income households
- 77% of cooking class participants are Latino or African-American
- 98% of cooking class participants increased their fruit and vegetable intake after taking the 6-week class
- 3,079 volunteer hours
- \$25,000 in total sales for Farm to Cafeteria
- 6 farmers involved consistently in Farm to Cafeteria
- Multiple institutions participating in Farm to Cafeteria, including six locations at University of Texas, Seton and Brackenridge Hospitals, St. Edwards University, KIPP Austin schools, Meals on Wheels and More, and Wheatsville Food Co-op
- \$174,000 in sales with over 30 worksite partners in the Farm to Work Program
- The SFC Farmers' Market is the largest certified growers-only farmers' market in the state of Texas: 120 vendors, of which 72 are farmers
- The total gross sales at the SFC Farmers' Market (all sites) - \$2.4 million
- 2% increase in sales overall from 2001-2012.
- More than 200,000 visits were made to the markets in 2012

- SNAP (Supplemental Nutrition Assistance Program) purchases at the SFC Farmers' Market increased, with \$27,014 in sales

III. Massachusetts Avenue Project (MAP) – Buffalo, NY

URBAN CONTEXT: CITY OF BUFFALO, NY

Buffalo was the picture of prosperity until the era of deindustrialization. In 1900, it was the 8th largest city in the nation and then in the 1940's, home to one of the largest steel mills in the country. However, like other manufacturing cities in the nation's rust belt, Buffalo is struggling in the aftermath of de-industrialization. As of 2010, 29.6% of city residents lived below the poverty line compared to the national average (15.3%) and 77.5% of public school children qualified for free or reduced price lunches (PPG, 1). Poverty in Buffalo is most concentrated on the east and west side, leaving only 6 census tracts in the city with a poverty rate of less than 10% (PPG, 2). In fact, 15 of the city's 79 census tracts have poverty rates of over 40%, of which four have rates over 50% and one with a 62.5% poverty rate, quadruple that of the national average (PPG, 2). Like Milwaukee, Buffalo's poverty is highly segregated and racialized, earning the title as the fifth most racially segregated large metro area in the nation (PPG, 2). Almost 40% of Milwaukee's residents are African American, but of those, 81.4% live in high poverty neighborhoods, along with 58.9% of Hispanics (PPG, 2).

In Buffalo, the single biggest cause of poverty is the prevalence of low wage jobs (PPG, 3). Middle-income manufacturing jobs have been replaced by lower paying, less secure, service industry jobs (PPG, 3). Approximately 1/3 of the local work force is employed in the service industry, earning an average median income at or below \$26,000. Buffalo's median household income is not much higher at \$30,043 and unemployment is

well above the national average at 12.4% (PPG, 2). Although low wages and unemployment are city-wide issues, the African American community has been hit hardest (GFA-PUSH, A5). More than half of Buffalo's African American men (52%) are unemployed or not in the labor force, versus 23.8% for white men (GFA-PUSH, 5). As jobs moved outward or away from Buffalo, so did the city's residents. More than 20,000 homes stand empty, resulting in a citywide vacancy rate of 17% (GFA-PUSH). In a city where 53% of resident don't even finish high school, opportunities for economic advancement are in short supply (GFA-PUSH). However, urban agriculture organizations like the Massachusetts Avenue Project are trying to address issues such as poverty, violence and food security through youth employment programs as a means of social and economic revitalization in Buffalo's lower west side.

ORGANIZATIONAL DESCRIPTION GROWING GREEN/MAP

Overview & History

The Massachusetts Avenue Project (MAP) began as a community initiative on Buffalo's lower west side in 1992, in response to neighborhood crime and violence. After incorporating in 2000, MAP implemented the Growing Green Program in 2003, to address food security, employment among the city's youth and the increasing number of vacant lots. Currently MAP employs a full-time staff of 5 and maintains a 14-member board. Its staff is housed in administrative offices and programs are held at a separate farm facility on Massachusetts Avenue.

Mission

The mission of the Massachusetts Avenue Project is to nurture the growth of a diverse and equitable local food system and promote local economic opportunities, access to affordable, nutritious food and social change education.

Vision

“MAP imagines a community in which all youth and families have access to fresh, healthy and culturally appropriate food, where people of all incomes have economic opportunities to enrich their lives and support their communities, where vacant lots are transformed into productive green spaces, growing food to supply local residents and beautify neighborhoods, where youth and their families are engaged in policy development and planning for the restoration of land and their communities”.

Infrastructure

MAP’s infrastructure consists of:

- 13 reclaimed lots on over an acre of land
- A 1,200 gallon rain water catchment system
- Floral and perennial garden beds
- 3 greenhouses,
- Urban chickens
- A vermiculture composting system
- 27,000 gallon aquaponic systems for both raise fish and plants
- 1 Mobile Market box truck
- 1 farm stand

Programs

Growing Green Program - The Growing Green program is the umbrella program for MAP's three primary urban agriculture initiatives. The Growing Green program strives to integrate youth development with urban agriculture to improve the community while providing increased access to affordable healthy food. Growing Green employs roughly 50 youth per year across its three sub programs. Growing Green's programs maintain a waiting list each year and represent a diverse group of youth, primarily from Buffalo's West Side. The average age of Growing Green program participants is sixteen.

Farm Education - Hands-on agriculture training and education is provided at MAP's one acre farm site through its farm education program. Youth are employed in every facet of cultivation and production, including composting, aquaponics, animal husbandry, planting, harvesting, plant care and farm planning.

Growing Green Youth Enterprise – The Youth Enterprise program manages Growing Green Works, a locally owned and operated venture that is run by urban youth in the Growing Green Program. The GGW venture was implemented in 2006 and serves as an enterprise education program that provides hands-on business experience and leadership training. In this program, youth learn how to create linkages to the local economy using urban agriculture and expand their local food system by developing and marketing organic value added products such as salad dressing, chili starter and salsas made from ingredients taken from the MAP farm site. Products are available at 25 retail

sites throughout the city. Program participants learn aspects of business management, planning, marketing, sales, and accounting.

Mobile Market –

Growing Green’s Mobile Market Program works to provide access to organic, locally grown produce in low income neighborhoods with limited access to farmers markets and grocery stores through the use of a mobile market and delivery vehicle. The mobile market accepts EBT and SNAP benefits at six sites throughout the city to ensure access to affordable produce.

Youth Outreach and Policy – As part of this program, youth work with MAP staff on education and marketing materials and research on food security and access issues. As part of outreach activities, youth are encouraged to engage creatively and develop social media skills. As part of its policy initiatives, Growing Green youth sit on the steering committee for the Healthy Kids, Healthy Communities Coalition and the city-wide Youth Advisory Council and work on issues related to healthy food access at schools and transportation options for disadvantaged youth. Student leaders have also participated in land use and zoning processes associated with the City of Buffalo’s Green Code Community Planning meetings.

IMPACTS MEASURED³

- 1,244 individuals provided access to otherwise inaccessible organic produce through the mobile market program

³ Figures are from 2011

- 100% graduation rate of Growing Green seniors (in contrast to the city-wide average of 47%)
- 2,800 people receiving training, education, or farm tours
- 278 school children worked or visited the farm
- 300 community member volunteers
- 50 (approx.) jobs per year created for low income youth
- 9 restaurants buying MAP produce
- 6,000 lbs of organic food grown
- 25,000 Tilapia in the new aquaponics system
- 3/4th of an acre of land in organic production
- 1 recirculating fish farm system
- 350,000 lbs of food removed from the municipal waste system through composting
- 2,634,000 gallons of rainwater collected and diverted from wastewater system for irrigation

CHAPTER 6: CLASSIFICATION & MEASUREMENT

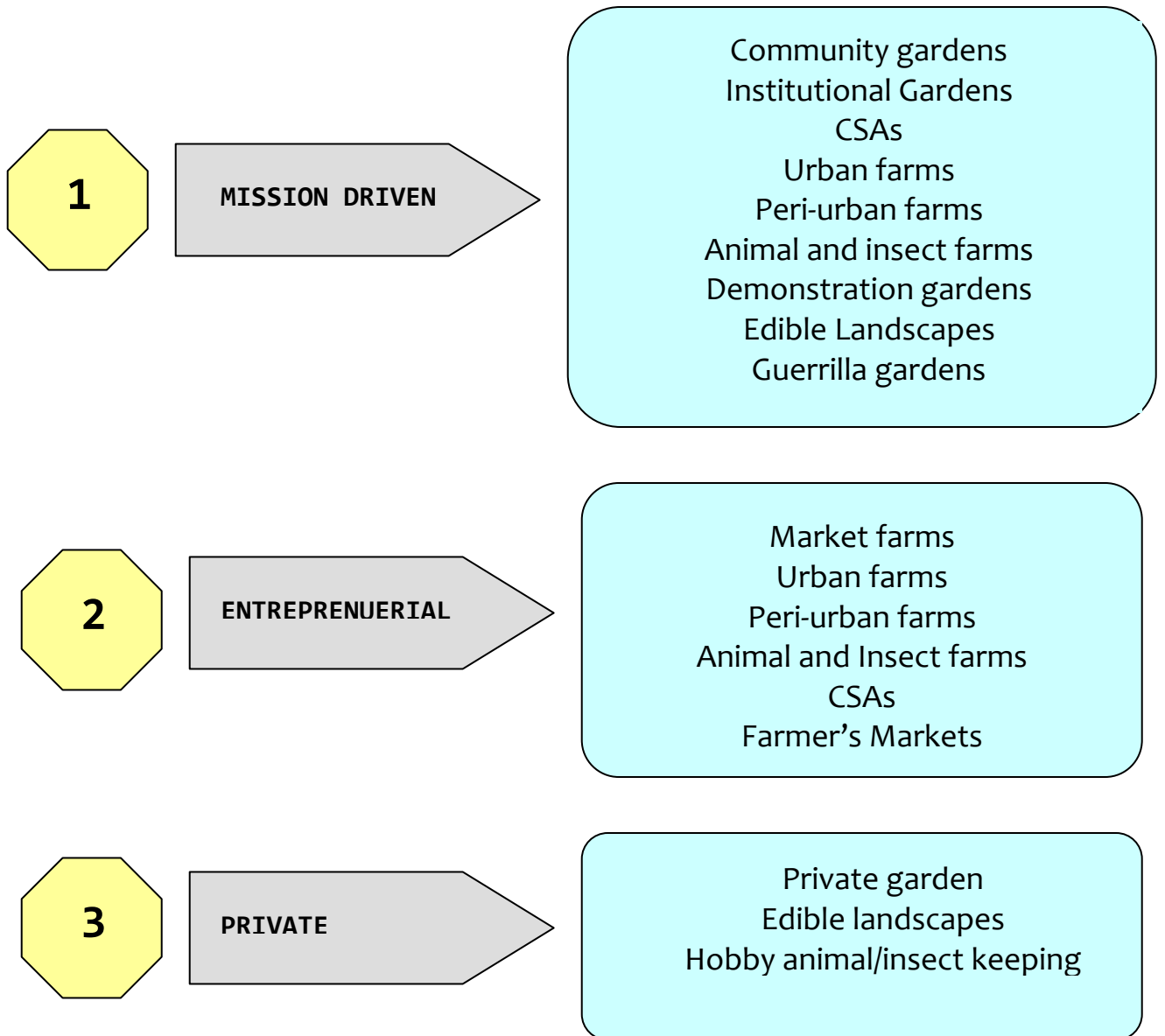
As part of my research into how urban agriculture organizations drive economic and social revitalization efforts and how their impacts are measured, I evaluated three distinct urban agriculture non-profits operating in economically disadvantaged areas. Each organization described in the case studies above represents a mission driven urban agriculture initiative. My goal is to identify and catalog outcomes and indicators associated with these organizations along four (economic, social, environmental and systemic). I will use indicator data and anecdotal information from each organization's profile to establish a simple and easily adopted standard for tracking and measurement of impacts and develop a set of strategies for organizations hoping to maximize the positive outcomes and mitigate the negative impacts of their activities on community revitalization efforts.

Categories of Urban Agriculture Initiatives

For the purposes of this report, urban agriculture initiatives were placed into three (3) main categories, based on model types: 1) mission driven models 2) entrepreneurial models and 3) private models. For the purposes of this study, mission driven models are defined as those that are organized to accomplish a specific goal or set of goals aimed *primarily*, at providing societal benefits to outside individuals, a group or the larger community, as opposed to prioritizing profit-making for a select group of individuals within the organization. Private models are defined as private gardens or hobby beekeeping or animal keeping activities. Entrepreneurial models are defined as urban or peri-urban farms (including CSAs) involved in all manner of cultivation and production

and which are dedicated primarily to profit-driven enterprise. Although many entrepreneurial organizations also strive to serve a larger social purpose or meet triple bottom line objectives in tandem with financial objectives, they are not mission driven as defined in this report. Unlike mission driven organizations such as non-profits, entrepreneurial initiatives are not held accountable to the community at large; or at least not in a way that extends beyond meeting financial objectives. The assessment model proposed herein was developed with mission driven organizations in mind. That being said, it remains applicable to a wide range of urban agriculture organizations seeking to enhance their ability to make a positive impact on their community and further revitalization efforts. The three categories and associated uses are illustrated below:

Illustration 1: Categories of Urban Agriculture initiatives



Urban Agriculture: Defining Outcomes

In order to evaluate how urban agriculture contributes to economic and social revitalization in urban areas, it is essential to understand both the positive and negative implications of agriculture in an urban context. Describing the potential outcomes will help establish a set of goals for measurement of urban agriculture activities as they relate to overall revitalization efforts.

POSITIVE OUTCOMES

A review of recent literature reveals a wide array of potential positive outcomes associated with urban agriculture. Urban agriculture provides many benefits to a variety of stakeholders, including neighborhood residents, city residents, local organizations and establishments and local government. It serves as an alternative development option for reuse of vacant tracts of underutilized land in economically depressed areas. Vacant land and structures often serve as a locus for illegal activity, including drug use, trespassing, vandalism, littering, arson and illegal dumping, which negatively impact the community and create a drain on local government resources (Mogk). Transforming these blighted and unstable areas into productive green space can mitigate crime and reduce municipal spending by eliminating the need for the city to police or maintain the property (Mogk).

Creating local food sources by using vacant land helps low income communities gain access to fresh, nutritious food options, while building social capital and a source of income (Lehrer). Additionally, urban agriculture provides a variety of social benefits when it serves as a vehicle for youth and adult education, training, and community development through school programming and work programs (Mogk). Urban agriculture in its many forms (community gardens, community supported agriculture, farmers markets, institutional programs, etc.) can be a catalyst for community

engagement, community building, and the construction of social networks and support systems (Hodgson, et. al., 20). It can also provide opportunities for interaction between varieties of stakeholders from diverse backgrounds and fosters an environment of comfort, friendship and trust that is vital to collective investment in the community (Hodgson, et. al., 20). Successful urban agriculture initiatives can also serve as a source of tourism and attract public and private investment to economically depressed or neglected areas, which can improve the lives of current residents and attract other residents to the area (Mogk).

In terms of health benefits, urban agriculture can provide direct access to nutritious, whole foods, for low income individuals or individuals living in low income areas (Hodgson, et. al., 20). Urban agriculture initiatives can also improve health outcomes by providing access to education surrounding nutrition, diet and healthy eating behaviors and by teaching youth and adults how to grow, harvest, prepare and cook locally grown produce. (Hodgson, et. al., 20). Urban agriculture is even being used as a means of therapeutic treatment for recovering drug addicts, alcoholics, and for job training and employment for former convicts and the homeless (Hodgson, et. al., 20).

The environmental benefits of urban agriculture are significant. From an environmental management perspective, urban agriculture contributes to decreased storm water runoff, reduced soil toxicity, and decreases in other forms of pollution while maximizing the production capacity of underutilized land. Indirectly, it creates urban ecosystems that serve as homes to urban wildlife and beneficial insects, thereby increasing urban biodiversity. Increases in urban food production also decrease our reliance on commercial monoculture, thereby minimizing the impacts of food production on the planet (Peters, 220). Transitioning to urban agriculture could also reduce the consumption of undeveloped land for farming and conserve open space for natural habitat

by producing food in already developed and populated areas (Peters, 220). Urban food production can reduce the effects of climate change by decreasing greenhouse gas emissions through the use of minimal mechanization and organic fertilizers, by reducing transportation, refrigeration and storage costs, as well as, creating a closed loop system for recycling of food waste and food byproducts (Lehrer, Peters, 220). Wastewater, compost and castings generated by urban agriculture can be repurposed as fertilizer, which serves as both an additional source of revenue and a means of recycling waste. Purchasing produce from community gardens or farmers markets within a 100 mile radius also helps reduce automobile emissions and waste products from food packaging (Lehrer).

Providing land and support infrastructure for urban residents to produce and sell food promotes economic growth by allowing urban residents to supplement their incomes. Expanding the food system to include SNAP benefit recipients helps low income households obtain fresh fruits and vegetables directly from community food-bank gardens where they contribute labor and ultimately reduces government food stamp benefit payouts. Such a system gives low-income residents additional benefits including access to more nutritious food, acquisition of farming skills and practices, increased social connectedness, and pride in “ownership. Growing food locally keeps more dollars circulating within communities, as opposed to purchasing food from national supermarket chains, which diverts money away from the local economy (Kumar). Dollars spent buying products from a local farmer or business can then be spent by the farmer or local business owner on other locally produced goods, creating localized wealth within a community (Kumar). This effect, known as the multiplier effect creates a system in which money spent at locally owned businesses stimulates additional economic transactions, which results in local wealth creation and retention (Kumar). Urban

agriculture also creates local employment opportunities. Additional jobs or increased income for local residents translates to more spending within the community (Kumar). Urban agriculture fosters the growth and development of marketable trades and crafts, such as carpentry, irrigation, electric work, construction, plumbing, canning, pickling, cooking, animal husbandry, and beekeeping, which are profitable and add value to the local economy. In addition to benefitting the environment, waste streams generated from urban agriculture production can create new economic value through recycling, repurposing or resale (Kumar). An example of this would be the use of urban food waste as compost for urban agriculture initiatives or the sale of worm castings or compost generated from urban agriculture to individuals or businesses within the community (Kumar). Lastly, the aesthetic, social, and economic improvements generated by repurposing green space in economically depressed areas has the potential to increase property values in distressed communities, which can increase the tax base and generate much needed revenue for local governments.

NEGATIVE OUTCOMES

Despite the vast potential of urban agriculture to promote economic growth, foster social equity, improve health outcomes and mitigate the environmental impact of food production, there are negative consequences to urban agriculture. One of the potential pitfalls of agriculture in an urban context is incompatibility with surrounding uses, resulting in public health hazards or environmental nuisances. Poorly chosen sites and poorly monitored and operated urban agriculture initiatives, including composting and animal husbandry operations, can result in extreme noise or odor (Hodgson, et. al., 22). Use of chemical fertilizers, pesticides, and poor cultivating or animal keeping practices can lead to the same environmental issues that plague commercial agriculture, including

soil and water toxicity. Conversely, industrial waste and pollutants embedded within the soil of urban farming sites can present a public health threat and cause serious health issues for consumers who acquire products cultivated on contaminated sites (Hodgson, et. al., 22). In terms of economic and social equity, entrepreneurial urban agriculture initiatives located on parcels in economically distressed areas can exploit low income residents by using them as cheap labor without offering products that are financially inaccessible to them or the surrounding community. Entrepreneurial UA initiatives situated in low income areas, that do not contribute jobs, social services, or products to neighborhood residents, only magnify the existing inequities created by the larger food system continuum. In cases such as these, urban agriculture can actually serve to weaken the social fabric of a community and create tensions among community stakeholders. Even in the best case scenario, where a grassroots urban agriculture initiative provides both social and economic returns to the community, the resulting increase in public and private development and attention can result in increased property values and gentrification, negatively impacting communities, particularly those of color with generations-old, historical ties to the area.

Despite the possible negative effects of urban agriculture at its worst, I believe the potential benefits outweigh the risks. As the newest incarnation of urban agriculture unfolds, it is important to look at initiatives currently serving their communities in an equitable and sustainable manner. Moreover, it is important to analyze these initiatives in relation to desired outcomes to establish a means of measurement for their roles in larger revitalization efforts. In the section that follows, I will distill the outcomes discussed according to the four predetermined dimensions: economic, social, environmental and systemic.

DISTILLED OUTCOMES

A review of the prevailing literature on urban agriculture activities revealed an extensive list of positive and negative outcomes associated with urban agriculture. An evaluation of online secondary data and primary data from interviews with Growing Power and The Sustainable Food Center contributed additional outcome data. Outcome data has been consolidated and categorized across four primary dimensions 1) Social, 2) Economic, 3) Environmental and 4) Systemic. Each dimension is representative of four overarching goals, which are linked directly to corresponding outcomes.

Table 1: Outcomes Across Dimensions

DIMENSION	GOAL	OUTCOMES
Social	Build Social Capital & Ensure Social Equity	<ul style="list-style-type: none"> • Provide access to affordable, nutritious, and organic food and increase opportunities for access to affordable, locally grown food for low-income populations via benefits programs or expanded distribution efforts • Provide health and nutrition literacy • Improve health outcomes by providing increased access to youth, adults and disenfranchised populations with food system, urban agriculture and nutrition based education • Improve employment outcomes for at-risk youth and adults and low-income adults through job training • Reuse of vacant or blighted land to improve aesthetics and neighborhood safety • Promote community development/engagement & increase stakeholder participation and representation in community development efforts
Economic	Create Equitable Economic Opportunity	<ul style="list-style-type: none"> • Keep dollars inside the local economy • Create industry • Create jobs • Provide a living wage • Attract outside investment • Attract tourism • Increased tax revenue
Environmental	Promote Environmental Sustainability & Equity	<ul style="list-style-type: none"> • Recycle and/or repurpose by-products and waste streams • Create Green space • Mitigate the environmental impacts of agriculture • Stormwater absorption (low amount of impervious surfaces)
Systemic	Build & Expand Local Food Systems	<ul style="list-style-type: none"> • Create linkages between key stakeholder in local food system and between the local and larger food system • Increase production capacity • Affect positive changes in food systems and urban agriculture policies

DISTILLED OUTCOMES & ASSOCIATED IMPACTS

Each of the outcomes listed above is tied to one or more set of measurable impact indicators. Indicator data was compiled from available secondary data and from interviews with Growing Power and The Sustainable Food Center. This indicator data was then allocated corresponding outcomes. A table of outcomes tied to relevant indicators can be seen below:

Table 2: Impact Measures Across Dimensions and Outcomes

SOCIAL	
Outcome	Impact Indicator
Provide access to affordable, nutritious, and organic food and increase opportunities for access to affordable, locally grown food for low-income populations via benefits programs or expanded distribution efforts Provide health and nutrition literacy	<ul style="list-style-type: none"> • Lbs of locally grown food and produce to city/community residents • \$ worth of locally grown food and produce to city/community residents • Lbs of <i>organic</i> locally grown food and produce to city/community residents • \$ worth of <i>organic</i> locally grown food and produce to city/community residents • Lbs of locally grown food and produce to low income individuals • \$ worth of locally grown food and produce to low income individuals • Lbs of <i>organic</i> locally grown food and produce to low income individuals • \$ worth of <i>organic</i> locally grown food and produce to low income individuals • \$ worth of SNAP benefits used to purchase food and produce • Number of market or distribution sites • Number of market or distribution sites in low income census tracts • Number of farmers and vendors at markets (managed by subject organization) • Number of visitors at markets (managed by subject organization)

Table 2 (continued)

<p>Improve health outcomes by providing increased access to youth, adults and disenfranchised populations with food system, urban agriculture and nutrition based education</p>	<ul style="list-style-type: none"> • Number of adults receiving food system and nutrition education • Number of hours of food system and nutrition education provided to adults • Number of youth (18 years of age or under) receiving food system and nutrition education • Number of hours of food system and nutrition education provided to youth (18 years of age or under) • Number of adults from disenfranchised populations (addicts, convicts, homeless) receiving food system and nutrition education • Number of hours of food system and nutrition education provided to adults from disenfranchised populations (addicts, convicts, homeless) • Data on reported behavioral changes after education
<p>Improve employment outcomes for at-risk youth and adults and low-income adults through job training</p>	<ul style="list-style-type: none"> • Number of at-risk youth (18 years of age or under) receiving food system and urban agriculture job training • Number of hours of food system and urban agriculture job training provided to at-risk youth (18 years of age or under) • Number of low-income adults receiving food system and urban agriculture job training • Number of hours of food system and urban agriculture job training provided to low-income adults • Number of adults from disenfranchised populations (addicts, convicts, homeless) receiving food system and urban agriculture job training • Number of hours of food system and urban agriculture job training provided to adults from disenfranchised populations (addicts, convicts, homeless) • Graduation rate of program participants as compared to overall class graduation rate • Number of businesses started up/incubated
<p>Reuse of vacant or blighted land to improve aesthetics and neighborhood safety</p>	<p>Number of parcels either under cultivation or being utilized for urban agriculture activities</p> <p>Number of acres either under cultivation or being utilized for urban agriculture activities</p>

Table 2 (continued)

<p>Promote community development/engagement & increase stakeholder participation and representation in community development efforts</p>	<ul style="list-style-type: none"> • Number of volunteers recruited per year • Number of volunteer hours per year • %age of board that are members of an ethnic/racial minority • %age of staff that are members of an ethnic/racial minority • %age of board that are members of the local community • Number of community/institutional gardens sponsored per year • Number of community/institutional gardens sponsored per year in low income census tracts • Number of community engagement/outreach initiatives sponsored or administered • Number of participants at community engagement/outreach initiatives • Type and number of potential stakeholders identified for each community engagement outreach initiatives • Number and type of actual participating stakeholders at community engagement/outreach initiatives
ECONOMIC	
Outcome	Impact Indicator
<p>Keep dollars within the local economy</p>	<ul style="list-style-type: none"> • Total value of products sold to local consumers/retailers/restaurants/institutions (by program, if applicable) • Locally sourced inputs
<p>Create industry</p>	<ul style="list-style-type: none"> • Type of cottage industries created • Number of cottage industry entities created • Revenue (\$) generated from cottage industry entities
<p>Create jobs</p>	<ul style="list-style-type: none"> • Number of overall jobs created • Number of jobs created and filled by neighborhood residents
<p>Provide a living wage</p>	<ul style="list-style-type: none"> • Hourly rate (\$) • Hourly rate as a %age of the area wide living wage

Table 2 (continued)

Attract outside investment	<ul style="list-style-type: none"> • Public investment: source (local/state/federal) • Public investment: type (funding/infrastructure/land/technical assistance) • Public investment: \$ value • Private investment: source (corporate/foundation) • Private investment: type (funding/infrastructure/land/technical assistance) • Private investment: \$ value
Attract tourism	<ul style="list-style-type: none"> • Number of tourists to facilities
Increased tax revenue for local governments	<ul style="list-style-type: none"> • Increases in property values of parcels surrounding facilities
ENVIRONMENTAL	
Outcome	Impact Indicator
Recycle and/or repurpose by-products and waste streams	<ul style="list-style-type: none"> • Lbs of castings generated • Lbs of fertilizer generated • \$ value of castings sold • \$ value of fertilizer sold • Lbs of compost created (external sources) • Lbs of compost created (internal sources) • \$ value of compost sold • Gallons of storm water caught and used for operations • Gallons of wastewater recycled
Create green space	<ul style="list-style-type: none"> • Acres of land used for urban agriculture activities • Acres of land used for organic production • Number of community gardens created • Total acreage of community gardens • Number of community gardens created in low income census tracts • Total acreage of community gardens in low income census tracts
Mitigate the environmental impacts of agriculture	<ul style="list-style-type: none"> • % of operations run using solar energy • % of operations heated by composting activities • % of fossil fuels used during agriculture activities • % of fertilizers used: organic • % of pesticides used: organic • % of activities mechanized • % of sites under cultivation, that were former Brown fields • reduction of VMT for food distribution

Table 2 (continued)

SYSTEMIC	
Outcome	Impact Indicator
Create linkages between key stakeholders in local food system and between the local and larger food system	<ul style="list-style-type: none"> • Number of products sold directly to individual consumer • Total value of products sold directly to individual consumer • Total value of products sold directly to retailers • Total value of products sold directly to restaurants • Total value of products sold directly to institutions • Total value of products sold directly to distributors/manufacturers • Number of partnerships with local school districts • Number of partnerships with universities and other institutions (farm to work programs) • Number of partnerships with local entrepreneurial urban farms • Number of partnerships with commercial food providers
Increase production capacity	<ul style="list-style-type: none"> • Facilities (sq.ft.) or land (acres) added for urban agriculture activities • Facilities (sq.ft.) or land (acres) added for urban agriculture activities in low income census tracts • Number of new programs added • Number of additional people served by new programs • Number of additional low income individuals served by new programs
Affect positive changes in food systems and urban agriculture policies	<ul style="list-style-type: none"> • Number of local level policy initiatives participated in: • Number of state level policy initiatives participated in: • Number of federal level policy initiatives participated in:

Ideally, the outcomes and indicators included in this model could apply to most, if not all, urban agriculture organizations, including both mission driven and entrepreneurial models. However, the applicability of outcomes and indicators to each organization may vary according to organization type, size, location, mission and other contextual factors. The purpose of delineating outcome data in this manner is to establish a series of measures that represent an organization's ability to meet specific mission-driven goals. The purpose of associating each outcome with a set of impact indicators is to provide a

framework for collection, tracking and analysis of urban agriculture activities. Collection, tracking and analysis of activities helps organizations 1) evaluate program performance by tracking impacts as they relate to successful fulfillment of outcomes and goals 2) identify gaps in provision of products and services 3) ensure accountability to clients and the community at large, and 4) track expansion and capacity building efforts. Being able to track and measure impacts is particularly important for mission driven organizations operating out of areas with significant low income and minority populations. These areas, as evidenced in the case studies for GP and MAP in particular, are already operating at a significant economic, social and cultural disadvantage. Ensuring that mission driven organizations are achieving maximum outcomes across multiple indicators is crucial to promoting sustainable and equitable revitalization efforts in these areas.

Evaluation Template

A review of available literature yielded relatively few methods of assessment for domestic urban agriculture activities/impacts and no consolidated list of impact indicators associated with mission driven urban agriculture initiatives. The model outlined above is intended to help mission driven urban agriculture organizations define organizational/programmatic goals and track impacts across outcomes and programs to evaluate their own role in community revitalization efforts. A consolidated template for assessment for use by urban agriculture initiatives can be found in Appendix A of this report.

CHAPTER 7: FINDINGS

Discussion

URBAN AGRICULTURE AS A COMMUNITY REVITALIZATION STRATEGY

Urban agricultural uses such as farms, community gardens, residential gardens and farmer's markets have always existed; albeit to a lesser degree, as the U.S. commercial food system replaced local food systems in the mid 20th century. Despite the diminished scope of modern urban agriculture, it can play a crucial role in revitalization of low income communities. Urban agriculture can help communities build social capital, foster capacity building and community empowerment through the use of both community gardens and educational activities associated with food production. This is particularly important in low-income neighborhoods where urban agriculture initiatives, in combination with other efforts to provide access to healthy affordable food, can most effectively address and improve food security. It can also provide enormous economic benefits by serving as a catalyst for workforce development for neighborhood residents, skills development for at-risk youth, and generate multiple forms of revenue via the end products and capitalization of waste streams derived from the production process.

Recognizing the many positive impacts of urban agriculture on economically distressed areas, communities and municipalities across the U.S. initiated a wave of urban agriculture initiatives in the 1960s, in the form of community gardens. Even today, community gardens remain the primary urban agricultural use for community development and revitalization efforts in U.S. cities. One such example is NeighborSpace (NS) in Chicago, Illinois. NeighborSpace is a non-profit urban land trust that works to preserve community based gardens in Chicago. NeighborSpace was established as a non-profit in 1996 by the City of Chicago, in cooperation with the

Chicago Park District and the Forest Preserve District of Cook County, with a mission to acquire existing community gardens and ensure their continued survival (NS). These founding agencies continue to provide leadership and financial support to NeighborSpace (NS). NeighborSpace owns the real property on which each urban garden is situated and provides stewardship, support, technical assistance and essentials such as basic insurance and access to water (NS). Ownership by the trust helps protect these gardens from development and preserves these spaces for use by each neighborhood (NS). NeighborSpace views these sites as means of improving quality of life in Chicago's neighborhoods and believes that they represent "important community assets that provide residents with opportunities to socialize with each other, plant and grow food, or simply be outside and enjoy nature" (NS). NeighborSpace currently stewards 81 community garden sites across 31 wards within the City of Chicago (NS).

Another example of neighborhood revitalization through community-led urban gardens is Nuestras Raices, in Holyoke, Massachusetts (NR). Founded in 1992 by a group of individuals from Holyoke's immigrant Puerto Rican community, Nuestras Raices is a grass roots non-profit dedicated to promoting "human, economic, and community development in Holyoke, Massachusetts, through projects relating to food, agriculture and the environment" (NR). According to Nuestras Raices, its founding members were all migrating farmers from Puerto Rico who "found themselves in a city without opportunity" (NR). In attempt to create opportunity for themselves and revitalize the built space within their community, the founders identified a blighted lot in Holyoke and established the first of 10 community gardens. NR's gardens now have over 100 member families. NR also manages a 30-acre inner city farm and runs environmental justice and youth programs that address issues affecting the Holyoke community.

In terms of urban agriculture, community garden initiatives are widely held to be on the front lines of neighborhood development and revitalization efforts. However, alternative uses such as urban farms, CSAs, farmer's markets and food systems/resource organizations are beginning to play a larger role in community revitalization efforts. These alternative uses have several advantages over community gardens in terms of driving revitalization along economic, social and systemic dimensions. First, these uses serve as vehicles for programs that provide nutrition education, cooking classes, and youth education. Community gardens often do not have the physical infrastructure or the financial resources to provide these services. Second, alternative uses such as urban farms provide opportunities for economic development in the form of employment, job training, cottage industry, and outside investment. Third, urban farm and food system/resource organizations have the necessary staff and resources to create linkages between key stakeholders in local food systems and between local systems and the larger food system and to affect positive changes in food systems and urban agriculture policy. Although less in number, mission driven urban farms and food system/resource organizations such as Growing Power, in Milwaukee, Wisconsin, The Food Project in Boston, Massachusetts, The Greening of Detroit, in Detroit, Michigan, the Massachusetts Avenue Project in Buffalo, New York, the Sustainable Food Center in Austin, Texas and the Ohio City Fresh Food Collaborative in Cleveland, Ohio, to name a few, all represent targeted efforts at revitalization through alternative uses.

MEASURING URBAN AGRICULTURE'S IMPACT ON REVITALIZATION EFFORTS

Mission driven non-profits like Growing Power (GP) and the Sustainable Food Center (SFC) both self reported as playing an important role in driving revitalization efforts within their respective communities. Additionally, both organizations have

integrated key aspects of community development and revitalization, either explicitly or indirectly, in their mission statements and vision statements. Although we were unable to make contact with staff at the Massachusetts Avenue Project (MAP), their vision statement describes a clear picture of their intent to revitalize communities by providing access to healthy and culturally appropriate food, opportunities for people of all incomes to support their communities, transforming vacant lots into productive green spaces and helping to beautify and restore land to youth and the community at large (MAP). In their annual report, MAP also acknowledges that food system development is beginning to be recognized as a critical part of successful community development.

Despite playing an active role in revitalization efforts along each of the four dimensions, neither SFC nor GP uses a common methodology for tracking and measurement of impacts or outcomes as they relate to mission goals. Additionally, both have different ways of defining and targeting low income or disadvantaged populations. Tammi Hughes, Communications & Public Relations Manager at Growing Power acknowledged that she is not aware of any systematic or consistent efforts at tracking or assessing GP's impacts. Also, unlike the SFC and MAP, GP does not publish an annual report. Indicator data was available mainly through secondary sources such as online interviews with GP's founder, Will Allen. Given its successful track record in securing grant funding, it is difficult to believe that GP does not keep metrics or track impacts, at the very least for development purposes. Also, GP consciously targets low income populations for intervention, but Ms. Hughes was unable to provide information regarding exactly how sites and populations are selected. Given the concentrations of poverty along racial lines and the extreme level of geographical segregation in Milwaukee, identifying underserved or low income populations should not be difficult. However, for future funding efforts, it behooves non-profits like GP to define service

areas and target populations along generally accepted standard such as low income or high poverty census tracts.

Andrew Smiley, Deputy Director at the Sustainable Food Center (SFC), noted that the SFC stills maintains some measures in place to track individual behavior, knowledge, and attitude changes, such as increased consumption of fruit and vegetables, increased participation in farmers markets, or increased knowledge about food. However, the SFC has shifted its focus to identification and creation of opportunities for individuals to participate as producers, decision makers, and marketers in local food systems. Very little opportunity exists for these kinds of interventions in the commercial food system. In contrast, local community-based food systems provide opportunities for individuals to participate as producers, decision makers and marketers through school gardens, home gardens, and small scale family farms. The SFC is also attempting to track changes in the food system. One example of this is tracking consumer decision making based on shifting values towards environmental and cultural preservation and health. SFC tracks changes using its member database to follow the progress of individual participation in its programs as they progress from one class to another and also by tracking increases or decrease attendance at farmer's markets.

Unlike GP, the SFC uses a recognized standard to define its target populations. Generally, the SFC serves lower income communities in central Texas. However, over the course of its operations, it began targeting underserved populations by identifying schools with high percentages of children receiving free and reduced lunches. Approximately 8 years ago, the SFC began creating connections with specific communities using schools as a hub for interaction through its Sprouting Healthy Kids School Program. It was through this school-based program that the SFC recognized an opportunity to connect specifically with low income families - those with children

receiving free and reduced lunch rates (defined as 130% of the federal poverty level and 185% of federal poverty level respectively). Currently, between 92% and 97% of the students at SFC's 25 partner schools qualify for reduced lunches. The standard used by SFC may be more common or easier to define than that of GP, but ultimately a governing standard for defining low-income populations and census tracts will be developed and it behooves urban agriculture non-profits to look ahead and plan for future impact measurement needs.

Conclusion

URBAN AGRICULTURE AS A DRIVER OF COMMUNITY REVITALIZATION

Urban agriculture initiatives drive revitalization in economically distressed communities in a number of ways. UA initiatives further social revitalization efforts by ensuring access to affordable, nutritious food and increasing opportunities for access to food by low-income populations. They also improve health outcomes for youth, adults and disenfranchised populations through food system, urban agriculture and nutrition based education programs. UA initiatives contribute to improved employment outcomes for at-risk youth and adults and low-income adults through job training. They also promote reuse of vacant or blighted land to enhance aesthetics, promote neighborhood safety and encourage community and stakeholder participation. UA initiatives foster economic revitalization efforts by keeping dollars inside the local economy, creating industry and jobs, providing a living wage, attracting outside investment and tourism and generating additional tax revenue. UA initiatives contribute to revitalization efforts through environmentally conscious practices, such as recycling and reuse of byproducts and waste streams, creation of green space, and mitigation of negative impacts on the environment using renewable energy and chemical free, organic cultivation practices.

Urban agriculture organizations contribute to local food system expansion by creating linkages between key stakeholders in local food systems and between local systems and the larger food system. They also have the capacity to affect positive change in food systems and urban agriculture policy using outreach and advocacy. In terms of scope and implementation, community gardens are the most widely used vehicle for revitalization initiatives utilizing urban agriculture models. However, alternative uses such as urban farms, CSAs, farmer's markets and food systems/resource organizations are beginning to play a larger role in community revitalization efforts. Moreover, they offer several advantages over community gardens in terms of driving revitalization along economic, social and systemic dimensions and have the potential to make a significant positive impact low income communities.

MEASURING THE IMPACTS OF URBAN AGRICULTURE ON REVITALIZATION

Based on a review of available sources, it appears as if impact assessment is not yet a common practice among UA organizations in the United States. However, as the field of urban agriculture has matured, policy makers and urban agriculture practitioners are requesting additional research data and methods for measurement and evaluation as a basis for policy decisions and program design and management. Interviews with case study subjects suggest that, what tracking and assessment does occur is not standardized. Additionally, they indicate that urban agriculture organizations do not utilize a governing methodology to define their targeted low income populations or geographies.

Given the lack of anecdotal and published information on assessment of domestic urban agriculture initiatives, there appears to be a need for improved methods of impact and outcome assessment and identification of targeted low-income groups. Assessment and measurement is particularly relevant to mission driven urban agriculture

organizations. Impact assessment and measurement can help mission driven urban agriculture non-profits justify grant funding and ensure accountability as stewards of public subsidies. The assessment method proposed in this report is intended to help mission driven urban agriculture organizations meet this need by helping them define organizational/programmatic goals and track impacts across outcomes and programs to evaluate their own role in community revitalization efforts.

Strategies to Maximize the Impact & Performance of Urban Agriculture Initiatives

The section below provides a select sample of strategies utilized by Growing Power, the Massachusetts Avenue Project and the Sustainable Food Center to maximize the positive impacts of their activities on their respective communities. Phone interviews were conducted with Tammi Hughes, Communications & Public Relations Manager at Growing Power (GP) in Milwaukee, as well as Andrew Smiley, Deputy Director at the Sustainable Food Center (SFC) in Austin, Texas. I attempted to reach Diane Picard, MAP's Executive Director, Jesse Meeder, MAP's Farm Director, and Rebekah Williams, MAP's New Youth Training Director, but they were non-responsive. As a result, all information and data associated with MAP activities is from secondary sources. All information provided about GP and SFC activities below was taken from phone interviews with Diane Picard and Andrew Smiley, unless otherwise cited.

SOCIAL
1. Identify and target existing infrastructure to scale production in underserved areas
2. Develop innovative ways to target underserved youth populations for maximum impact
3. Implement community engagement/outreach efforts prior to deployment of new program related infrastructure
4. Link local food systems to state or national benefits programs to increase access to healthy food for low income populations
5. Implement culturally relevant education and training programs for maximum impact in culturally diverse communities
ECONOMIC
1. Be an innovator in the field - use innovative practices to build your brand and attract outside investment
2. Create partnerships with local institutions of higher learning to improve processes and technologies in a cost effective manner
3. Ensure economic equity through responsible and socially conscious hiring practices and living wages
4. Create opportunities for cottage industry
ENVIRONMENTAL
1. Incorporate goals and processes based on renewable energy and environmentally sustainable practices, from inception
2. Incentivize adoption of environmentally sustainable practices for clients and farm partners
SYSTEMIC
1. Expand the local food system by targeting underserved populations at multiple sites
2. Cultivate strategic relationships with local government stakeholders
3. Acquire industry standard certifications to create linkages between the local food system and the larger commercial food system
4. Expand and adapt mission and mission objectives to accommodate emerging approaches and shifting paradigms
5. Expand monitoring and evaluation efforts to include capture impacts of food system change and identify opportunities that exist for engagement in food system

Table 3: Summary: Strategies to Maximize the Impact & Performance of Urban Agriculture Initiatives

Social Dimension

#1	Identify and target existing infrastructure to scale production in underserved areas
Description:	Identify and target sites with existing infrastructure to scale efforts and build capacity to reach underserved populations. Existing and abandoned sites and buildings situated near low income areas represent key opportunities food system expansion.
Example:	<i>GP excels at this particular strategy by installing hoop houses on underutilized institutional/industrial sites in blighted areas of Milwaukee. Their most recent hoop house installation is located at the site of the former Carrollton Elementary. This school was shut down many years ago and has remained empty, serving as an ongoing source of neighborhood blight. However, in 2012, GP began building hoop houses on the school's concrete parking lot, providing both a source of food and employment for the immediate community and mitigating the effects of blight at that particular site. There are now 26 hoop houses on the Carrollton site and more being deployed at the site of a decommissioned mattress factory. GP is targeting similar sites all over the city to scale its own production efforts and serve a larger segment of low income customers</i>

Table 4: Social Detail: Strategy 1 to Maximize the Impact & Performance of Urban Agriculture Initiatives

#2	Develop innovative ways to target underserved youth populations for maximum impact
Description:	Early intervention is key to improving health and economic outcomes among low income populations. Youth programs and farm and garden partnerships with neighborhood schools and daycares represent an opportunity for early intervention and allow UA initiatives to connect with and make an impact on entire families.
Example:	<i>GP achieves early interventions by targeting youth through its Youth Corps Program, which provides hands on leadership skills training in urban agriculture practices. Another example is GP's day care initiative. In order to reach underserved children, GP donated the supplies and manpower for the installation of community gardens at 50 day care facilities across Milwaukee. MAP's Growing Green program strives to integrate youth development with urban agriculture by employing roughly 50 youth per year across its three sub programs. Growing Green's programs maintain a waiting list each year and represent a diverse group of youth, primarily from Buffalo's West Side. The average age of Growing Green program participants is sixteen. MAP also provides tutoring and mentoring support to high school youths, assistance with financial aid applications and sponsors visits to local colleges. MAP tracks the impacts of its youth programs using graduation rates. One hundred percent of program high school seniors graduated from high school and went onto college for the fourth year in a row in 2012</i>

Table 5: Social Detail: Strategy 2 to Maximize the Impact & Performance of Urban Agriculture Initiatives

#3	Implement community engagement/outreach efforts prior to deployment of new program related infrastructure
Description:	Equitable and socially conscious urban agriculture organizations should allow community residents to voice concerns and ask questions regarding proposed urban agriculture activities in their area. Acquiring advanced acceptance from neighborhood stakeholders helps mitigate potential conflicts and serves to build relationships for future conflict resolution efforts.
Example:	<i>Equitable and socially conscious urban agriculture organizations should allow community residents to voice concerns and ask questions regarding proposed urban agriculture activities in their area. Acquiring advanced acceptance from neighborhood stakeholders helps mitigate potential conflicts and serves to build relationships for future conflict resolution efforts. This is a standard practice for Growing Power as they work to establish urban agriculture sites all over the City of Milwaukee. In both of its most recent hoop house initiatives, Growing Power reached out to site neighbors to introduce the proposed initiative and answer questions and address concerns regarding on site activities. According to Ms. Hughes, GP's experience in Milwaukee is not without conflict; however, conflicts have been relatively minor and easily resolved which she attributes to GP's proactive engagement efforts.</i>

Table 6: Social Detail: Strategy 3 to Maximize the Impact & Performance of Urban Agriculture Initiatives

#4	Link local food systems to state or national benefits programs to increase access to healthy food for low income populations
Description:	Benefits, such as SNAP play an important role for low income households. Coordination with benefits providers and vendors to enable low income consumers to utilize SNAP (formerly Food Stamp) provides access to affordable healthy, nutritious food to underserved populations.
Example:	<i>As manager and administrator of Austin's farmer's markets, the SFC has coordinated with benefits providers and vendors to enable low income consumers to utilize SNAP (formerly Food Stamp) benefits at Austin's farmer's markets. SNAP benefits play an important role in the community for low income households. The SFC's farmers markets allow consumers to double the value of SNAP benefits through their Double Dollar Incentive Program (DDIP), where fruit and vegetable purchases using WIC and SNAP benefits are matched, thereby doubling the purchasing power for low income households buying produce. In 2011, SNAP (Supplemental Nutrition Assistance Program) purchases at the SFC Farmers' totaled \$27,014 in sales. MAP also accepts EBT and SNAP benefits at it Mobile Market program, which delivers food to low income, low access areas in Buffalo.</i>

Table 7: Social Detail: Strategy 4 to Maximize the Impact & Performance of Urban Agriculture Initiatives

#5	Implement culturally relevant education and training programs for maximum impact in culturally diverse communities
Description:	Education and training programs that incorporate culturally relevant curriculums can maximize the reach and impact UA activities by making food and food products familiar and approachable to clients while introducing ways to make healthier meals and nutrition choices at home and at the supermarket.
Example:	<i>In an effort to incorporate an expanded definition of health and healthy foods – to include cultural health – the SFC offers a variety of context sensitive classes in order to reach the Spanish speaking low income communities in Austin. The SFC offers an entire cooking and nutrition series in Spanish, La Cocina Alegre, or The Happy Kitchen. Classes taught in low income communities are taught by peer facilitators, (directly from the community they are serving), and use culturally relevant recipes and cookbooks. Cooking classes are also offered at sites with an existing connection and proximity to the community, as well as free child care. SFC seeks to maximize the reach and impact of its cooking and nutrition programs by making food familiar and approachable to clients while introducing ways to make healthier meals and nutrition choices at home and at the supermarket.</i>

Table 8: Social Detail: Strategy 5 to Maximize the Impact & Performance of Urban Agriculture Initiatives

Economic Dimension

#1	Be an innovator in the field
Description:	Being a leader in innovation allows UA initiatives to create and build a brand, which attracting outside investment and funding for their own capacity building efforts and enhancing their contributions to larger revitalization efforts.
Example:	<i>There is a considerable value add in being an innovator in at least one particular aspect of your field. For example, individuals from public and private sector organizations, from across the country and the globe, flock to GP’s aquaponics training workshops to learn how to install GP-designed aquaponics systems on their own sites. These workshops serve to build GP’s brand and to diversify its revenue stream by creating an additional source of earned income. MAP also excels in this area and recently installed the first commercial scale aquaponics system in the City of Buffalo. This system allows MAP to grow throughout the winter months, to expand sales and training to community members and to regularly sell to restaurants. Ultimately, both GP and MAP have leveraged their reputations as innovators in aquaponics to build their respective brands, thereby attracting outside investment and funding for their own capacity building efforts and enhancing their contributions to larger revitalization efforts.</i>

Table 9: Economic Detail: Strategy 1 to Maximize the Impact & Performance of Urban Agriculture Initiatives

#2	Create partnerships with local institutions of higher learning to improve processes and technologies in a cost effective manner
Description:	Partnerships with local institutions of higher learning, local governments, or private sector entities provide opportunities for low cost research and development of improved technologies, programs, processes and policy efforts to help UA organizations build capacity and serve more people. Technical innovation or refinement of technology and processes can also create substantial time and cost efficiencies for urban agriculture operations.
Example:	<i>Technical innovation or refinement of technology and processes can create substantial time and cost efficiencies for urban agriculture operations. However, the research and development associated with these improvements can be resource heavy and many non-profits do not have the financial capacity to engage in these efforts on their own. Partnerships with local institutions of higher learning, local governments, or private sector entities are an ideal way for non-profit organizations to build capacity. Growing Power is currently partnering with the University of Wisconsin’s School of Freshwater Sciences to determine which one of its four proposed aquaponics systems is the most cost effective and resource efficient. University students have the opportunity to apply their knowledge and skills in a practical environment and GP reaps the benefits of this partnership through a new and improved aquaponics system design.</i>

Table 10: Economic Detail: Strategy 2 to Maximize the Impact & Performance of Urban Agriculture Initiatives

#3	Ensure economic equity through responsible and socially conscious hiring practices and living wages
Description:	Non-profit urban agriculture initiatives are constantly trying to maintain a balance between operational efficiency and social responsibility. Socially conscious hiring practices provide economic opportunities to disadvantaged or low income populations. Non-profits can use the cost savings from renewable energy systems, earned income from fee for service programs and volunteer efforts to pay a living wage to their employees.
Example:	<i>Non-profit urban agriculture initiatives are constantly trying to maintain a balance between operational efficiency and social responsibility. GP has found a way to maintain this balance, while still paying a living wage and offering benefits. Cost savings realized from renewable energy systems, earned income from fee for service programs and volunteers allow GP to hire farm workers starting at \$12 per hour up to \$15 per hour. GP also hires individuals considered unemployable, such as recent refugees and other disenfranchised populations. Ms. Hughes notes that “it might cheaper or easier to hire in another way, but if its your mission to serve people from diverse backgrounds, then that’s what you do”. According to Ms. Hughes, GP applies the same level of intention to carrying out its philosophy on diversity as it does to carrying out its philosophy on renewable and sustainable systems.</i>

Table 11: Economic Detail: Strategy 3 to Maximize the Impact & Performance of Urban Agriculture Initiatives

#4	Create opportunities for cottage industry
Description:	Cottage industry is important to the local food system and to low income families, in particular, who often use cottage industry to address income disparity by maximizing the few assets that are available to them. Implementing cottage industry via enterprise education programs help provide hands-on business experience and leadership training to youth and adults in the urban agriculture field.
Example:	<i>MAP's Youth Enterprise program manages Growing Green Works, a locally owned and operated venture run by urban youth in the Growing Green Program. The GGW venture was implemented in 2006 and serves as an enterprise education program that provides hands-on business experience and leadership training. In this program, youth learn how to create linkages to the local economy using urban agriculture and expand their local food system by developing and marketing organic value added products such as salad dressing, chili starter and salsas made from ingredients taken from the growing green farm site. Products are available at 25 retail sites throughout the city. Andrew Smiley, the Deputy Director of the SFC also emphasized the importance of cottage industry to the local food system and to low income families, in particular, who often use cottage industry to address income disparity by maximizing the few assets that are available to them.</i>

Table 12: Economic Detail: Strategy 4 to Maximize the Impact & Performance of Urban Agriculture Initiatives

Environmental Dimension

#1	Incorporate goals and processes based on renewable energy and environmentally sustainable practices, from inception
Description:	Incorporating sustainable, renewable processes and practices, retroactively is cost intensive. Additionally, closed systems utilizing renewable energy help UA initiatives minimize costs spent on water, energy and waste disposal.
Example:	<i>From the very beginning, GP’s founder, Will Allen looked to renewable energy sources as a framework for his operations. Growing Power is a pioneer of renewably sourced, engineered closed systems (vermiculture, aquaponics) that interact symbiotically to capture energy and reuse waste streams as part of production. For example, Growing Power recycles the leftover substrate from micro-green production through composting, vermiculture and as a food source for its goats. Approximately 70% of its water is heated using a solar panel system and hoop houses are heated with energy provided from adjacent composting operations. Another urban agriculture pioneer, the Massachusetts Avenue Project (MAP) bases its operations on a renewable and sustainable framework. MAP removes an average of 350,000 lbs of food from the municipal waste system per year through composting and diverts 2,634,000 gallons of rainwater from the wastewater system for irrigation for its own cultivation processes. The closed system and renewable energy operations framework utilized by both of these non-profits offers significant cost savings and sets the standard for sustainability in urban agricultural production.</i>

Table 13: Environmental Detail: Strategy 1 to Maximize the Impact & Performance of Urban Agriculture Initiatives

#2	Incentivize adoption of environmentally sustainable practices for clients and farm partners
Description:	The emergence of sustainability as a defining component for contemporary urban agriculture movements has prompted pioneering organizations to incentivize partner organizations to adopt environmentally sensitive practices.
Example:	<i>The SFC does this by paying for partner farmer participation in sustainable agriculture conferences, as well as by providing liability insurance for community garden partners and use of SFC's legal entity name to install water meters in community gardens that utilize only organic practices. In order to incentivize its customers, the SFC distributes free compost through its Spread the Harvest Program and provides free organic fertilizers/compost for Spread the Harvest gardens. They also teach classes on sustainable practices, including cover cropping, composting, seed saving, organic pest control and organic soil amendment</i>

Table 14: Environmental Detail: Strategy 2 to Maximize the Impact & Performance of Urban Agriculture Initiatives

Systemic Dimension

#1	Expand the local food system by targeting underserved populations at multiple sites
Description:	Seek out opportunities for food system expansion by bringing products or production to multiple sites in underserved communities. Lack of physical access is a major contributor to food insecurity and innovative methods such as mobile markets help expand the local food system by bringing access to food and food production to areas, which would otherwise be underserved.
Example:	<i>GP does this by identifying underserved areas and populations within the City of Milwaukee and purposefully selecting these areas as sites for new infrastructure. For example, GP opened a café that serves healthy nutritious food made from local produce and sells its own food products in an area identified the largest food desert in the City of Milwaukee. According to Tammi Hughes, the site selection for the café was by design and was intended to create a distribution site for food products in an otherwise underserved location. MAP targets underserved areas through a Mobile Market program. This program uses a box truck and mobile farm stand to provide organic, locally grown produce to low income neighborhoods in Buffalo that have limited access to farmers markets and grocery stores. The Mobile Market accepts EBT and SNAP benefits at six sites throughout the city to ensure access to affordable produce in areas that are otherwise underserved.</i>

Table 15: Systemic Detail: Strategy 1 to Maximize the Impact & Performance of Urban Agriculture Initiatives

#2	Cultivate strategic relationships with local government stakeholders
Description:	Strategic relationships with local government stakeholders allow UA initiatives to build political clout, which can be used to shape or improve food system policies and urban agriculture zoning laws and protect valuable open space for agricultural uses. Local government stakeholders can also help individual UA organizations incorporate specific food systems and urban agriculture initiatives into larger planning efforts.
Example:	<i>GP has cultivated close relationships with several local government stakeholders in Milwaukee. Both Milwaukee’s Department of City Development and the former alderman for GP’s service area were instrumental in securing the original 2 acre parcel that now serves as GP’s headquarters (McNally). The 2 acre tract, originally owned by the city through a tax lien foreclosure, was initially going to be sold to a local congregation (McNally). However, Milwaukee’s Department of City Development intervened and made contact with the local Alderman, to ensure that the parcel could be utilized for Mr. Allen’s vision of an urban farm providing healthy food, education and jobs to an underserved community (McNally). The former alderman now serves on GP’s board. GP also built relationships with the prior and current Mayors of Milwaukee. Each year, GP sponsors a “Mayor’s” garden in cooperation with the current administration. Tammi Hughes, Communications and Public Relations Manager for GP, noted that its relationships with local government stakeholders have been advantageous for GP and beneficial for larger city planning efforts. Milwaukee’s current Mayor released a sustainability plan in 2013 which incorporates food systems goals and priorities within overarching city planning efforts. GP also partnered with the city’s Office of Environmental Sustainability (OES) to install a community garden in the state’s largest housing project in Milwaukee and is working in conjunction with the OES on a food waste collection program operating out of the same public housing project. Food waste is collected and used in GP’s composting operations, serving as fertilizer for its own cultivation needs, as a source of in kind donations to community garden efforts and as a source of outside revenue.</i>

Table 16: Systemic Detail: Strategy 2 to Maximize the Impact & Performance of Urban Agriculture Initiatives

#3	Acquire industry standard certifications to create linkages between the local food system and the larger commercial food system
Description:	Acquiring nationally recognized or industry standard certifications can provide local UA initiatives with access to the commercial food system. This strategy helps expand distribution of locally grown, organic food to larger, more diverse populations.
Example:	<i>GP recently became GAP (Good Agricultural Practices) certified. GAP certification is a third party auditing program administered by the United States Department of Agriculture. It focuses on best agricultural practices to verify that fruits and vegetables are produced, packed, handled, and stored in the safest manner possible to minimize risks of microbial food hazards. GP needed this certification in order to establish a partnership with Sysco, one of the nation's largest food distributors. In response to market demand, Sysco now offers local, organic products, including those sold by GP. In fact, Sysco donated 34 acres of land just outside its corporate headquarters to help GP establish a local food production operation. Ultimately, certification and GP's newly established partnership with Sysco will help expand distribution of locally grown, organic food to larger, more diverse populations.</i>

Table 17: Systemic Detail: Strategy 3 to Maximize the Impact & Performance of Urban Agriculture Initiatives

#4	Expand and adapt mission and mission objectives to accommodate emerging approaches and shifting paradigms
Description:	UA initiatives engaged in larger revitalization efforts should be aware of trends and shifting food system paradigms for maximum impact on their respective communities. Examples of this include reframing mission and approach to create linkages that expand the local food system and connect it to the larger system, as opposed to missions based on direct provision of products to customers.
Example:	<p><i>Since its founding, the Sustainable Food Center (SFC) has focused on providing access to healthy food and services that enable consumers to make healthier food choices. However, as the concept of health has shifted to include more than just physical health through healthy food, so have SFC’s mission and objectives. Over time, the SFC has incorporated food system approaches and programs that address environmental health, economic health and cultural well being, as well.</i></p> <p><i>Recognizing an emerging trend in the health and human services field, SFC has also incorporated the concept of healthy communities – creating a complex and comprehensive support system that addresses the underlying issues affecting access to food, as opposed to just providing access to food through markets or community gardens. This strategy is particularly relevant for non-profits engaged in revitalization efforts in low income communities, where problems such as poverty, lack of education, low incomes and racial segregation can only be solved with a comprehensive approach. Lastly, the SFC has expanded its mission to focus on food as more than just an end product. The SFC views food as one component of a larger process, starting at the point of cultivation and proceeding through to marketing, preparation, distribution and consumption. By expanding its mission and programs to include interventions at each stage of the process, it can increase individual participation in the local food system, particularly by low income consumers.</i></p>

Table 18: Systemic Detail: Strategy 4 to Maximize the Impact & Performance of Urban Agriculture Initiatives

#5	Expand monitoring and evaluation efforts to include capture impacts of food system change and identify opportunities that exist for engagement in food system.
Description:	Many UA initiatives track individual behavior, knowledge, and attitude changes, such as increased consumption of fruit and vegetables, increased participation in farmers markets, or increased knowledge about food. However, efforts can be expanded to include the creation and tracking of opportunities for individuals to participate as producers, decision makers, and marketers, in local food systems.
Example:	<i>The SFC stills maintains some measures in place to track individual behavior, knowledge, and attitude changes, such as increased consumption of fruit and vegetables, increased participation in farmers markets, or increased knowledge about food. However, it has shifted its focus to creating and tracking opportunities for individuals to participate as producers, decision makers, and marketers, in local food systems. Very little opportunity exists for these kinds of interventions in the commercial food system. In contrast, local community-based food systems provide opportunities for individuals to participate as producers, decision makers and marketers through school gardens, home gardens, and small scale family farms, to name a few. SFC is also attempting to capture these changes in the food system. One example of this is tracking consumer decision making based on shifting values towards environmental and cultural preservation and health. SFC tracks changes using its member database to follow the progress of individual participation in its programs as they progress from one class to another and increases or decrease attendance at farmer’s markets</i>

Table 19: Systemic Detail: Strategy 5 to Maximize the Impact & Performance of Urban Agriculture Initiatives

Appendix A: Evaluation Template

Dimension: Social				
Goal: Build Social Capital & Ensure Social Equity through Urban Agriculture				
Desired Outcomes	Associated Impact Measurements*	Achieved	Tracked	Qty./Desc.
Provide access to affordable, nutritious, and organic food and increase opportunities for access to affordable, locally grown food for low-income populations via benefits programs or expanded distribution efforts	Lbs of locally grown food and produce to city/community residents			
	\$ worth of locally grown food and produce to city/community residents			
	Lbs of organic locally grown food and produce to city/community residents			
	\$ worth of organic locally grown food and produce to city/community residents			
	Lbs of locally grown food and produce to low income individual:			
	\$ worth of locally grown food and produce to low income individual:			
	Lbs of organic locally grown food and produce to low income individuals			
	\$ worth of organic locally grown food and produce to low income individuals			
	\$ worth of SNAP benefits used to purchase food and produce			
	Number of market or distribution sites:			
Number of market or distribution sites in low income census tracts:				
Number of farmers and vendors at markets (managed by subject organization)				
Number of visitors at markets (managed by subject organization)				
Improve health outcomes by providing increased access to youth, adults and disenfranchised populations with food system, urban agriculture and nutrition based education	Number of adults receiving food system and nutrition education			
	Number of hours of food system and nutrition education provided to adults			
	Number of youth (18 years of age or under) receiving food system and nutrition education			
	Number of hours of food system and nutrition education provided to youth (18 years of age or under)			
	Number of adults from disenfranchised populations (addicts, convicts, homeless) receiving food system and nutrition education			
	Number of hours of food system and nutrition education provided to adults from disenfranchised populations (addicts, convicts, homeless)			
Improve employment outcomes for at-risk youth and adults and low-income adults through job training	Number of at-risk youth (18 years of age or under) receiving food system and urban agriculture job training			
	Number of hours of food system and urban agriculture job training provided to at-risk youth (18 years of age or under)			
	Number of low-income adults receiving food system and urban agriculture job training			
	Number of hours of food system and urban agriculture job training provided to low-income adults			
	Number of adults from disenfranchised populations (addicts, convicts, homeless) receiving food system and urban agriculture job training			
	Number of hours of food system and urban agriculture job training provided to adults from disenfranchised populations (addicts, convicts, homeless)			
Reuse of vacant or blighted land to improve community safety and aesthetics through reuse of vacant or blighted parcels	Graduation rate of program participants as compared to overall class graduation rate			
	Number of parcels either under cultivation or being utilized for urban agriculture activities			
Promote community development/engagement & increase stakeholder participation and representation in community development efforts	Number of acres either under cultivation or being utilized for urban agriculture activities			
	Number of volunteers recruited per year			
	Number of volunteer hours per year			
	Number of community/institutional gardens sponsored per year			
	Number of community/institutional gardens sponsored per year in low income census tracts			
	Number of community engagement/outreach initiatives sponsored or administered			
	Number of participants at community engagement/outreach initiatives			
	Percentage of board that are members of an ethnic/racial minority			
	Percentage of staff that are members of an ethnic/racial minority			
	Percentage of board that are members of the local community			
Type and number of potential stakeholders identified for each community engagement outreach initiatives				
Number and type of actual participating stakeholders at community engagement/outreach initiatives				

*Measurements are based on annual totals unless stated otherwise

Dimension: Economic					
Goal: Create Equitable Economic Opportunity through Urban Agriculture					
Desired Outcomes	Associated Impact Measurements*	Achieved	Tracked	Qty./Desc.	
Keep \$ in the local economy	Total value of products sold to local consumers/retailers/restaurants/institutions (by program, if applicable)				
	Program 1:				
	Program 2:				
	Program 3:				
	Program 4:				
	Program 5:				
	Program 6:				
Create industry	Type of cottage industries created Number of cottage industry entities created Revenue (\$) generated from cottage industry entities				
Create jobs	Number of overall jobs created Number of jobs created and filled by neighborhood residents:				
Provide a living wage	Hourly rate (\$) Hourly rate as a percentage of the area wide living wage				
Attract outside investment	Public investment: source (local/state/federal)				
	Public investment: type (funding/infrastructure/land/technical assistance)				
	Public investment: \$ value				
	Private investment: source (corporate/foundation)				
	Private investment: type (funding/infrastructure/land/technical assistance)				
Attract tourism	Private investment: \$ value				
	Number of tourists to facilities				
Increased tax revenue for local governments	Increases in property values of parcels surrounding facilities				

*Measurements are based on annual totals unless stated otherwise

Dimension: Environmental					
Goal: A85 through Urban Agriculture					
Desired Outcomes	Associated Impact Measurements*	Achieved	Tracked	Qty./Desc.	
Recycle and/or repurpose by-products and waste streams	Lbs of castings generated				
	Lbs of fertilizer generated				
	\$ value of castings sold				
	\$ value of fertilizer sold				
	Lbs of compost created (external sources)				
	Lbs of compost created (internal sources)				
	\$ value of compost sold				
	Gallons of stormwater caught and used for operations				
	Gallons of wastewater recycled				
	Create greenspace	Acres of land used for urban agriculture activities			
Acres of land used for organic production					
Number of community gardens created					
Total acreage of community gardens					
Number of community gardens created in low income census tracts					
Mitigate the environmental impacts of agriculture	Total acreage of community gardens in low income census tracts				
	% of operations run using solar energy				
	% of operations heated by composting activities				
	% of fossil fuels used during agriculture activities				
	% of fertilizers used: organic				
	% of pesticides used: organic				
	% of activities mechanized				
% of sites under cultivation, that were former brownfields					

*Measurements are based on annual totals unless stated otherwise

Dimension: Systemic					
Goal: Build & Expand Local Food Systems					
Desired Outcomes	Associated Impact Measurements*	Achieved	Tracked	Qty./Desc.	
Create linkages between key stakeholders in local food system and between the local and larger food system	Number of products sold directly to individual consumer				
	Total value of products sold directly to individual consumer				
	Total value of products sold directly to retailers				
	Total value of products sold directly to restaurants				
	Total value of products sold directly to institutions				
	Total value of products sold directly to distributors/manufacturers				
	Number of partnerships with local school districts				
	Number of partnerships with universities				
	Number of partnerships with local entrepreneurial urban farms				
	Number of partnerships with commercial food providers				
Increase production capacity	Facilities (sq. ft.) or land (acres) added for urban agriculture activities:				
	Facilities (sq. ft.) or land (acres) added for urban agriculture activities in low income census tracts				
	Number of new programs added				
	Number of additional people served by new programs				
Affect positive changes in food systems and urban agriculture policies	Number of additional low income individuals served by new program:				
	Number of local level policy initiatives participated in:				
	Number of state level policy initiatives participated in:				
Number of federal level policy initiatives participated in:					

*Measurements are based on annual totals unless stated otherwise

Appendix B: Interview Questionnaire (SFC)

INTERVIEW - NON-PROFIT URBAN AG INITIATIVE

Hello, my name is Michelle Phares and I'm a Community and Regional Planning Master's student at the University of Texas at Austin. I'm currently working on my Master's Report. My report is about how urban agriculture organizations play a role in economic and social revitalization efforts in their communities. I am reaching out to model non-profit urban agriculture organizations to find out how they affect the social and economic well being of their communities and how these organizations measure their own success. If you have time, I would like to ask you questions about your organization.

Organization: _____ Sustainable Food Center _____

Name: _____ Andrew Smiley _____

Title: _____ Deputy Director _____

Number: _____ 512-220-1080 _____

Email: _____ andrew@sustainablefoodcenter.org _____

1. I'm aware that the current mission of SFC is to cultivate healthy communities by strengthening the local food systems and improving access to nutritious, affordable food. Has SFC's mission changed/expanded since its inception, and if so, how?
2. How does your organization measure success?
3. How does your organization measure its impact on the community?
4. Does the SFC strive to serve a set %age of specific target populations or a specific target area? (minority/low-income populations – low income/high poverty census tracts?)
5. If so, what measures does the SFC take to meet the needs of minority/low income populations in its service area?
6. Like many cities with strong urban ag movements, the majority of urban farming in Austin occurs in an area with a history of low property values and high concentrations of poverty – in this case, Austin's East Side. As you are aware, this area is rapidly gentrifying and naturally there is tension between urban ag proponents and neighborhood/advocacy groups like PODER, which argue that urban farming can be discriminatory and exclusionary with regards to long time residents of the area.

Is the SFC part of the ongoing dialogue between these 2 factions? If so, what role does it play? Do you think it's possible for urban agriculture to flourish on the East Side without compromising the quality of life of long-time residents? If so, what measures could be taken to address this issue?

7. Do you feel that SFC has contributed or is contributing to economic and social revitalization efforts on Austin's East side? If so, in what ways?
8. Do you think the Austin Planning Department is on board with urban agriculture and the potential benefits of urban agriculture in Austin? If so, has it always been that way?
9. What if any, impact do you feel your organization has had on larger city planning efforts related to the implementation of urban agriculture?
10. Do you think SFC's success and or public recognition has impacted the urban agriculture movement in Austin and, if so, how?
11. What does your organization do to ensure that products and services are provided in a way that fosters social and economic equity for all residents in the community?
12. Do you have any mechanisms/incentives in place to promote environmental sustainability among SFC's urban farm and garden partners?
13. My report will include a list of best practices – if you had to name a few best practices – things your organization has done right or is doing well, particularly in terms of fostering social equity, what would they be?
14. My report will also include a list of challenges/setbacks – what challenges has SFC faced since inception and what recommendations would you make to other urban ag initiatives facing the same challenges.

Appendix C Interview Questionnaire (GP)

INTERVIEW – NON-PROFIT URBAN AG INITIATIVE

Hello, my name is Michelle Phares and I'm a Community and Regional Planning Master's student at the University of Texas at Austin. I'm currently working on my Master's Report. My report is about how urban agriculture organizations play a role in economic and social revitalization efforts in their communities. I am reaching out to model non-profit urban agriculture organizations to find out how they affect the social and economic well being of their communities and how these organizations measure their own success. If you have a moment, I would like to ask you a few questions about your organization.

Organization: _____ Growing Power _____

Name: _____ Tammi Hughes _____

Title: _____ Communications & Public Relations Manager _____

Number: _____ 414-527-1546 _____

Email: _____ tami.hughes@growingpower.org _____

1. When did GP acquire its acquire non-profit status?
2. I'm aware that the current mission of GP is to help people from diverse backgrounds, gain equal access to healthy, high-quality, safe and affordable food. Has the mission changed/expanded throughout the years, and if so, how?
3. How does GP measure success?
4. How does GP measure its impact on the community?
5. Does GP track and quantify its impacts? If so, how?
6. Does the GP strive to serve a set %age of specific target populations or a specific target area? (minority/low-income populations – low income/high poverty census tracts?)
7. If so, what measures does the GP take to meet the needs of minority/low income populations in its service area?
8. Do you feel that GP has contributed or is contributing to economic and social revitalization in your community? If so, how?
9. It seems as if both the immediate community and city planning agency are on board with urban ag and the potential benefits of urban agriculture in Milwaukee. Is this the case and if so, has it always been that way? If there have been conflicts, how has GP resolved these conflicts?

10. What if any, impact do you feel your organization has had on larger city planning efforts?
11. Do you think GP's success and or public recognition has impacted the urban agriculture movement in Milwaukee and, if so, how?
12. What does your organization do to ensure that products and services are provided in a way that fosters social, environmental and economic equity for all residents in the community?
13. Does GP have any mechanisms in place to ensure environmental sustainability?
14. Much emphasis is placed on environmental sustainability, but often the financial sustainability of a non-profit is a key to long term, success – what steps, if any, does GP take to ensure that its business model is self-sustaining in the long term? Is GP self-sustaining financially? How important is grant funding to GP?
15. My report will include a list of best practices – if you had to name a few best practices – things GP has done right or is doing well, particularly in terms of fostering social equity, what would they be?
16. My report will also include a list of challenges/setbacks – what challenges has GP faced since inception and what recommendations would you make to other urban ag initiatives facing the same challenges?

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