

Cultivating the Social Field: Strategically moving Urban Agricultural Projects towards Sustainability

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Abstract

The urban landscape requires a shift to a more self-sufficient, healthy and sustainable future. Urban agricultural (UA) projects are one way to do so. This research explores how low-income UA projects in North America and Europe can be supported strategically in moving towards a sustainable future.

The authors analysed UA projects using the 5 Level Framework (5LF) and the Framework for Strategic Sustainable Development (FSSD) to understand their current reality and to help determine sustainable advances within UA projects. Leverage Points were also used as a subsidiary analytical tool to help pinpoint effective actions of change. Research resulted in the creation of Strategic Recommendations and guidance for UA projects to help foster a societal shift towards sustainability.

Keywords: Urban Agriculture, Sustainability, Urban Regeneration, Community Engagement, Strategic Sustainable Development, Systems Thinking

Statement of Contribution

This thesis is a result of a powerful collaboration between Ashley Courtney, Brendan McShane and Ella Wiles. The topic rose from a shared passion; finding innovative ways of addressing the interaction between our urban landscapes, our agricultural system and community resiliency. The team formed over a common goal of creating something useful and practical, a tangible tool for communities to use beyond a thesis and a good grade.

We were fortunate to have a diverse array of personal strengths and motives producing a very competent team, and producing an amazing product through inclusive and equal collaboration. The co-founder of Sweetwater Organics, James Godsil, said: a project requires “creating a balance between theory and practice, talk and work; self and others. It is very important there is someone who is an enterpriser, someone who is a builder type and someone who is a grower. It is necessary to have a good team” (Godsil 2012). Our enjoyable and successful collaboration as a team is due in part, we believe, to the fact that we have one of each.

As our enterpriser, Ella’s strength for visual presentation skills provided an innovative side to our working environment, facilitating many meetings and organizing many of the group’s brainstorming sessions. Her spirit’s playfulness brought light-heartedness to our entire thesis experience, whilst her reach for simplicity helped keep work flowing in a logical manner. Ella’s dedication to excellence and detail is illustrated in the papers, diagrams and all of our presentations. Her cheer, grace and hard work offered a constructive and visually appealing nature to our project.

As our builder, Brendan’s ability to conceptualize and motivate brought forth unique ideas to work with and to build upon. Coming from a background of project management in construction, throughout the entire project he kept the group organized and on task. His leadership skills and ability to envision the final product from inception helped us construct the strong foundation for this thesis, continuously planning the next steps, while focusing on the task at hand. Most of all he led with dedication, perseverance and a considered opinion.

As our grower, Ashley maintained the pulse of our social media presence with great gusto networking with those in the field. Her passion and heartfelt belief to the topic of Urban Agriculture, was infatuating. Her ability to

share this passion has enabled our research to develop connections with some incredible practitioners in the field. Ashley's personal dedication has led this team on an incredible adventure, providing growth to the team and the thesis process.

Without a doubt, working in a group of three tests one's interpersonal skills and work ethics. By maintaining a very open dialogue we were able to stay honest with each other, offering support when needed rather than tension. On reflection, our thesis has exposed the importance and benefits of networking and collaborating with others. As such, we believe this thesis has strengthened life skills, while fostering a relationship amongst us that we hope will continue to grow and evolve along the enjoyable path it has begun.



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Ashley: I would like to thank my family and friends, as I would not be where I am today without you. My gratitude also goes out to my beloved sidekick Cleo who taught me how to live life to its fullest and love unconditionally. I'm sorry I wasn't with you in the last few months of your life; I hope you would be proud of the work we did.

Ella: My gratitude goes out to my dad who led me from a young age to our community allotment; growing up with this space to construct, burn, plant, eat and play was a privilege that taught me a tremendous amount.

Brendan: From working with mom in the garden while growing up, learning the ways from grandparents and gardening in the big city, I have always known and loved the value of being in touch with food. I would like to thank my family for this; for planting the roots of appreciation and hard work in me. Your support and love through all I have done has once again led me well. I would like to dedicate this paper to the memory of my step mom Iris. As a child her garden in High Park was a magical place, and at home, a sanctuary. Her dedication to beauty, life and a love of food will always be cherished.

Tusen Tack.

Executive Summary

The tradition of agriculture has been a prominent variable in our socio-ecological fabric for generations (Mougeot 2005). Currently, food production has become far removed from where the vast majority of today's population live, in cities. This leaves many people disconnected from where their food comes from and unaware to the implications their food consumption has on the ecosystem. The current industrialized food system has been economically driven for efficiency, disregarding our socio-ecological health and wellbeing (Horrigan 2002). As a result, we are witness to systemic increases in anthropogenic pressures on the earth's limited natural resources, deteriorating the capacity of our ecological system to support humanity (Hopwood et al 2005, Steffen et al. 2007).

With the forecasted growth of human population, we are going to need to produce more food worldwide over the next 50 years than has been produced over the past 10,000 years combined (Sexton 2011). Within this same period, 70 – 80% of the global population will live in urban centres (Lopez Moreno 2008). These challenges require a new way of thinking, adopting a systems perspective and deliberate planning towards sustainability. Humanity needs to find innovative ways of undertaking sustainable agriculture practices and reusing land we already have built upon. Urban Agriculture (UA) is one way to foster sustainable communities, reconnecting people to where their food is from and to each other.

Purpose and Scope

Our research looks at UA projects in low-income urban communities in North America and Europe. The target audience for our research are current and prospective UA projects in these communities. The purpose of our research is to strengthen UA projects by recommending strategic actions and guidelines in moving them towards sustainability.

Primary Research Question (PRQ):

How can UA projects be supported in a strategic way that enables a shift towards sustainability?

Secondary Research Questions (SRQ):

SRQ1: What does the FSSD reveal about how UA projects are currently

moving towards sustainability?

SRQ2: How are UA projects acting to impact change within low-income urban communities?

SRQ3: What are the key enablers and barriers to UA projects for a community's shift towards sustainability?

Methods

Our research design was based on Maxwell's Iterative Approach, allowing continual adaptation, ensuring our research questions were being addressed in the most effective and appropriate manner. For a better understanding of the UA system and how to plan for a sustainable future, The Five Level Framework (5LF) and the Framework for Strategic Sustainable Development (FSSD) were the two conceptual frameworks utilized to structure our research. Both frameworks were created for complex system analysis, structuring information gathered into the interwoven levels of: System, Success, Strategic, Actions, and Tools. The 5LF was used first to determine the current reality of UA projects. The FSSD was then used as our primary conceptual framework, to help organize and analyse our research, providing guidance to our Strategic Recommendations. Donella Meadow's theory of 12 Leverage Points was used as a subsidiary analytical tool to gain an in-depth understanding of where UA projects are attempting to create change towards sustainability.

Phase I: Background Research. Addressing SRQ 1, our initial literature review informed the 5LF and the FSSD analyses. This provided a baseline understanding of the current reality for UA projects, while initiating a preliminary vision of the Ideal UA Project and the gap that exists to a sustainable future.

Phase II: Data Gathering and Interpretation. Answering SRQ 2 and 3, this was an intensive period of information sourcing through interviews and Survey data collection. Coding was conducted by a prescribed set of colours and numbers correlating to the five levels of the FSSD and Leverage Points respectively. Literature review continued to supplement additional key findings; while online networking as 'The Urban Cultivation Hub' began to inform upon and connect the researchers with the UA field.

Phase III: Data Analysis. From our Interview and Survey results, 70 prevalent actions emerged as means of achieving the Ideal Project. These

were analysed against the three Prioritisation Questions listed at the Strategic level of the FSSD and a fourth created for the purpose of this study: *Does this action correspond to multiple Leverage Points?* The result produced 25 *Strategic Recommendations* (Appendix I), in which UA projects should consider when planning towards their Ideal Project within a sustainable future. These 25 actions were then analysed against the results of the SRQs. Those explicitly filling the gap or enabling success were carried forward to create a set of 10 Foundational Values. These are values upon which UA projects should build a vision of success and aspire to instil.

Phase IV: Expert Feedback. Members of the ‘Expert Panel’ were sent a summary of our results and an initial prototype of our *Urban Cultivation Guidebook* developed using the results. Feedback validated our results and Guidebook prototype, providing recommendations to a more applicable process. The researchers also visited a wide range of UA projects in Copenhagen, Denmark incorporating further feedback into the final report.

Results

SRQ1: 5LF: Current Reality

System. UA projects are at the interface between the urban sphere and agricultural food production. This relationship is naturally complex with a diverse range of objectives projects work towards. This leads to a fragmented system understanding amongst UA projects. Despite this, there is a strong understanding of systems thinking amongst UA project leaders, yet explicit actions to bridge these systems are lacking.

Success. UA projects share a strong vision of attaining a deep-rooted social sustainability through reconnecting people to nature and to each other. Three primary goals emerged as overarching visions of success focusing on: 1) provision of healthy and fresh food 2) revitalizing neighbourhoods 3) community engagement. Overall, projects lacked an overarching vision of success; exemplified by only 16% having a mission or vision statement.

Strategic. 28% of respondents explicitly indicated they did not have a set strategy for moving towards success. The majority have a day-to-day plan.

Actions. Few preparatory actions are being utilized by UA projects, whilst many projects are acting independent of each other. Actions are primarily reactionary or inspired by other projects rather than strategically planned.

Tools. There is currently no emphasis on specific tools to drive sustainable change or systems thinking by UA practitioners. Instead, tools are being independently sourced for the task at hand.

SRQ1: FSSD: Creating the Ideal Project

System. Complex system thinking is well understood by the UA project and the community it serves. The relationship of interactions within the community, and to other communities is well understood. By understanding the principles that govern our socio-ecological systems a more succinct knowledge of where UA projects fit and operate within the greater socio-ecological system can be reached.

Success. An inclusive purpose, based upon the shared vision of all those involved in the project is created. This helps actions of the UA project to be aligned with the Sustainability Principles.

Strategic. 68% stated the Ideal Project involved increased collaboration. 75% deemed mandatory that UA projects be wide reaching learning organizations, and 76% noted the importance to incorporate the needs of the community. These and the use of backcasting as a methodology for planning, along with the three Prioritization Questions are the basis for strategic guidelines in the Ideal UA Project.

Actions. Actions used are contingent upon individual projects. They are chosen to aid projects moving towards the purpose of success in a sustainable future. The 25 Strategic Recommendations produced through this research could be used as a foundation for additional actions to be created

Tools. For the Ideal Project, a variety of tools such as *The Urban Cultivation Guidebook's ABCD Planning Process* are utilized to aid in implementing actions, monitoring growth and understanding system impacts within low-income urban communities.

SRQ2. How UA projects act to impact change. Meadow's Leverage Point 6 (changing the structure of information flows) was the prominent focus of change amongst UA projects. Leverage Point 3 (changing the goal of the system) was also paramount, with 72% of respondents acknowledging systems thinking and attempting to create change within low-income urban communities. Furthermore, with little acting to stabilize and hold UA projects in check, there was very little attention to Leverage Point 8 (negative feedback loops).

SRQ3. Key enablers and barriers. Predominant enablers emerged as the personal capacity of project leaders, the need to formulate a strong and eclectic team, and having proper infrastructure. UA projects saw the following as primary barriers to success: 80% access to funding, 54% lacking guidance, 42% time, and 40% legalities and bureaucracy.

PRQ. How can UA projects be supported. Interview and Survey results, along with expert feedback informed the creation of 25 recommended actions referred to as Strategic Recommendations for projects to take to most effectively reach their Ideal Project. A further list, the 10 Foundational Values, was deduced, representing characteristics of an Ideal Project that all UA projects should aim to employ. Additionally, a ‘Process for the Ideal Project’ was created to aid in the use and understanding of these Strategic Recommendations and Foundational Values. All included in the *Urban Cultivation Guidebook*, found at the end of this thesis; providing strategic support to UA projects.

Discussion and Conclusion

Currently, projects are acting independently, without a shared vision for success. Further, there is no shared definition of sustainability or agreed upon definitions of UA. Despite not aligning with SSD theory, these factors may also be strengths of the projects allowing for diversity and creativity to flourish through a flexible design and social innovation.

Collaboration and a participatory approach are the key enablers identified by the authors to support such independence. Networking with community stakeholders, such as regulators, educators and health care professionals will encourage an open dialog between projects and the community, ensuring local needs are being supported. The resulting *Urban Cultivation Guidebook* is concrete in design and broad enough to support any UA project in low-income urban communities. The intent is to allow UA projects to create their own vision, necessitating the project to perform a self-analysis while being supplemented by a set of best practices and a step-by-step guiding process leading to a path of sustainability using an SSD approach.

Despite little strategic and regulatory support, UA projects in low-income urban communities are a viable solution for environmental as well as socio-economic sustainability. If these projects collaborate utilising the recommendations and guidance proposed in this paper, UA projects could become effective vehicles to move communities towards sustainability.

Glossary

Aquaponics

A type of gardening that utilizes the symbiotic relationship between fish and plants grown in a closed loop system of circulating water; as the fish's waste is fed to the plants, which cleanse the water and cycle back nutrients to the fish (Martan 2008).

Backcasting

The process of envisioning a desirable future where the principles for success have been met and then planning what needs to be done to move towards that point (Holmberg and Robèrt 2000).

Barrier

Something that hinders forward momentum in moving UA projects to success.

Collaboration

To join forces, working together towards a shared goal.

Community Supported Agriculture

A strategic approach utilized by farmers to receive financial support from their surrounding community to offset the high capital costs of the early season; where members pay upfront costs in the spring to join and in return are guaranteed a certain amount of the produce throughout the season.

Enabler

Something allowing forward momentum to achieving one's goal.

Five Level Framework (5LF)

A conceptual planning tool to aid in complex system analysis, planning and decision making; organizing information within 5 interwoven levels: Systems, Success, Strategic, Action and Tolls (Robèrt 2000).

Food Deserts

An area with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower income neighbourhoods and communities (Ver Ploeg et al. 2009).

Food Security

A concept for when people have physical and economic access to sufficient, safe and nutritious food allowing them to meet their dietary needs for an active and healthy lifestyle. It includes availability of food, stability of food supply, and access to food (FAO 1996).

Food System

The organizations and individuals involved in the production, processing, distribution and consumption of food.

Framework for Strategic Sustainable Development (FSSD)

Application of the Five Level Framework for planning in complex systems to a planning endeavour with sustainability as the desired outcome (Holmberg and Robèrt 2000).

Ideal Project

A project's pinnacle vision of what success would entail. This is a strategic process in which backcasting works from and strategic recommendations guide towards.

Industrial Agriculture

A widely used system of food production where the farm is viewed as a factory with inputs and outputs; the goal is to maximize yield while minimizing production costs, which is usually done by exploiting economies of scale (UCSUSA 2007).

Iterative

A process that feeds back in on itself as more knowledge is gained allowing continuous self-reflection and adaption meeting the needs of new parameters; evolving in an organic, non-linear fashion.

Leverage Points

Outlined by Donella Meadows, these Leverage Points are specific points of power, where small shifts, if employed in a strategic way, can create permanent, systemic changes in a complex system (Meadows 1999).

Low-Income Urban Communities

Areas within a city with high rates of vacant lands, economic disparity and often poor public infrastructure.

Paradigm

Formed from a living being's core assumptions, beliefs, values, and practices, they create one's conceptual understanding of the world's reality.

Participatory Approach

A method that encourages systems thinking and aims to foster sustainable development, by encouraging a democratic approach for individuals to be involved in processes of change. As such it is less prescriptive and non-hierarchical, leading to changes fostered by many and organically evolving to meet contextual needs (Bruges and Smith 2008).

Practitioners

For the context of this paper, a 'practitioner' is a stakeholder in charge of managing, working and/or participating with an urban agricultural project.

Prioritization Questions

Found at the 'strategic' level of the FSSD; these questions help guide a planning process when moving a system towards their vision of success. Utilizing a backcasting approach, these questions help prioritize actions ensuring they are strategic (Holmberg and Robèrt 2000). They include but are not limited to:

- 1) Is the action moving in right direction (towards a vision of success)?
- 2) Is the action a flexible platform (allowing adaptation to the strategy)?
- 3) Is there a sufficient return on investment (social, economic or environmental)?

Sensing the Field

This has to do with collaborative processes, where the wants, needs and dreams of all stakeholders involved are taken into account when planning, or adapting a project.

Strategic Guidelines

Found at the 'Strategic' level of the FSSD; these help guide a planning process when moving a system towards their vision of success. These guidelines include the methodology of backcasting and the prioritization questions listed above (Robèrt 2000).

Strategic Planning

In order to be most effectively and efficiently mobilize change towards a desired future system state decision makers need to know the basic stocks,

flows and resources of the system's current state, in comparison to its vision of success; while also acknowledging the gap in between. From this, backcasting can be utilized to create a map of how to best achieve their vision of success.

Strategic Sustainable Development (SSD)

An approach to bring an unsustainable system towards one that is sustainable. It involves creating a vision of a sustainable society, in line with the Sustainability Principles. The SSD methodology includes backcasting from this vision using the prioritisation questions. For example, using the Framework for Strategic Sustainable Development offers an SSD approach (Holmberg and Robèrt 2000).

Sustainability

The word 'sustainability' stems comes from the Latin *sustinere. Tenere*, to hold, *sus*, up. The verb *sustain* thus links to enduring, supporting and maintaining balance (Cambridge Advanced Learners Dictionary 2008).

Sustainability Challenge

Globally societal design is leading to systemic increases in anthropogenic pressures on the earth's natural resources, challenging the ecosystem's carrying capacity due to a greater rate of consumption than replenishment (Hopwood et al 2005; Robèrt 2000; Steffen et al. 2007).

Sustainable Development

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (UNWCED 1987).

Sustainability Principles

These refer to four scientifically derived principles for socio-ecological sustainability (Holmberg and Robèrt 2000). They have been published and peer-reviewed by the international scientific community and promoted by The Natural Step. They state...

In a sustainable society, nature is not subject to systematically increasing:

- 1...concentrations of substances extracted from the Earth's crust
- 2...concentrations of substances produced by society
- 3...degradation by physical means (Holmberg and Robèrt 2000)
- 4...and in that society, people are not subject to conditions that systematically undermine their capacity to meet their needs (Ny 2006)

Systems Thinking

A science that deals with the organization of logic and integration of disciplines for understanding patterns and relations of complex problems. It is based on understanding connections and relations between seemingly isolated things (Capra 2004).

The Gap

The space, time and resources necessary to move a system from their current reality to their vision of success; strategic support aims to make efforts most effective and efficient.

Third Space

This is a physical space that is neither 'home' nor 'work', where community members can go to regardless of age, gender, race and economic bracket. It is a safe space, with easy accessibility and openness to all. It fosters personal capacity growth, acceptance of intercultural differences and cross community collaboration; connecting people, ideas and information to one another (Oldenburg and Brissett 1983).

Transformational Change

An alteration in the conditions of a person's deep internal values, ethics and/or perceptions potentially leading to shifts in their understanding of the inter-relationships between systems and thus their overarching paradigm.

Triple Bottom Line

A repercussion that affects change across the social, environmental and economic spheres simultaneously.

Urban Agriculture (UA)

The production, processing, and marketing of food in urban and peri-urban areas, through intensive production methods, using and reusing natural resources and urban wastes, to yield a diversity of crops and livestock (UNDP 1996).

Urban Sphere

The physical space held within a city's boundaries. Often a space of high industrial development, population density and economic transactions.

Abbreviations

FSSD Framework for Strategic Sustainable Development.

PRQ Primary Research Question

SRQ Secondary Research Question

SSD Strategic Sustainable Development

UA Urban Agriculture

5LF Five Level Framework

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1 Introduction

The tradition of agriculture has been a prominent variable in our socio-ecological fabric for generations (Mougeot 2005). The domestication of crops and livestock allowed for sedentary communities to arise, fostering the development of our current, modern civilisation (Ramakrishnan 2001). As society increases in size agriculture arose from a global demand for an increased yield. Subsequently, food production has become far removed from where the vast majority of today's population reside, in cities, leaving many people disconnected from where their food comes from and blind to the pressures their food consumption has on the surrounding ecosystem (UNFPA 2011). There is a need to rebuild our civilization's respect for where food comes from and foster resiliency in our food supply. This is not just a matter of ecological health, but for the health of our people as well and the quality of life we all live.

1.1 Sustainability Challenge

Globally, there are systemic increases in anthropogenic pressures on the earth's natural resources, challenging the ecosystem's carrying capacity due to a greater rate of consumption than replenishment (Hopwood et al 2005, Steffen et al. 2007). Moreover, the extraction of materials from the earth's crust and the introduction of synthetic materials into nature is impeding natural flows; undermining humanity's ability to meet their own needs. Such pressures are directly contributing to issues as climate change, economic instability, biodiversity loss, ecological degradation and environmental pollution (IPCC 2007; Worldwatch Institute 2007). The future effects of such issues are largely unknown, as are the consequences to the earth's carrying capacity that will affect the very system humanity relies upon for survival. The funnel in Figure 1.1 represents the deteriorating capacity of the ecological system to support humanity.

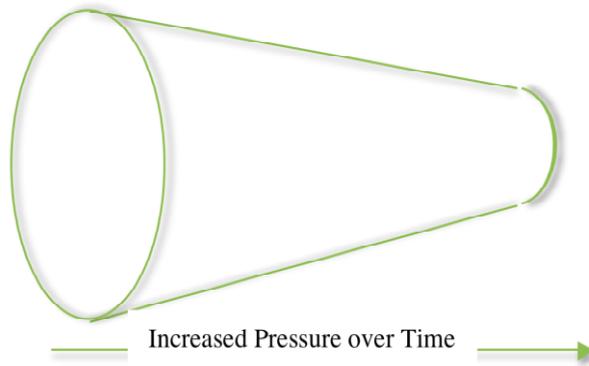


Figure 1.1 The Funnel Metaphor (Robèrt 2000).

The narrowing of the funnel walls represents the weakening ability of the socio-ecological system due to systemic errors in societal design (Robèrt 2000). New practices need to be designed with a sustainable future in mind, allowing natural systems to return to a state of equilibrium; where anthropogenic actions work in harmony with natural processes.

1.2 Agriculture and Sustainability

The current design of the agricultural system is based on achieving economic efficiency; increasing production to meet the demands of a growing global population through industrial style farming with disregard to ecological health (Horrihan 2002). With success measured by a decline in world hunger from 26% to 14% of the global population between 1971 and 2002 (UNFPA 2011), this system, heavily reliant on fossil fuel energy consumption and overuse of natural resources continues to contribute significantly to the sustainability challenge.

Over the past 50 years, society has doubled its demand on the ecological system through intensification of industrial processes (WWF 2010). The agricultural system's usage of these resources is extensive. Currently, 40% of an individual's ecological footprint relates to the food they eat (Turinek

et al. 2010). Irrigation practices account for 70% of global fresh water usage (WWF 2010), and “by 2030...world’s farmers will need 45% more water than today” (Charles 2012, 10). Chemical inputs into soil and continual intensive industrial farming practices are increasing topsoil erosion, reducing soil capacity for agrarian efficiency and undermining the foundation for food production (Tilman et al. 2002; Scott and Conacher 2008).

In addition, the agriculture system is heavily reliant upon fossil fuels. The primary aspect of energy consumption relates to food production and distribution. Food products currently travel on average 1,640km prior to purchase (Weber and Matthews 2008). This requires up to ten times more energy to maintain product longevity and quality than is required to grow the crop initially (Viljoen et al. 2005). With food intended for long distribution networks and mass production, approximately half of harvested food is currently lost in the supply chain (Caballero-Anthony et al. 2010). This causes a 30-50% nutritional loss as a result of the lag between processing and consumption of fruits and vegetables (Weber and Matthews 2008; Bellows 2003).=

Overall, such systematic pressures are leading to increased international attention to global food security. Crop yields are faltering, no longer capable of providing increased yield, due to overuse and degradation of natural resources (Bellows 2003). Yet, demands continue to rise. The FAO predicts between now and 2050 demands for food will rise by 70% due to an increasing population and rising standards of living (FAO 1996). To address these challenges, there is a need to find innovative and sustainable means to farm on land already accessible, already developed. The urban sphere has potential to provide such a space.

1.3 The Urban Sphere

The urban sphere, having vacant lots and many rooftops capable of agriculture production has potential to provide innovative solutions to mediate the sustainability challenge listed above. In a mere century, the population of urban areas has expanded from 15% to 50% of the world’s population (Deelstra and Girardet 2000; United Nations 2008). It is projected that the Earth’s population will increase from the current 7 billion to approximately 9.2 billion in 2050 (FAO 2012). By then, 70 – 80% of the

global population will live in urban centres (Lopez Moreno 2008). Within this same time frame, over 500 cities worldwide will have populations of over one million and 23 cities will host populations of 10 million (Mougeot 2006). This forecasted growth will entail a need to produce more food worldwide over the next 50 years than has been produced over the past 10,000 years combined (Sexton 2011). To meet this demand, an additional landmass the size of Brazil will be required to adequately feed the global population by the year 2050 (Despommier 2009).

Within the urban sphere, low-income communities can be particularly sensitive to challenges instilled from the current food system. These communities are prone to an increasing phenomenon known as food deserts; isolated areas lacking accessible and affordable, fresh, unprocessed, nutritious food (USDA 2009). Moreover, low-income urban communities face limited connections to practices of growing food and hence understanding of where food comes from and the importance of how to nurture a balanced diet (FAO 2001).

1.4 The Need for Strategic Sustainable Development

Agriculture and urbanisation overlap as complex interrelated sub-systems contributing to the complexity of the sustainability challenge. New practices need to be designed to navigate towards a sustainable future. A full systems perspective that uses systems thinking entails that individual properties can only be understood through understanding the dynamics of the whole; producing a better understanding of the role each part plays and how they interact with each other within the larger system of the biosphere (Capra 2004). This acknowledges the need to unite the aspirations and actions of those interacting within complex systems and the sustainability challenge (Ferris et al. 2001). This basis of understanding allows a holistic approach, fundamental when planning or restructuring and an integral part of sustainable development.

1.4.1 Strategic Sustainable Development

The United Nation's Brundtland Commission defines sustainable development as "development that meets the needs of the present without

compromising the ability of future generations to meet their own needs” (UNWCED 1987). Strategic Sustainable Development (SSD) is a methodological approach to sustainable development. There are several key components of the SSD approach. The initial component is to identify the system in question, taking a systems perspective, then, based on an understanding of that system, a vision to be worked towards must be defined. This vision is defined using the scientifically backed four Sustainability Principles. These principles are boundaries for a vision of the system to be designed within sustainable limits. They are general in order to ensure applicability and are designed to inspire and guide creative actions within the capacity of the natural socio-ecological system (Holmberg and Robèrt 2000). The first three outline minimum condition boundaries for natural systems, while the fourth set limits for social sustainability. The four Sustainability Principles state:

In a sustainable society, nature is not subject to systematically increasing:

- 1 ...concentrations of substances extracted from the Earth’s crust;
- 2 ...concentrations of substances produced by society;
- 3 ...degradation by physical means (Holmberg and Robèrt 2000);
- 4 ... and in that society, people are not subject to conditions that systematically undermine their capacity to meet their needs (Ny 2006).

To be sure the actions taken are strategic within a complex system, SSD utilizes the methodology called backcasting. This methodology is a strategic approach, using a shared vision as a reference point in the future; looking back to the current reality, prioritization guidelines are used to help determine what actions will be most effective to reach that vision by asking “what do we need to do to get from here to there?” (Dreborg 1996; Holmberg and Robèrt 2000).

SSD and a whole systems perspective are mutually beneficial, ensuring decision makers are aware of the entirety of the system, its players and impacts in order to navigate the most strategic path towards sustainability.

1.4.2 Urban Areas: An Arena for Sustainable Development

Urban areas can be a platform for catalysing a sustainable shift in understanding humanities relationship to the production of food. Further, low-income urban communities hold a particularly vulnerable population that would benefit greatly from this understanding and an SSD approach.

The urban sphere, “the quintessential example of a complex adaptive system” (Batty et al. 2004) has demonstrated an ability to be adaptive and innovative for change. As drivers of economic growth, creativity and co-creation through providing collaborative spaces like Third Spaces¹, cities provide unique opportunities in rallying creative thinking for solving complex issues (Oldenburg & Brissett 1983). Urban spheres are at the epicentre of technological advances (Steel 2009) such as recycling programs, green building and retrofitting techniques, and are spawning grassroots initiatives such as Wally Satzewich’s Spin Farming² and Britta Riley’s WindowFarms³; or entrepreneurial rooftop agriculture practices such as Brightfarms⁴ and advanced indoor LED light growing techniques like MetFarms⁵. Technology and our interaction with that technology in the urban sphere is advancing quickly. Such advances will not only create spill-

¹ Third Spaces are places where community members can go that is neither ‘home’ nor ‘work’.

² An intensive growing method that aims to make an economic profit from farming within urban spheres; growing a large quantity of diverse produce and taking into consideration the importance of maintaining a healthy balance with their ecosystem (SPIN Farming 2012).

³ To develop and share information on how to best implement simple growing techniques, this social enterprise was created and attempts to continually develop and share ideas through an online collaborative platform (Windowfarms 2012).

⁴ An urban, for profit, rooftop agricultural project that has partnered with a grocery store located within the building below; in which all fresh produce is supplied (Brightfarms 2012).

⁵ An attempt at growing food intensively within an urban sphere utilizing vacant buildings; taking advantage of LED lights, Hydroponic, and Aquaponic technologies (Metfarms 2012).

over effects into local economies, but further stimulate urban communities to embrace sustainable approaches to strengthen community resiliency (Holling 2001).

1.5 Urban Agriculture

Increasing population and the associated demands on the agricultural system, combined with the potential urban spheres hold for innovative SSD, a strategy to mediate the sustainability challenge is urban agriculture.

A definition of urban agriculture (UA) can be understood as “an activity that produces, processes, and markets food and other products, on land and water in urban and peri-urban areas, applying intensive production methods, and (re)using natural resources and urban wastes, to yield a diversity of crops and livestock” (UNDP 1996).

UA is very broad in activities and scope, ranging from, but not limited to: backyard gardens, apiculture, Aquaponics, rooftop gardens, aquaculture, livestock rearing, community gardens, community supported agriculture, vertical agriculture⁶, allotment gardens⁷, curb-side gardens, and schoolyard gardens (Mendes et. al 2008). With today’s society consisting of diverse array of demographics, many initiatives will be necessary to bridge not only the sustainability challenges, but also the challenges of meeting culturally varied and healthy food requirements. As such, the definition of UA is contingent upon the urban environment in which it is practiced. Therefore, it is important to note how each city and every project will carry their own unique interpretation of UA with the premise focused on the above definition.

⁶ A growing technique grown in a vertical plain; reducing the agricultural footprint on valuable space within urban areas (Despommier 2009).

⁷ A community garden in which individuals and/or their families are assigned a plot they can maintain and harvest their own produce within.

1.5.1 History and Popularity

UA has its roots in the hanging gardens of Babylon and the terraced growing fields of Machu Picchu; it is a practice that is thousands of years old. Throughout recent history, trends have emerged showing UA initiatives growing in popularity during periods of war⁸, or allotment gardens in times of recession or economic recovery (Broadway 2009; Hanna and Oh 2000).

Current UA projects have been driven by factors such as increasing income disparity, rising food costs, globalization of the food system and the need for strengthened community bonds (Broadway 2009). It is estimated that over 800 million people are now practicing UA, producing approximately 20% of the global food supply including over 30% of all farms within the United States being within urban centres (Brown and Carter 2003; Mougeot 2006; UNDP 1996).

An increase in international attention, such as the UN Urban Habitat conference held in Istanbul in 1996 promoting UA as a means to attain human rights (FAO 2006) and Seattle hosting 2010 as the year of UA, help exemplify the recognition of UA's growing popularity. As global communities continue to develop technological advances in sustainable techniques, specifically those aiding UA projects, society is exposed to how UA is a means of improving community bonds, securing healthy, resilient and accessible food supplies (Ferris et al. 2001).

1.6 Sustainability Benefits of Urban Agricultural Projects

Beyond simply providing food, UA projects are becoming a vehicle to develop a healthy socio-economic community. Projects offer many environmental, social and economic benefits, providing solutions for urban

⁸ During periods of war, North America and Europe promoted urban vegetable gardens in order to ensure food security for their civilians (Pollan 2008).

areas contributions to the sustainability challenge. There is an increasing understanding of the value UA projects have as powerful vehicles for tackling these intimately linked sustainability issues associated with the complex systems of urban areas (Bulkeley and Betsill 2005).

Some of the benefits UA provides include:

Environmental benefits

- Natural resource usage, such as water and soil, is less in urban spheres as more intensive growing practices take place on smaller scales (Webb 1998).
- Localization of food production reduces energy consumption; food travel miles are shortened between field and plate (Broadway 2009).
- UA fosters increased accessibility to environmental education, awareness and dialogue, advocating sustainability in city planning (Smith 2008).
- UA increases ecological habitat for inner city flora and fauna to flourish, particularly proving a habitat for insects, birds and urban foragers (Bellows 2003).
- The production of food crops, trees, shrubs and ornamental plants can beautify the city; cool its climate and filter air pollution (Mougeot 2005).
- Revitalization of brownfield sites contributes to storm water retention by increasing permeable land areas and improving the purity of runoff water by filtering pollutants (Schadek et al. 2009).

Engagement, Resiliency and Community Building

- UA's small-scale production can reconnect community members with nature, offering them accessible and affordable food while fostering an understanding in the importance of a healthy diet (Bellows 2003).
- UA projects provide a space that is managed by local members of the community, empowering participants to work with and for their local community in solidarity (Coleman & Gotze 2001).
- The presence of vegetable gardens in inner-city neighbourhoods is positively correlated with community resiliency; decreasing crime, trash dumping, juvenile delinquency and drug and alcohol abuse (Bellows 2003).
- The community manages their own food supply of nutritious, healthy food, increasing food security (Mougeot 2006).

- An increase in biophilia⁹ and understanding of the processes affecting our food.

Opportunity for local Economic Development

- UA provides opportunities for community development through education and job skills training and entrepreneurial opportunities (Armstrong 2000).
- The money that consumers spend is kept at the local level, adding economic wealth to the area they are situated in (Viljoen et al. 2005).

1.7 Considerations when Planning UA Projects

When planning a UA project, it is important to note success is contingent upon many variables. Two overarching variables to consider include:

Urban land is a valuable commodity, sought for multiple purposes by residents, city planners and developers. Demand for limited resources causes urban land to be expensive; potentially out of reach of small-scale UA projects. Industry and services that take up this valuable space may provide similar benefits to UA, therefore planning of a UA project needs to illustrate its capability to be profitable and purposeful, fulfilling the direct needs of the community.

There is surprisingly little information or support from municipal, legal and industry leaders for UA projects. Bureaucratic ordinances restrict farming practices within the urban landscape due to zoning restrictions and preferences or understanding of local stakeholders. As people learn the values and importance of UA however, legislations can change and support can be won. For example, in 2010 bee keeping in New York was finally

⁹ Biophilia is the universal human appreciation for nature. It is the subconscious bond that allows contentment and relaxation while near natural environments, and the love of living systems all beings possess (Simaika and Samways 2010).

legalised following a campaign to remove bees from the ‘ferocious animals’ list (Navarro 2010).

1.7.1 The Gap Identified

As noted previously, UA projects have the capability to provide many positive attributes to environmental, economic and social repercussions (Bellows 2003). Many studies advocate the benefits of UA (Ferris et.al 2001; Traveline and Hunold 2010; Spencer 2011; van den Berg et al. 2010), stating how UA should be designed into cities wanting to become more sustainable (Codoban and Kennedy 2008; Mason and Knowd 2010; Smith 2008; Lieberherr-Gardiol 2009; Rojas-Valencia et al. 2011; Smit and Nasr 1992; Weber and Matthews 2008;) and how UA can make communities more resilient (Ernstson et al. 2010; Pearson et al. 2010 Caballero- Anthony et al. 2011; Tidball and Krasney 2011).

Although urban areas have much to gain from UA, how to access those benefits remains unresolved. Projects face limited strategic guidance to support them (Armar-Klemesu 1999; Brown and Jameton 2000; Smit and Nasr 1992), lacking a collaborative or strategic planning process (McEvily 2012; Susman 2012), limiting success when implementing and maintaining projects (Aide and Grau 2004; NAUPUAA 2007). This ad-hoc fashion is leading many UA projects to evolve organically and independently; each finding solutions to many barriers affecting them, with little support from municipal, legal and industry decision makers (Mougeot 2006).

1.8 Research Purpose

The purpose of this paper is to explore how UA projects in low-income urban communities can be supported in a strategic way to strengthen a community’s shift towards sustainability. By utilising an SSD perspective, this thesis will explore how UA projects in low-income urban communities can be supported in identifying the most strategic path towards sustainability, and identify the needs and resources required to empower UA projects.

The intended outcomes are:

- Determine how UA project can be supported in a strategic way, moving

cities towards sustainability, and to...

- Identify the needs and resources to empower UA projects.

1.9 Scope

This paper focuses on UA projects within low-income urban communities within society within the ecosphere making up a complex system, as illustrated in Figure 1.2. The scope will focus upon the interface between low-income urban communities and the urban agricultural projects within those areas, within society, within the ecosphere, as illustrated in figure 1.2.

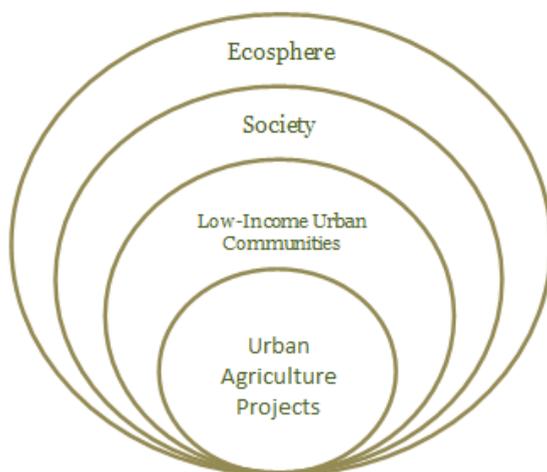


Figure 1.2 Scope of Research

The target audience of this thesis are current and prospective UA projects in low-income, urban areas of North America and Europe.

1.9.1 Research Questions

To achieve the purpose of our research, the following questions were developed with the aim to identify how UA projects can be strategically supported:

Primary Research Question (PRQ):

How can UA projects be supported in a strategic way that enables a community shift towards sustainability?

Secondary Research Questions (SRQ):

SRQ 1: What does the FSSD reveal about how UA projects are currently moving towards sustainability?

SRQ2: How are UA projects acting to impact change within low-income urban communities?

SRQ3: What are the key enablers and barriers to UA projects for a community's shift towards sustainability?

1.9.2 Assumptions and Limitations

This paper will not address key environmental debates in the agriculture system, such as organic vs. non-organic production, application of pesticides (including herbicides, fungicides, and insecticides) and fertilizers, and the potential repercussions of such activities affecting watersheds, biodiversity and human health in urban areas.

The authors of this paper recognize the importance of a whole systems perspective and that UA is not a singular solution to the sustainability challenge. With this, it is assumed that UA is not in competition with industrial agriculture or capable of providing the output required to sustain a growing global population.

2 Methodology

To answer the PRQ, Joseph Maxwell's *Interactive Model for Research Design: An Interactive Approach* was used as the research methodology. This incorporates an iterative process in which layers of research occur simultaneously; ensuring reflection and reassessment throughout the research. This methodology allowed flexibility for research adaptation; a process necessary for compiling an action plan based on research and advice from practitioners (Maxwell 2005).

2.1 Conceptual Frameworks

Three conceptual frameworks were used to help analyse and structure our research for an overall systems perspective: the Five-Level Framework, the Framework for Strategic Sustainable Development and Donella Meadows theory of Leverage Points.

2.1.1 Five Level Framework (5LF)

The Five Level Framework (5LF) is a conceptual framework, allowing a simplified understanding of the many elements that make up a UA project. Information is structured into the respective five levels, represented in Figure 2.1: Systems, Success, Strategic, Actions, and Tools. This framework aids in analysis of complex systems, decision-making and planning; applicable to provide support across a broad system contingent (Robèrt 2002). The 5LF was used to determine the current reality of UA projects in low-income communities.

The interrelating levels of the 5LF include:

Systems Level. An overarching systems perspective is taken to understand the context of the specific system under analysis. This can assist in understanding, describing and analysing the dynamic relationships between ecological and social systems (Waldron et al. 2008). Understanding a variety of parts within a system is imperative for a whole-systems perspective, providing structure to shape and guide every subsequent level.

Success Level. Success is based upon defining an overall goal or vision. This is an understanding of the desired future projects and practitioners are working towards, through a shared purpose and value. This is the foundation of any planning process thus necessary prior to any strategic action being implemented (Robèrt 2000).

Strategic. This level encompasses Strategic Guidelines to be used in the planning process moving towards the vision of success. Once a vision of success is created, backcasting (see section 1.3.2) to the current reality allows strategic planning to begin (Dreborg 1996). The following three prioritisation questions ensure actions are strategic in attaining a project's vision of success (Holmberg and Robèrt 2000).

- 1) Is the action a step in the right direction with respect to the vision?
- 2) Is the action a flexible platform for future improvement?
- 3) Is the action likely to produce a sufficient return on investment?

Actions. Actions are concrete initiatives, prioritized by the Strategic Guidelines to move a system towards its vision of success.

Tools. Tools foster how the chosen actions are accomplished to aid work towards success. They encompass any methods, techniques, monitoring and management used alongside backcasting and the three Prioritization Questions to move towards a vision of success.



Figure 2.1

The Five Level Framework
(Robèrt 2000)

2.1.2 Framework for Strategic Sustainable Development (FSSD)

The Framework for Strategic Sustainable Development (FSSD) is a scientifically rigorous, peer reviewed tool for successful planning towards sustainability. It builds upon the 5LF's (Figure 2.1) holistic systems structure and Strategic Guidelines, incorporating scientifically based

principles for a sustainable society (Robèrt 2000).

The FSSD incorporates the following components into the model:

At the *Systems* level the FSSD places an emphasis of the project within society, within the ecosphere; creating awareness of the entire socio-ecological system.

The *Success* level is based upon creating a vision of success which is in compliance with the Sustainability Principles, outlined in section 1.3.1.

The *Strategic* level places emphasis on backcasting from this vision of success utilizing the three Prioritization Questions outlined in the 5LF (section 2.1.2) as a minimum to create a strategic plan for a project to implement stepping stones towards success.

Actions and *Tools* level are the same as the 5LF with focus upon an SSD perspective. Actions are concrete in design, intentionally planned and implemented to move towards sustainability. Tools help actions chosen to move towards sustainability.

For this research, the FSSD was employed as the primary conceptual framework for organizing and analysing data. It was used to create an 'Ideal Project', which is a project's pinnacle vision of what success would entail, with complete compliance with the Sustainability Principles. This is the point from which backcasting works and towards which strategic recommendations guide.

2.1.3 Leverage Points

Donella Meadow's theory of 12 Leverage Points (Figure 2.2) looks at specific points of power where small shifts can create big changes in complex systems (Meadows 1999). This theory, understood by the researchers to be non-scientific, was used as a subsidiary analytical tool alongside the FSSD to organize and analyse research data; to determine where the primary focus of current UA projects lies to help answer SRQ2. The 12 Leverage Points are described here from the easiest to implement, yet only creates minor changes; to most difficult to implement, but has the potential to create maximum change:

12. *Changes in constants, parameters and numbers.* The alteration of system parameters, such as the numerical limits are believed to help keep a system functioning, or bring a faulty system back to an agreed upon safe range. This is the most popular means in which decision makers place most of their attention. Meadows' states these levers have minimal impact despite being the easiest point of intervention. This is because these levers do not attempt to change the root of the problem, vis-à-vis the motivations, beliefs or values behind an individual's behaviour (Meadows 1999).

11. *The size of buffers and other stabilizing stocks, relative to their flows.* Buffers have the potential to protect a system from fluctuations to a given state, as they are able to mitigate the shock of an impact, therefore increasing the capacity of the buffer can help stabilize the system (Meadows 1999). Meadows notes changes at this Leverage Point can improve the state of a system however these leverages are often physical entities that are costly to implement and can require large investments to affix change (Meadows 1999).

12. Constants, parameters & numbers
11. The sizes of buffers relative to flows
10. Structure of material stocks & flows
9. Lengths of delays
8. Negative feedback loops
7. Positive feedback loops
6. Flow of information
5. Rules of the system
4. Power to self-organize
3. Goals of the system
2. Paradigm the system arises from
1. Transcend paradigms

Figure 2.2 12 Leverage Points
(Meadows 1999)

10. *The structure of material stocks and flows.* Changing the physical structure of the material stocks and flows, such as transport networks and population age structures can have great impact on the functionality of a system. In general, changing the structures of flows usually entails a transformation of physical support structures already existing, which can be very costly to implement (Meadows 1999).

9. *Change the length of delays; relative to rate of system change.* A delay is the time between a change being instigated and the change actually becoming visible and/or taking effect. When a delay is too short, an overreaction may occur, yet, if the delay is too long, the reaction tends to result in an unpredictable and inefficient manner (Meadows 1999).

8. *Strength of negative feedback loops.* A negative feedback loop slows down a process, promoting stability within a system boundary. However, if a system is changing too quickly, or is subject to instability, identifying the negative feedback loops can often yield simple and effective impacts (Meadows 1999).

7. *Driving positive feedback loops.* Positive feedback loops are actions within a system that are self-reinforcing, similar to that of a domino effect “...the more it works, the more it gains power to work some more” (Meadows 1999). This Leverage Point acts as a stimulant to growth behaviours within the system, however must be monitored as such loops have the potential to be self-destructive (Meadows 1999).

6. *Change the structure of information flows.* Changing who monitors information of a system and who has access to information about a system, this leverage is generally easier and cheaper to implement than changing any other aspect of a system. This is a very powerful Leverage Points as it often fosters behavioural change (Meadows 1999).

5. *Changing the rules of the system structure.* The rules of a system structure are imposed through factors such as incentives, punishments and constraints. This Leverage Point can lead to immediate effects on the system itself, and if they are properly enforced, becomes a strong lever to impact change within a complex system (Meadows 1999).

4. *The power to add, change, evolve, or self-organize.* This point determines system resilience and is in regards to a system that can autonomously remain flexible with the ability to self-organize, holding the capacity to withstand any change and evolve over time (Meadows 1999).

3. *Change the goal of the system.* Changing the goal of the system is challenging, as it is the guiding paradigm of how one understands the world. This lever has much potential for creating drastic system change; defining areas that need actions to meet those goals setting the direction of the system (Meadows 2008).

2. *Change the mind-set out of which the system arises.* To change the mind-set out of which a system arises requires being able to change the underlying values of the individuals involved. This goes beyond having members of a community agree to act upon system change, but instead

changing their underlying values to desire the change (Meadows 1999).

1. The power to transcend paradigms. This Leverage Point assumes all people are connected to a paradigm unique to the community in which they are part of. The power to transcend paradigms is to let go into the unknown, allowing the future to emerge without assumption or preconception. It is to be enlightened into transcendence. As much as it is the most challenging Leverage Point to implement, it has the potential to have the largest impact on a complex system (Meadows 1999).

2.2 Enablers and Barriers

To answer SRQ3, specific questions in our Interviews and Surveys focused on enablers and barriers. For this study, the definition of an enabler is something allowing forward momentum in achieving one's goal and a barrier is something that hinders forward momentum in achieving one's goal. Questions sought to determine what common enablers UA projects gained from, and what barriers UA projects faced, along with actions utilized to overcome barriers. See Appendix B- Interview Questions and C- Survey Questions for the complete list of questions asked.

Results were harvested and repetitions quantified, allowing prioritization of the most prevalent enablers and barriers encountered by projects in moving communities towards sustainability.

2.3 Research Phases

Research was divided into four interwoven phases, iteratively building upon one another, utilizing diverse research methods to gather data to answer SRQ's 1, 2, and 3. Maxwell's iterative design led to continuous feeding of data into subsequent phases as it was collected, subsequently synthesising all information to answer the PRQ. This iterative approach is illustrated in Figure 2.3 below:

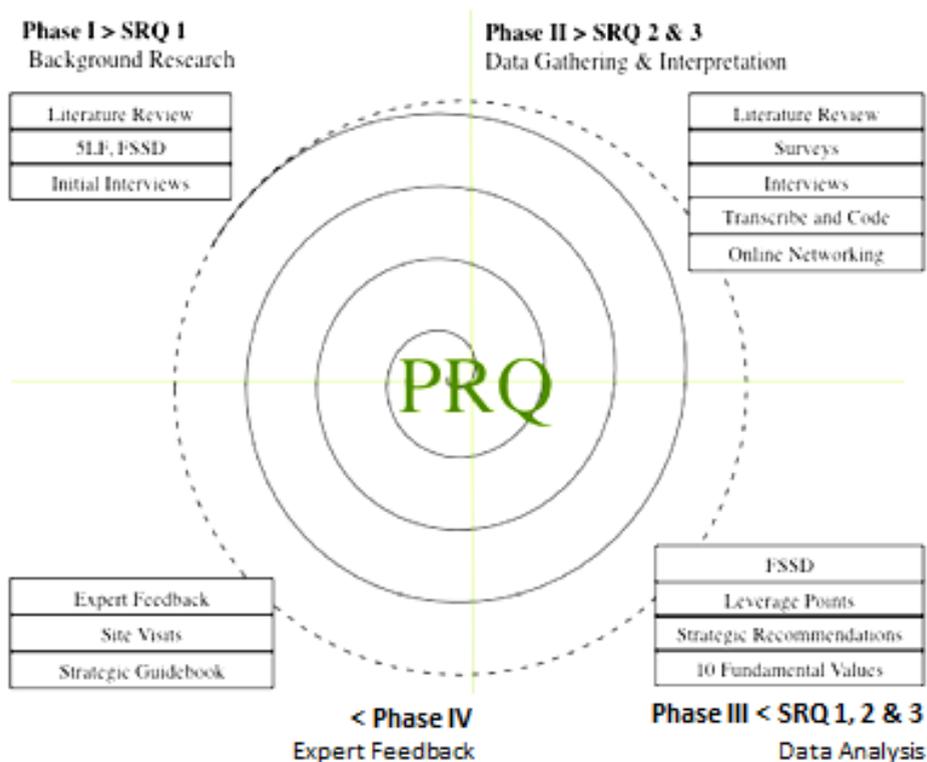


Figure 2.3 Research Phases

2.3.1 Phase 1: Background Research

To answer SRQ 1, a generic 5LF and the FSSD were used. As information was gathered, results were mapped to the 5LF to build the current reality. Simultaneously, results aligning with the Ideal Project were filtered into the FSSD. This provided a baseline understanding of the current reality of UA projects, a vision of their Ideal Project and the gap that exists.

Throughout this phase the authors utilized a broad scope of research mediums that included academic papers, journal articles, online forums, websites, books, web based conferences, industry reports and magazine articles.

Key search words utilized include: agriculture, environmental impacts of

agriculture, industrial agriculture, food insecurity, food deserts, urbanization, environmental education, community engagement, urban agriculture, history of urban agriculture, urban farming, community benefits, inner city, low-income urban communities, resiliency, food miles, city policy, leaders of urban agriculture, green technology, permaculture, vertical farms, rooftop farms, Aquaponics, hydroponics, spin farming, community gardens, community supported agriculture, social equity and green land retrofitting.

2.3.2 Phase 2: Data Gathering

Answering SRQ 2 and 3, Phase 2 was an intensive period of information sourcing through Interviews and Surveys.

Literature Review. Research was continued from Phase 1 and expanded to include literature on Donella Meadows's theory of 12 Leverage Points (Meadows 1999; Meadows 2008).

Networking. Online networking, through Facebook and Twitter began in Phase 2 as the '*The Urban Cultivation Hub*', providing a direct means of communication with current UA practitioners and UA projects. From this networking we were able to attain contacts for Interviews, while staying informed with what was happening in the UA field.

Interviews. Interviews were conducted with 23 UA project practitioners and experts within our research scope within the UA field. Refer to Appendix A for a list of all those interviewed. Interviewees were chosen that met the following requirements:

- i. Have been established for three or more years.
- ii. Are accessible to the community, allowing for personal capacity and educational development.
- iii. Provide accessible, fresh produce to people within the low-income urban community within which the project operates.
- iv. Advocate participation from the local community (i.e. local employment).
- v. Maintain a diverse production beyond just agricultural products.

Interviews were conducted via Skype or telephone, equally hosted between the three researchers. All Interviews were recorded for transcription and

future review. All Interview questions are outlined in Appendix B.

Survey. A ten-question Survey was created on SurveyMonkey¹⁰ and was distributed via email to an additional 23 UA projects throughout North America and Europe. See Appendix C for a complete list of Survey questions.

Transcription and Coding. Interviews were transcribed by the researcher who conducted the Interview. The two other researchers then coded transcriptions respectively, checking for continuity and eliminating overlooked of data. Coding was conducted using a prescribed set of colours and numbers, determined by the researchers. A coding key (Appendix D) was compiled, relating all colours and numbers to the information represented, ensuring continuity between the three researchers during this process. Five colours, correlating to the five levels of the 5LF were employed to categorize data into the framework. Additionally, Leverage Points were coded numerically, between one and twelve, corresponding to the Leverage Point for ease of categorization and analysis.

An additional 6th colour was used to code Enablers and Barriers, utilizing an [E] or [B] to identify information related to these research points. Actions to overcome barriers were identified in the same manner with an [A]. A sample of this process can be seen in Appendix E.

2.3.3 Phase 3: Data Analysis

To answer all three SRQs, in Phase 3 data collected in previous phases was analysed. All information, colour and number coded, was synthesised into a main databank. Data was categorized into the 5LF, FSSD, Leverage Points, enablers, barriers and actions to overcome those barriers. Subsequent categories of advice, needs of UA projects and benefits of UA were also structured to aid in determining the current reality and actions that could be prioritized in future stages. Noting repetition of information extracted provided strength as to how UA projects are operating and where UA projects are impacting change within a complex system.

¹⁰ A free online platform that aids in the organization, distribution, collection and analysis of questions to a chosen audience

Gap Analysis between the 5LF and the FSSD. Outlined in section 2.3.1, information on the current reality was collected throughout the research period, providing an in-depth understanding of the current reality of UA projects. Through the lens of the FSSD, an ‘Ideal Project’ was created, providing a future vision of success in which to strategically plan towards sustainability. Gaps were then identified at each of the levels to produce Strategic Recommendations to support UA projects.

Leverage Points. Results from Interviews and Surveys were correlated to the 12 Leverage Points, outlined in Figure 2.2, to help identify where UA projects are acting to impact change. This helped the organization and analysis of the research, identifying specific actions that could be utilized for greater impact or increased opportunity from UA projects.

Creation of Strategic Recommendations. The purpose of creating Strategic Recommendations was to move past theory, and provide tangible actions based on a rigorous FSSD analysis. This was implemented to help UA projects reach their vision of success by providing strategic actions in how projects may overcome barriers, fill in gaps and carry forward enablers as per the results of our SRQ analysis. This resulted in a condensed list of 70 prevalent actions. Moving towards a vision of success, at the strategic level of the Ideal Project (outlined in Section 2.1.3), actions were analysed against the three prioritization questions of the FSSD (See 2.1.2) and a fourth created for the purpose of this study: *Does this action correspond to multiple Leverage Points?*

Utilizing a ranking scale of -3 to +3, a list of 25 Strategic Recommendations was produced (Appendix I), as a result of those actions scoring highest to the four prioritization questions. A sample of this matrix is shown in Appendix F.

Foundational Values. The list of recommendations was then analysed against the results of our SRQs; determining the most effective at bridging the gap identified and promoting enablers to reach success. 10 actions emerged as best suited for most effectively moving a UA project towards success. These actions were transformed to Foundational Values that all UA projects should employ as a means of moving towards a sustainable future (see section 3.4). These 10 Foundational Values have been added at the Success level of the Ideal Project, as descriptive characteristics projects should employ.

2.3.4 Phase 4: Expert Feedback

Expert Feedback. From our Interviewee list of successful UA projects, 15 practitioners with eclectic and experienced backgrounds were contacted to be on our expert panel (see Appendix G). A draft of the executive summary of this paper, 25 Strategic Recommendations and the 10 Foundational Values were sent to these experts. Feedback was used to validate the results and deliverable, providing recommendations to a more applicable process. Amendments of the results were made, strengthening the final deliverable and producing a complete *Urban Cultivation* Guidebook (Appendix J); supporting UA projects with strategy, actions and a process to reach the Ideal Project.

Site Visits. To further validate the results, the researchers visited a wide range of UA projects in Copenhagen, Denmark (see Appendix H). Feedback from those UA projects was then incorporated into the final report.

3 Results

Results from our research are discussed with focus on the SRQs, together contributing to answering the PRQ. The research period started with identifying the current reality and the Ideal Case of UA projects in low-income urban communities in North America and Europe; identifying the gap in which strategic support could be provided. From 86 UA projects contacted, 25 confirmed for Interviews, with 23 final participants. Of the Surveys' sent to 100 UA projects, 23 were completed. To illustrate the prevalence of an action shared amongst UA projects, results from the surveys and Interviews have been combined and quantified into percentage scores.

3.1 The Current Reality and the Ideal Project: Identifying the Gap

In answering SRQ1, results were organised at each of the five levels of the 5LF and the FSSD to outline both the current reality and the Ideal Project. Backcasting from this Ideal Project, gaps were uncovered in which Strategic Recommendations could be offered to move UA projects towards their Ideal Project and, in turn, their communities towards sustainability. See Table 3.1 for a summary of the results.

3.1.1 Analysis of the 5LF: The Current Reality

Systems. The system in which UA projects operate is naturally complex due to the dynamic nature of the various inputs and outputs urban spheres constantly utilize and depend upon. The current UA system includes the interface of the urban sphere and agricultural food production. This includes individuals, public and private organizations and community groups (i.e. youth, neighbourhood and church groups) producers and consumers of the projects' produce. With physical infrastructure (i.e. farmers markets and the UA project's site) acting as networking hubs and points of distribution, education, and raising local awareness, UA projects' social networks branch out to policy makers, local industry collaboration, and the larger food system suppliers as part of the sphere of influence for UA projects.

Projects vary in characteristics due to location, collaboration, engagement and mandate. This complexity is illustrative of the diverse range of purposes projects work towards, as noted from Interview and Survey respondents: 55% focused on social system change, 5% focused on monetary gain from healthy food provision, 25% focused on education and capacity development and 15% focused on community empowerment. This leads to a fragmented interaction amongst UA projects within low-income urban communities, limiting the impact potential UA projects have for overall system synergy in moving towards sustainability (Kuck 2012).

Despite this fragmentation, there is a strong-shared understanding of the interconnectivity between the social, environmental and economic spheres, indicated through 72% of correspondents indicating an understanding of systems thinking. As Ken Dunn illustrates: “what is exciting is expanding the people’s progressive realization that conventional thinking is just on the wrong track. From the most marginalized person in a neglected community to even people in safe departments and positions of authority this system cannot work anymore” (Dunn 2012).

All respondents commented on the growing momentum away from the Industrial food system. However, despite such opinions, this motivation this not the primary purpose of many of the UA projects interviewed. Rather, UA seems to be is a valuable tool to address many social, economic and environmental cleavages for the individuals within the community. In low-income urban areas especially, the prominence of drugs, violence and gang activity places many youth statistically as “dead, pregnant or in jail before they finish high school. If they do” (Brown 2012). Such statistics reduce confidence and potential, breeding sustained poverty rather than a healthy future.

Success. Our findings indicate the majority of UA projects are attempting to instate a change in society by engaging, educating and feeding the communities in which they were part of. They shared a strong vision of providing their community not only with a means of environmental sustainability, but a deeper means of attaining social sustainability. UA is seen as a vehicle that re-connects people to nature and to each other, while also “empowering them to take control of their health, their food system and their role as wider change agents in the world” (Washington 2012).

From our research, three primary goals emerged as overarching visions of

success from current UA projects: 1) 33% of respondents focused on provision of healthy and fresh food 2) 51% of UA projects focused on revitalizing neighbourhoods by providing alternatives to issues correlated with poverty. Examples of responses in this category referred to unemployment (30%), drug use and gang association (25%), beautification and use of abandoned lots (15%); and change of community image (12.5%) and 3) 16% of total respondents were focused on mitigating a lack of opportunity for local citizens.

Overall, the majority of respondents questioned about UA project's vision of success were answered with statements corresponding to the many benefits of UA projects, rather than specific statements or visions of success that the projects themselves had to work towards. Only 16% shared a mission or vision statement as to the mandate set out for the project. Although there is very little overarching vision of success many UA projects seems to be socially motivated rather than environmentally focused.

Strategic. Supporting the gap identified in Section 1.6.1, 28% of Interview and Survey respondents explicitly indicated they did not have a set strategy for moving towards success, with many projects taking the approach “we are just doing here what we do, and hope to God we will be here tomorrow” (Anonymous). Pressures of daily survival for juvenile projects outweigh the ability for long-term strategy to be produced. 29% alluded to a long term business plan, while the majority simply offered actions they are taking to overcome barriers in current practice. Importantly, no respondents offered explicit steps taken for fruition of a sustainable future.

Actions. Current actions projects are taking to reach the three primary goals surrounding their vision of success (as stated in *Success* above) include:

- *Education:* the creation of educational programs for collaboration, capacity development and information sharing (47%)
- *Community engagement:* using UA projects as a Third Space for strengthening community bonds and support (54%); hosting workshops such as ‘Seedy Saturdays’ (Satzewich 2012) and ‘neighbourhood days’ as an opportunity for local residents to meet on site (Carraway 2012); youth engagement activities and programs (41%).
- *Community empowerment:* employment of local community, including job training (71%) and inclusive community project design, articulated by the needs and continued support of the community (58%).

- *Promotion of local eating*: Encourage ‘Pick-your-Own’: neighbourhood picking of seasonal produce (Nuri 2012) and hosting community dinners on site (Washington 2012).

Tools. Instead of a distinct array of specific tools, they are independently being sourced for the task at hand. All respondents have utilized the internet as their ‘go-to’ source for information; 21% use it for practical horticultural issues and 38% use it for understanding national/municipal policy and legal information. Further, a need for assistance in developing strategic support and business models from larger UA projects, such as Growing Power, is sought predominantly online (33%).

38% of respondents state that UA itself is a “tool for providing inspiration and cohesion, hope and opportunity, resiliency and a sounding board for the opportunities that exist for a transformational change to a new sustainable paradigm” (Kuck 2012).

3.1.2 The FSSD: Informing the Ideal Project and Gap Analysis

In order to determine the gap, results organized in the 5LF were analysed against the Ideal Project organized within the FSSD:

Systems. Ideally, UA projects would understand their systematic connectivity within the greater food system, within society within the ecosphere. An understanding of this socio-ecological system necessitates a systems thinking perspective, acknowledging the many variables that can effect production, success and support a project. Knowledge of these various socio-ecological cycles and the relationship between UA actions and impacts on these cycles will provide UA projects and stakeholders with a better understanding of the system they are operating within. “[UA] is vitally important, and it is so basic, starting with national security, the economic impacts, the health impacts, the social benefit impacts, environmental impacts. There are so many big impacts involved with getting food right. People are waking up to this... and things are changing” (Lipbolt 2012).

The Gap: Current UA projects are generally aware of the complex system in which they operate. But this understanding needs to be strengthened in terms of how to navigate the sustainability challenge.

Success. In an Ideal Project, a shared vision of success would be created, aligned with the four Sustainability Principles.

When planning for a sustainable future, UA projects envision that they:

- “...Produce local food and [are not] being dependant on sourcing our material from all over the world. We can use local resources to build a local economy that is not volatile [to society]” (Dunn 2012).
- “Use food and other means to basically empower people of the neighbourhood to turn it into the kind of neighbourhood where no one would want to leave. So it has opportunity, community and people feel safe” (Katz 2012).
- UA projects envision that they “create, maintain, foster, fertilize, establish and support an environment where urban farmers could be developed...and find all of the infrastructure they would need to move forward in a sustainable way [of living]” (Toole 2012).

Additionally, UA projects also consider larger visions of socio-ecological success in relation to achieving benefits across environmental, social and economic realms simultaneously:

“...There is a [UA] project, installation, and program in every school. In every square city block there is a family business producing good, healthy food for their neighbors. There are innovation centers in each neighborhood and at least each city explores green technologies for food production, mobility, community scale manufacturing. With this, an explosion of cooperative enterprises starting with cafes, pubs, restaurants, artisanal workshops in neighborhoods making it vastly more self-reliant; with a focus on a culture of care while the culture of consumption is being composted and dusted into history” (Toole 2012).

The Gap: The current disparity between the current reality of UA projects, and those based in a sustainable future derive from an overall lack of vision; with fragmented definitions of UA itself and no shared definition of success. When asked what UA is, 48% of respondents stated different definitions, all of which were different from the UN definition outlined in section 1.4. This fact prevents UA projects from successfully producing a vision acknowledging the larger scale perspective of sustainability. In line with backcasting from a shared vision, one of the greatest needs for UA projects is to form a vision of success, starting with defining UA itself based upon the four Sustainability Principles.

Strategic. In order to help UA continue as an effective vehicle for social revitalization, planning, using strategic guidelines, to meet these needs is required. When asked what advice could be provided for future UA projects, 68% stated the Ideal Project involves increased collaboration and partnerships within the local socio-economic field. 75% deemed it mandatory that UA projects be a learning organization focused on accessing as many people with as much information as possible, “incorporating education to provide natural and tangible skills and knowledge, and also provide life coaching, spiritual guidance, life skills [for] how to deal with conflict in a successful way” (Robinson 2012) in order to foster a societal shift towards sustainability. 76% stated co-creating the project with the demands and needs of the community. Further, 62% of correspondents recommended an efficient and scalable business plan would be beneficial as a strategy in moving towards success, where financial sustainability is as important as a long term vision of success.

The Gap: The gap lies within a lack of strategy in planning. Most of our respondents have strategy based on “yearly, hard fought, incremental progress towards goals” (Anonymous Interviewee). Further, there is a lack of external support from regulatory bodies.

Actions & Tools. For the Ideal Project, a variety of tools would be utilized by UA projects to aid in implementing actions, monitoring growth and system impacts, such as “developing assessment system of skills and knowledge” (Blom 2012), as well as for understanding and operating within the complex system of the urban sphere. 65% of Interview respondents stated that ideally there would be an increased awareness and use of supportive networks and coalitions, including, but not limited to: ComFood, Sustainable Agriculture Research and Education Program, Advocates for UA and The UA Summit. Further, adoption of growing methods such as SPIN Farming (Satzewich 2012) and SquareFoot Farming (Ladner 2012) would be used for successful, profitable and sustainable practices.

The Gap: There are limited cross-collaboration platforms for projects to share information in terms of guidance, resources and advice on actions suitable to UA. The organic, localized, nature of UA projects make it easier to grow independently of one another creating challenges in adopting appropriate actions and tools for successful project implementation.

Table 3.1 The Current Reality, The Ideal Project and the Gap

Level	Current reality of UA projects: 5LF Analysis	Ideal Project through the lens of the FSSD	Gap(s) Identified
Systems	Complex interface between the urban sphere and agricultural food production. Despite the diversity of project purposes, there is a strong shared understanding of the interconnected economic, social and environmental benefits.	A deep understanding of systems thinking and an appreciation of the relationship between communities and their food system. There is focus on the socio-ecological interconnectivity.	Awareness of the complex relationships between communities and their food system. This needs to be strengthened in terms of how to navigate the sustainability challenge.
Success	Primary focus is on individual goals, rather than a specific vision. There are 3 primary goals: 1.Fresh food 2.Revitalize neighbourhoods 3.Community engagement	The vision of success aligned with the Sustainability Principles. - Empowerment of local community members through capacity development and local food production.	- Lack of strategic guidelines to guide long term planning and help prioritize actions.
Strategic	- 28% of respondents explicitly indicated they did not have a set strategy for moving towards success. -Actions are primarily reactionary rather than strategically planned.	- Backcasting from a vision of success, using the 3 prioritization questions as a minimum for project's strategic design. - Increased awareness and use of supportive networks/coalitions.	- Lack of strategy and long term planning to help prioritize actions.
Action	-A diverse array of actions are being utilized to reach the 3 primary goals above.	- Adoption of concrete strategic actions with a sustainable vision of success.	-Lack of recommended actions to take.
Tools	-All respondents utilize the internet, yet there was no emphasis on specific tools. It was mentioned UA itself was seen as a tool.	Increased awareness and use of supportive tools, networks and coalitions.	Limited collaborative platforms for projects to share information in terms of guidance and resources for effective actions to take and associated tools to use.

3.2 Leverage Points

To answer SRQ 2 Meadow's 12 Leverage Points theory was used as a subsidiary analytical tool, to determine where UA projects are currently acting to impact change within low-income urban communities. A summary of Leverage Points corresponding to where UA projects are focusing their attention to create change, can be viewed in Figure 3.1. The majority of the focus is on lower numbered Leverage Points identifying that UA projects have potential to create very impactful change. As these were previously discussed, please refer back to Methods, section 2.1.3, for a description of each Leverage Point.

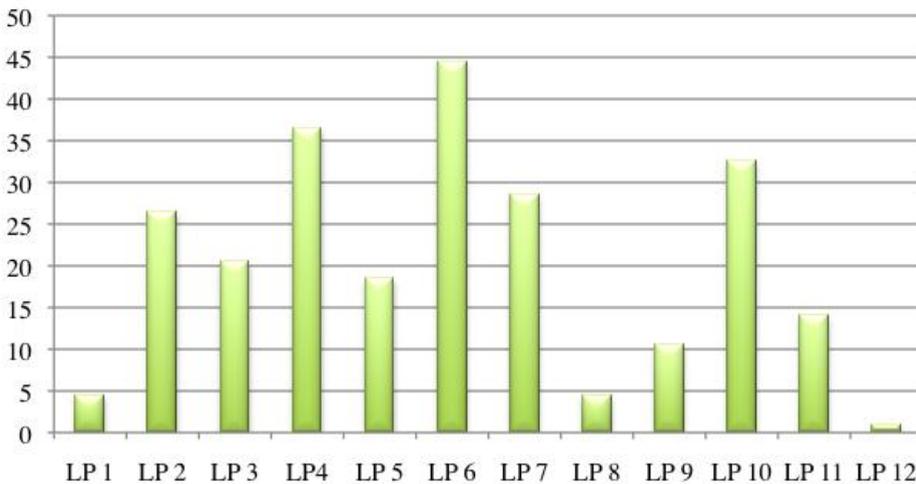


Figure 3.1 UA's Correspondence to Leverage Points

12. Changes in Constants, parameters, numbers. Results indicate that current UA projects in low-income urban communities face many bureaucratic barriers such as zoning bylaws and lack of subsidies, restricting projects growth potential (Rhodes 2012). 18% indicated a strong need for more acceptance and support through policy and subsidies for UA projects. 29% of respondents indicated that creating alliances with policy makers and governing bodies encouraged such developments, but overall UA projects are not facing many outside actions that would change the constants, parameters and numbers.

11. The size of buffers and other stabilizing stocks, relative to their flows. There are few actions being taken by UA projects that correspond to this Leverage Point despite 83% of projects interviewed and surveyed stating they are prone to shocks in production as a result of seasonality. 58% of projects interviewed stated they were in need of increased infrastructure in order to increase stock to meet demand throughout winter months, or to create sufficient supply to cover costs over the primary growing season. Buffers to limit the effect of shocks, such as the need for infrastructure, greenhouses, hoop houses, storage coolers, processing houses and access to kitchens is common to all respondents to maintain annual production capability. Moreover, projects are diversifying production to provide a variety of stabilizing stocks; 20% have recently included Aquaponics, in small, scalable projects to include diversity and to supply a 'harvest' 12 months of the year.

10. The structure of material stocks and flows. The UA projects interviewed operate on relatively small annual budgets, therefore the need to find value in accessible resources is paramount. Respondents indicated undertaking such actions as recycling found materials for building garden beds or turning waste into useable resources (29%), composting organic waste to create soil (58%) utilizing brownfield sites or vacant lots as a means for production (37%) and employing those viewed as unemployable (54%). These actions change the importation and utilization of materials within low income communities, reducing strain and congestion on city infrastructure, promoting a localized economy.

Additionally, 58% of those projects researched incorporate education and training programs to increase participation and understanding of UA, empowering intergenerational demographics to grow their own food. 33% of respondents indicated a greater need for weeklong and annual farmer market locations to supply their stock.

9. Change the length of delays, relative to rate of system change. Three primary areas of focus emerged in which UA projects are acting to mediate the length of delays. First, six of the 23 UA projects interviewed are involved in coalitions to apply pressure to policy makers, to educate them on the benefits of UA, and mitigate the time currently needed for legislative change. Second, four respondents reported attracting media exposure and networking through online platforms as progressive achievements in increased sales and participation in projects. The primary action to overcome such a barrier was through educational programs (75%) and open

door policy (46%) to showcase the healthful benefits and community environment created by UA. Third, access to resources, being land (21%), people (33%), infrastructure (37%) or funding (80%), was mentioned by almost every research participant as a delay to instigate change. 69% of respondents are creating coalitions with other UA projects, or partnerships with policy makers to expedite the length of delays. “We are pioneering this field, and people just don’t know what to do when you tell them you need a permit for a farm in the city” (Rhodes 2012). 50% of survey and interview respondents have had direct delay in operational momentum from legislative bureaucracy.

8. *Negative feedback loops.* No survey respondents or interviewees mentioned actions corresponding to negative feedback loops. The lack of strategic planning means many projects are taking a reactionary approach to their operations, without regard for long term sustainability. Actions such as co-creating the project with the community, producing a vision of success for strategic planning and provision of capacity development training programs can be used to foster negative feedback loops.

7. *Positive feedback loops.* “We just keep creating new community gardens, community farms, encourage new farmers markets, fruit trees, it’s all happening and more and more people are doing it. One of the next big steps forward is local procurement” (Ladner 2012).

Our research indicates the prominent approach of UA projects is to expand visibility and awareness through community engagement workshops, participatory community design and multiple forms of educational activities. For example, 67% of respondents use youth engagement and training programs, designed to build the capacity of youth, while also stimulating and educating the broader community on how to create their own UA project.

In low-income urban communities, the lack of opportunity, skill set and economic opportunity can keep these areas trapped within poverty cycles. 78% of projects researched indicated that the educational and participatory projects were not simply designed for a UA experience; the intention was to provide tangible life skills, increased entrepreneurial spirit, business management, interpersonal skills and personal capacity development in regard to confidence, future outlook and employability.

6. *Change the structure of information flows.* All respondents focus on education directed towards incorporating the needs of their surrounding community and empowering citizens to take action in the UA field. This reconnects them with where their food is from, while also offering them a means of developing personal capacity and interpersonal skills, with the overall objective focused on how “there is a whole lot of economic potential, and a whole bunch of ways to use space that people see as a problem and turn it into a productive space” (Katz 2012).

The Internet came up as a popular forum that poses potential for bridging information gaps. As previously noted, all interview and survey respondents used the internet as their ‘go-to’ source for information; 21% use it for horticultural advice; 38% use it for understanding national/municipal policy and legal information. Projects such as Britta Riley’s Window Farms are using the Internet as a tool for gaining support and crowd sourcing development initiatives (Windowfarms 2012); Sweetwater’s Aquapons for online certification¹¹; or Curtis Stones’ SPIN farming demonstration as an online how-to guide for growers¹².

Innovative practices for UA exposure are deemed invaluable by those interviewed in order to create change as “the more people practicing urban agriculture, the closer we get to making it a no-brainer, like recycling” (Blom 2012).

5. *The rules of the system (such as incentives, punishments and constraints).* 50% of project stated the need to sense the field; that is, working towards the needs of the community, determining the needs and the demands rather than imposing a prescribed action plan (Washington 2012; Dunn 2012; Blom 2012; Corby 2012). This includes; understanding policy, regulations and land tenure, as well as knowledge of the local economic structure and social welfare system in order to determine where

¹¹ An online competition aimed towards finding creative ways of using new media to support the cross collaboration and mobilization of education in aquaponics.

¹² A web based platform; social entrepreneur Curtis Stone invites the public to follow him on an interactive weekly video lesson on how to start their own urban farm (Gro Action 2012).

change is possible. Advocating for the benefits of UA to policy makers can streamline permit approval (Rhodes 2012), and break down barriers to zoning restrictions (Washington 2012). The relationships between the city and UA projects can be mutually beneficial; “when cities start looking at the economic benefits, UA will start to make more sense and cost less, with [the city] having to haul less to the dump as people compost more” (Dunn 2012).

4. The power to add, change, evolve, or self-organize system structure. All projects surveyed and interviewed indicated there was incredible change within their community once the UA project started. Changes included: increasing local business ventures (18%), physical revitalization of buildings and abandoned lots (42%), even eradication of gang prominence and open drug use (23%).

As UA projects gain strength and popularity, our respondents indicated a growing ability to apply for larger grants and advocate for additional policy changes with greater awareness by decision makers (Kuck 2012; Nuri 2012; Rhodes 2012; Robinson 2012).

Although there is a growing strength and recognition of the importance of UA, there are still barriers preventing UA from changing and self-organizing the system structure. The lack of education surrounding what food is, where food comes from and what to do once you have it reduces community support of growing food within the urban realm (Corby 2012).

3. Change the goal of the system. As previously mentioned, 72% of respondents refer to systems thinking; “we really see ourselves as a part of the whole, we don’t think we have a solution for everybody, we don’t think the successful vision of the future is that everybody has to be growing, but we want to make that as easy as possible if people do want to do that, inspire anybody to produce food at a healthy level, or take action to change how things are”(Lipboldt 2012). To do this, 54% of respondents focused on creating a Third Space, open to the community to produce dialogue for actions to strengthen the social fabric. Within this space, people are encouraged to “talk about what they want for change – and one of the things they started talking about was the food system” (Rhodes 2012). Alongside changing the goals of the system, goals of individuals are also being uplifted; “People recognizing there are other assets in the community which they never thought they could utilize to meet their own goals” (Kuck 2012). Allowing people to “feel proud of their success and [that they’re] a

valuable member of [their] community with all the respect and pride that comes with it... and as it turns out also be a part of sustaining the whole food system, sustainable transportation systems, just a sustainable system” (Dunn 2012).

2. Change the mind-set or paradigm out of which the system arises. Our research indicates that there is a desire to change society from “the inside out to make a difference” (Nuri 2012), providing an opportunity for individuals within their community system to create change independently. UA has the ability to provide therapeutic properties for self-healing, increasing self-worth and potential for a personal paradigm shift (Katz 2012). 37% respondents stated some of their participants had made remarks to feeling liberated from precursor stereotypes and statistical bondage of victimization from current system trends by being involved with the UA project. UA possess the ability to instil deeper level meaning into people; “It’s not just an industry, it’s a movement” (Blom 2012). 68 % of respondents stated the purpose of the project was to empower people through increasing individual capacity for future resiliency, alluding to transformational change of individuals and thus changing cultures of behaviour within a system.

1. The power to transcend paradigms. “Society is bankrupt and it is in steep decline, but it only has one problem, that it doesn’t know how to respect the emerging community; when we learn to do that, we solve every other problem” (Dunn 2012).

Of all the UA Projects questioned, 48% started projects because they were compelled by a need for change through a desire for a more fulfilling and inclusive sustainable society. They are motivated by “doing something you don’t have to ask why you do it, for the environment, for the community, all these good reasons” (Levenston 2012).

3.3 Enablers and Barriers

To answer SRQ 3, enablers and barriers were researched to determine factors affecting the success of UA projects so these factors could be taken into account when distilling Strategic Recommendations. Actions correlating to enablers were included in the final prioritization analysis, as were actions to overcome barriers. An example of this analysis can be seen

in Appendix F.

The results of the enablers and barriers analysed depict those with highest repetition from interview and survey results. Below, a summary of the enablers, barriers and actions to overcome those barriers are noted in Table 3.2 and Table 3.3.

Enablers. The personal capacity of project leaders with characteristics such as, dedication, passion, motivation, patience, listening and approachability was noted by 33% of respondents as a key enabler to success.

The need to formulate a strong and eclectic team from the onset of the project, expertise in soft skills (business management, teaching ability, policy advocates or volunteer coordination) and hard skills (construction, agrarian production and manual labour) was reported as a prominent enabler by 47% of our respondents.

37% referred to having the proper infrastructure such as sufficient coolers, storage, and processing arenas to ensure products were efficiently available for supply was a key enabler for them. 75% of respondents also mentioned an enabler as understanding, acknowledging and working with the local community to meet their needs.

Below is a table depicting the enablers of highest repetition from the results of our interviews and surveys. The benefits/outcomes outlined in the table are associated attributes UA projects reported as having been experienced by the enabler.

Table 3.2 UA Project Enablers of Success

Enabler	Rep.	Benefit/Outcome
Work with the Community	75%	-Strengthens the social fabric -Increases support from local stakeholders -Builds capacity of local individuals, strengthening community resiliency
A Strong & Diverse Team	47%	-Provides both soft and hard skills -A multidisciplinary approach -A solid core of effective reliance and knowledge for success
Proper Infrastructure	37%	- Efficient supply and production of product-maximizing profit and mitigating waste -Ability for seasonal growing and supply
Strong Interpersonal Skills	33%	-Fosters meaningful relationships with community -More responsive to individual needs -Nurtures volunteers' interpersonal skill development -Increases attraction to the project

Barriers. 40% of projects studied face barriers regarding policy and bureaucracy. 54% lacked any sort of guidance in ways to gain municipal support and navigate the slow and complex legalities involved with the physical infrastructure a UA project entails.

The ability to find time for production, operations, understanding of how to run an effective project and training was a barrier faced by 42% of respondents. Examples of such barriers are having a lack of time to keep up with daily tasks (21%), lack of strategic plans and models producing inefficiencies (33%), lack of knowledge in how to handle their communications (27%), sales (15%) or zoning bylaws (25%). Another key barrier for 80% of respondents was access to funding and uncertainty as to how to effectively make a living off their UA projects. 37% of the projects interviewed saw a need to adopt a 'not-for-profit' business model aiding their applicability for receiving grants and tax breaks.

Below is a table depicting the most common barriers that emerged from the results of interviews and surveys. The actions outlined in the table were noted by respondents as ways to overcome associated barriers.

Table 3.3 UA Project Barriers and Actions to Overcome them

Barrier	Rep.	Action to overcome Barrier
Funding	80%	<ul style="list-style-type: none"> -Use a Not-for-Profit business model to receive increased funding potential -Create coalitions to apply for larger grants -Diversify production: education classes, Aquaponics or Christmas tree sales all generate additional income -Employ SPIN farming methods to maximise yield -Sense the field and look at ways to use idle resources
Time	42%	<ul style="list-style-type: none"> -Start small in production size -Have a diverse range of skills and abilities on your team -Open doors to volunteers; include the community as much as possible -Do your homework- allow time for preparation, agriculture requires a lot of knowledge
Policy & Bureaucracy	40%	<ul style="list-style-type: none"> -Create alliances with policy makers -Educate officials as to benefits of UA -Maintain a visibly clean and subsequently reputable project -Create coalitions with other UA projects to streamline ordinances

3.4 Synthesis of Results: Answering the Primary Research Question

To answer the PRQ a list of recommendations was created from the answers to our SRQs, based on the gaps, actions being taken, and opportunities for action. The result was a list of 70 actions that UA projects could employ to support their movement towards success.

25 Strategic Recommendations. These 70 actions were put through a prioritization process outlined in section 2.3.3 under ‘Creation of Strategic Recommendations’. From this, 25 Strategic Recommendations (see Appendix I) were created, to strategically support a project in their movement towards an Ideal Project.

Foundational Values. These 25 actions were then analysed against the results of the SRQs. Those explicitly filling the gap or enabling success were carried forward to create a set of 10 Foundational Values listed in

Table 3.4. These values lay a foundation to build a vision of success upon. They are discussed in greater detail in section 4.4.2.

Table 3.4 Ten Foundational Values

 <p><i>Authentic leadership</i></p>	<p>Be true to yourself and promote transparency, motivation, passion, and patience within your being. A true leader is capable of listening, supporting, decision-making and attracting those around to participate. This is the starting point of success for a UA project. One needs to know the personal motives for undertaking such a project, letting go of pre-empted purpose, and focusing on nurturing the wants and needs of all those around.</p>
 <p><i>Knead the needs of your community</i></p>	<p>It is imperative that every UA project knows the needs of the community in which they wish to interact with. This is not simply what they believe the community needs, but what the community themselves have voiced. Our research brought up numerous stories highlighting ambitious, well intended UA projects that have gone into a field for all the right reasons but had none of the right outcomes.</p>
 <p><i>Let seeds grow</i></p>	<p>The pioneering spirit necessitated by UA projects requires the need for scalable approaches with small incremental advances as knowledge, resources, competence and community support strengthen. Plant your seeds as you can, once they grow, and grow well, plant more seeds and continue to spread from a small scale garden box, to a large scale production..</p>
 <p><i>Translate Value</i></p>	<p>Look for local resources that are lying idle or being considered as wastes that can mobilize to help your project. Many UA projects are powerful vehicles for engaging the unemployed, rehabilitating unused land and utilizing resources deemed as ‘wastes’. A primary example is in how urban areas produce a massive amount of organic waste, which can easily be diverted away from landfills for soil creation. Not only does this reduce environmental pressures, it can create a subsidiary business plan, providing resources of a UA project’s needs, but creates a profit from resale.</p>
 <p><i>Cultivate the community</i></p>	<p>The social system in low-income areas drastically limits the capacity or opportunity for community empowerment or engagement. UA, as a tool for transformational change within these areas provides opportunity, diversity support and hope for all in community, especially for youth. By providing training for life skills, internship opportunity, interpersonal skill building, increased hope and a movement away from degrading stereotypes, dynamic system changes are able to occur throughout the community.</p>

 <p><i>Pass it Forward</i></p>	<p>To make the UA movement sustainable, knowledge of entrepreneurial systems thinking must flow from practitioners to those participating in the day to day maintenance of the project. Ultimately, this approach creates inclusivity, responsibility and a shared ownership of the projects. This direction, along with its achievements, equip the next generation of UA projects with the skills they need to sustain and innovate the movement.</p>
 <p><i>Engage</i></p>	<p>The UA project should be more than just a means to produce fresh fruit and vegetables; growing good food should also be about growing good people. Use the project as a Third Space, to bring the community together, to work towards equipping the community with personal capacity, horticultural and business savvy skills, and to stimulate creative expression, dialog of local issues and co-learning. This can be encouraged further with the means of available access, equipment and events hosted by specialists.</p>
 <p><i>Plant the Roots of Sustainability</i></p>	<p>Develop the knowledge of what food is and where food comes from through interaction with planting, nurturing and eating of fruit and vegetables. Educational workshops in horticulture and on site interaction through gardening are means to ignite biophilia in project participants. This interaction aims to offer participants a new perspective to how they manage their approach to food and align dietary preferences with healthy, fresh and seasonal produce. A key learning for practitioners is to make the growing of food fun, creative and accessible; experiments with a diverse variety of crops can help promote the joy of horticulture offering a beneficial approach to sustain interest in younger participants throughout their life, to encourage a healthy and varied diet.</p>
 <p><i>Love it? Share it!</i></p>	<p>Advocate for the benefits of UA. There are countless positive ramifications from what UA can offer to people, the environment and a burgeoning new circular green economy. With increased dialog, through such things as educational workshops, media, exposure and collaborating with local municipal councils, mind-sets and regulation can be changed. If you find something positive coming from your UA project, share it with others. Talk to your friends, neighbours and community and tell them about it. Branch out to groups that may be heading certain fields and approach them with your findings. It is through actions like this that UA will gain understanding amongst popular culture and in turn gain access to such support mechanisms as UA friendly urban zoning permits, tax breaks and grants.</p>
 <p><i>Be local, buy local</i></p>	<p>If we ‘vote with our dollars’, ensure the project works with and supports local industries and businesses. Whether it’s where the project sources its materials from, the people the project interacts with or where waste is sent, it is important to keep in mind how UA can help stimulate a localized industry. The market will not only become more resilient to outside shocks, but will encourage positive spin off effects as local businesses and your community’s development</p>

3.5 Expert Feedback

The 25 Strategic Recommendations, 10 Foundational Values and a draft of the Executive Summary were sent to experts for feedback. The feedback was very positive, commending the recommendations as “some very viable action steps, completely real based on our experiences” (Corboy 2012), particularly those focused upon community relations; “You cannot do a project in a community without full community support” (Rhodes 2012). Recommendations for improvement on these deliverables included: reordering actions to capture the attention of any UA project, down to actions more applicable to business ventures; “most projects for low-income communities will be non-commercial UA projects planned to get people out of their apartments to plant a few seeds and get plants growing” (Levenston 2012), resulting in the need to expose “that there are two aspects of UA: the amateur, non-commercial and the experienced, more commercial growers of food in urban spheres” (Levenston 2012).

Rather than providing a static set of advice, it was recommended that projects will “want to be looking at which of [the 25 Strategic Recommendations] are absolutely necessary to [a project’s] success” (Ladner 2012)”. Moreover, a clearer explanation on how to translate these actions into support for the project was recommended by experts; as understanding “what that support is and how to get that support differs from city to city” (Rhodes 2012).

This feedback spurred the researchers to revise the static nature of the pre-described Strategic Recommendations with an implementation process in the form of the *Urban Cultivation Guidebook*. The 25 Strategic Recommendations have been reordered from those most accessible to any UA project, down to those more focused on business ventures; and placed at the Actions level of the Ideal Project. The 10 Foundational Values have been added to the Success level of the Ideal Project. To further engage the many social benefits of UA projects and to develop personal capacity and nurture community engagement, an additional set of prioritization questions, have been developed based on overarching themes synthesised from the results: educate, empower and engage . These are referred to as the 3 E’s, further elaborated in section 3.5.1. The 3 E’s have been added to the Strategic Level of the Ideal Project. In addition, to

operationalize the Ideal Project, a modified ABCD planning process has been suggested to move UA projects towards a sustainable and successful future. This process is outlined in section 3.5.1.

3.5.1 An Implementation Guide for the Ideal UA Project.

To bring an SSD approach to addressing the challenges and gaps UA projects are currently facing, the *Urban Cultivation Guidebook* was created as a guiding process.

In this section, a concise and abstracted version of the final Guidebook is represented, a more informed version can be seen in Appendix J, including the structure of the Ideal Project and steps of the ABCD planning process. The SSD approach which this Guidebook aligns with is outlined in section 1.3.2.

The Ideal Project. Outlined in its simplest form in section 2.1.1, the FSSD, the same structure is used for the informed Ideal UA Project. Inclusive, are the components of a Gap analysis, backcasting, the Sustainability Principles and the creation of a vision of success. Based upon the results of this study, additional components have been included for the Ideal UA Project, which entails:

Table 3.5 The Ideal Project

Systems	An understanding of the UA projects relationship with the community, the city, society and the ecosphere.
Success	A commonly shared vision of success is created, aligned with the Sustainability Principles. The 10 Foundational Values will be a reference point of success, which a UA project should adopt for a success.
Strategic	Backcasting is used as a methodology to strategically move towards a future vision of success. The 3 prioritization questions, along with the 3 E's are used as strategic planning guidance. Further, collaboration between different UA projects as well as the greater community is a primary strategy for increased success and community resiliency.
Actions	The 25 Strategic Recommendations are used as a Best Practice menu for UA projects. These are chosen, based upon contextual needs of UA projects.
Tools	<i>The Urban Cultivation Guidebook</i>

The ABCD Planning Process. To implement the Ideal Project, this process is intended to act as a guide and is to be iterative, building and adapting to meet changing conditions of the project's current reality. The steps include:

1° Explore: The External Understanding and Purpose. This step necessitates 'sensing the field' in order to reach success. This entails working with, and incorporating the needs/demands of a project's surrounding community. One such tool that may help guide this stage is Otto Scharmer's 'Theory-U', which manages change through showcasing leadership as a process of inner knowing, collaboration and social innovation (Scharmer 2009).

A: Creating a Vision. The Internal Understanding and Purpose. This entails co-creating a common purpose amongst those involved in the UA project, reflecting the collective vision of success. This vision should be aligned with the Sustainability Principles, and informed by the 10 Foundational Values as successful characteristics to base a vision upon; a strong point in the future to continuously work towards.

B: Baseline Analysis. A baseline assessment of the current reality of the UA project should be conducted, as well as the compliance to its new vision, in order to determine the gap. In doing so, some questions to keep in mind are: How is the project currently acting in regards to the Sustainability Principles? What are those activities which are in compliance with them and how can these be further developed? Does the project help empower local community members through capacity development and local food production? Based on the definition of success created in step A, what is the gap that exists?

C: Brainstorm Actions to Close the Gap. The 25 Strategic Recommendations, discussed in section 3.4, and viewed in Appendix I, can be utilized as a 'Best Practice' menu, in which applicable actions to the context of individual Projects within our scope can be chosen. These should also help guide and influence the creation of additional actions that may be relevant. These are recommendations of growth, and a starting point from which UA projects can choose from, but more importantly add to, in relation to meeting their own project needs.

D: Prioritization. In order to help UA projects choose actions most applicable and relevant from the list of actions brainstormed above, six prioritization questions, the three from the FSSD Strategic level and the 3

E's introduced below should be implemented. These questions are broad enough that they are applicable to each situation yet specific enough to help guide practitioners in the most strategic manner and should be used as a minimum. They are:

The 3 Prioritization Questions:

- 1. Will this action bring the project closer to its vision?*
- 2. Is this action a flexible platform?*
- 3. Will it generate a return on investment?* (which includes social, environmental and community as well as financial return on investment).

The 3 E's: To build upon this social focus of UA projects the following questions have been developed:

Does this action,

- 1. Educate...*
- 2. Empower... the local community?*
- 3. Engage...*

4 Discussion

This section will expand and reflect upon the results most relevant to our study. The discussion will be an interpretation of the results especially with regard to how the SRQs add up to answer the PRQ. First, we will discuss the SRQs, followed by the *Urban Cultivation Guidebook*, concluding with how this relates to answering the PRQ.

4.1 FSSD Analysis: The Relationship Between UA and Sustainability

The aim of this paper was to provide a SSD approach in order to support UA projects in low-income areas. To do this, we first conducted an FSSD analysis to measure UA projects in regards to their current SSD approach. This led to the development of a guidebook, which includes the necessary components to bridge the gap towards the Ideal Project.

The results illustrated a lack of a shared understanding of the Success, Strategic and Actions levels of the FSSD. This includes a lack of backcasting from a vision of success; a lack of strategic planning and largely reactionary actions.

Surpassing our assumptions, UA projects operating in low-income communities lack an explicit definition of sustainability yet showcase a tremendous understanding of systems thinking. Projects are able to connect the environmental, economic, and social systems together, allowing them to support one another. From this they are often able to see value in resources others deem as waste, utilizing them to grow both nourishing food and communities. Despite this understanding, the complex nature of the UA system makes defining UA itself incredibly challenging. Coming from a wide and versatile range of applications and purposes, there is no definition, no single typology, and definitely no single descriptive 'box' UA can be categorized within. This creates incredible challenges for the system of UA as a whole to define thus reach success.

Overall we have found UA to be an effective tool for social engagement. Despite the lack of a shared definition of sustainability, the diversity of UA projects and the efforts of individuals attempting to make a change are

collectively adding up to address our current sustainability challenge.

4.1.1 Creating a Vision for UA Projects

The majority of projects involved in this research share a common purpose: using their projects as a vehicle for (re)connecting people to land and to one another.

The diversity of projects has meant there is a lack of a shared vision within the field. The prevalent goals found throughout our study are: 1) Empowerment: focus on mitigating a lack of opportunity, 2) Education: reconnecting people to food, with tangible skill training, and 3) Engagement: through neighbourhood revitalization. Combined, these goals represent an overarching purpose many UA projects are working towards; representative of the many benefits UA projects offer to low-income communities in moving towards sustainability.

Based upon the research of this paper, the 10 Foundational Values represent the most common sustainable practices depicted by UA projects. For these values to lay a foundation for a vision of success, they should be held in the constraints of the Sustainability Principles, introduced in section 1.3.2. As the Sustainability Principles are general in description, ensuring applicability to a broad field of use, language more conducive to UA has been added to illustrate how they come into play for UA projects:

In a sustainable society a projects will not subject nature to the systematic increase of:

...concentrations of substances extracted from the Earth's crust
This is in regard to materials such as fossil fuels, used for transportation of produce and supplies or use of heavy metals for chemical inputs and fertilizers

...concentrations of substances produced by society
These are materials synthetic to nature, and persistent over time; for example, many herbicides and fungicides or chemicals for weatherproofing. These are synthetic, and do not decompose, polluting soil, waterways and the greater ecosphere.

...degradation by physical means

Monoculture activities that deplete soil degrade natural habitats and destroy biodiversity. Many human activities, such as paving over ground that would otherwise absorb and filter rain water and diverting it into storm drains that carry it out of the city challenge ecological cycles

...and in that society, people are not subject to conditions that systematically undermine their capacity to meet their needs

UA holds a natural ability to be a vehicle for social change. Moving away from the current reality low-income areas face; lacking community cohesion, opportunity and engagement, creating change for future generations to live a healthy and prosperous life.

When the 10 Foundational Values and the Sustainability Principles are combined they can help a project align a vision of success within a sustainable future. To ensure they are both understood and applicable by UA projects, the descriptive language of the 10 Foundational Values has been left general to meet the broad range of project purposes while tangible enough to still provide guidance for creative and inspirational growth towards a sustainable future.

4.1.2 Spreading the Vision: A Vehicle for Social Sustainability

The diversity of possible applications UA has for a societal shift towards sustainability is unique. The diverse range of UA typologies provides a platform for creativity to flourish. As a place of social capacity and skill development, UA projects foster the potential to create a strong social fabric and community resiliency. The authors found this to be a very important aspect across UA projects in low-income urban communities.

Projects do this by changing the value people see in themselves and in their community, acting as a vehicle for community change through which people can be (re)connected to nature; to their food and to each other.

4.1.3 Creating a Strategic Plan

The current reality of a UA project's approach is continually transforming in practice, purpose and direction as new challenges emerge. This type of 'ad hoc' strategy leads to limited cross-collaboration; for sharing of experiences, strategies and advice, resulting in UA projects "writing the book as they go" (Anonymous 2012).

The one strategy many projects share is a focus of instilling a participatory approach and listening to the needs of their community. "Talk to the community, know what they want, make it theirs. When you have a broad sense of collaboration you'll get your success" (Nuri 2012). Strengthening their ability to bring people together, beautify communities and connect local residents; meeting people on their front step, providing a voice, choice and opportunity to a large segment of society usually lacking support or recognition; opening a door for increased ability and empowerment.

The FSSD analysis highlighted the fragmented approach taken in UA projects, whereby a lack of long-term planning can result in reactions to daily challenges rather than long term strategic advances. This creates difficulty in planning and understanding how to best approach sustainable development within UA. *The Urban Cultivation Guidebook* offers strategic advice to help fill this gap. The Strategic Guidelines as well as the step by step ABCD process illustrate an applicable SSD approach for moving UA projects towards a sustainable future.

4.2 Determining Change in a Complex System

Meadow's 12 Leverage Points were used to understand where UA projects are acting to impact change. This was a strong analytical tool to supplement our research as it allowed for another means of understanding the vast and diverse current reality of UA projects. This analysis revealed where current attention is being placed and where strategic recommendations might be most effective at helping UA projects reach a sustainable means of success.

Many UA projects are already undertaking actions corresponding with lower Leverage Points. In general UA projects were very supportive of large scale system change when it comes to the relationship between food and individuals to each other. Extending beyond introducing people to food, but reconnecting them to nature and the experience of growing it, while also being a part of a community. It empowers people with a sense of

pride of themselves and strength in their ability to make a positive change in their communities. This corresponds to Leverage Point 3, which aims to change the goal of the system. Another example can be seen in how many of the projects attempted to change the structure of information flows by educating and engaging people from their local community to partake in UA. They did this through workshops, open-door policies and by acting as a Third Space; changing the structure of information flows and correlates with Leverage Point 6. Overall, the focus of UA projects was predominantly on fostering social cohesion and reconnecting people to the potential ability every individual has rather than competing with the overarching food system.

Interestingly, there was little attention focused on higher level leverage points, which could be due to projects young nature, diverse system goals, complex system parts and silo nature. We interpreted the lack of actions related to negative feedback loops as a potential opportunity for UA to draw attention to, for if projects continue to grow and develop without proper planning or strategic actions to keep momentum in check, their progression towards a sustainable future might not be as efficient, effective or long lasting.

Despite Meadow's prescription, that a greater effort is needed to create a large scale change through attention placed on lower Leverage Points, our research showcased how UA projects have unbound potential, and are already placing attention across these levers. We see this as a foundation for a system that aspires to be sustainable, showcasing the ability to continually evolve, working within complex system conditions. As the repercussions of the interconnected complexity of the sustainability challenge becomes more prevalent, we believe UA's adaptability and resilience will become invaluable in the future.

It is important to note, the authors have considered that Leverage Points are organic and relative to their surrounding system conditions. As such, our results should be perceived as applicable to the current reality of UA projects within our scope and purpose. These associations between project's actions and relative Leverage Points in which they relate to may change in the future. Our 25 Strategic Recommendations take this into account, providing recommendations which span the breadth of the 12 Leverage Points, producing an even pressure, thus greater potential for change across the complex system UA is part of.

4.3 Reflecting on Enablers and Barriers

To answer our SRQ3 a segment of our interview and survey questions were directed around discovering the most commonly acknowledged enablers and barriers UA projects have faced in the past, currently face, and expect to face in the future. This provided a detailed description of the current reality projects face; what works for UA projects, what is it they need and what hinders their success. From this, a comprehensive list of actions to move a project to success was put through a rigorous FSSD analysis aiding the production of the 25 Strategic Recommendations.

Enablers. Questions were asked of both internal and external enablers UA projects face. Although an incredibly comprehensive list of enablers came forth, the three most prevalent fell under a common theme of collaboration. 47% stated a strong and diverse team enabled their project in reaching their individual visions of success, while 75% stated working with the local community. Both of these hold a diverse range of possibilities, showcasing collaboration with outside organizations and groups as a versatile tool.

Upon further reflection, only 33% noted authentic leadership as a strong enabler, however this does not seem to adequately describe the overwhelming sense of necessity for this enabler. Every single interviewee depicted exceptional signs of authentic leadership through their dedication, passion, motivation, patience, ability to listen and approachability. This quality enables practitioners to gain support and subsequently navigate the complexity and independency projects face.

UA projects could meet needs of their local community both internally and externally. Internally, in regards to the project's purpose: almost all projects were adapting to meet a need of their surrounding community; in turn gaining community support in time, energy and capital. Externally, a greater promotion and acceptance of UA was voiced, fostering a deeper societal understanding, and larger shift towards sustainability. These aspects informed our strategic guidance for UA projects. The modified ABCD process entails a preliminary step, focused on sensing the field; collaborating with the community to determine what is best for the community. Collaboration and community engagement became a primary focus of the strategic recommendations due to the extensive benefits and advocacy potential attributed to it.

Barriers. When asked about the barriers affecting UA projects, we were

searching for challenges they have faced in the past and present as well as those they expect in the future. UA, as an emerging field, has incredible challenges with bureaucratic 'red tape' restricting acceptance or expansion. Access to funding is limited, due to seasonal variables and external factors. An interesting comment regarding funding as a key enabler revealed; "everybody needs money. That's a short and easy answer, but it is not the root of the real problem" (Anonymous). Other respondents indicated the problem really resided in their inability to find a strategy that allowed them to make sufficient profits independently. One could deduce this barrier is due to a project's inability to see value in resources deemed as 'wastes', as well as proper strategies.

There are few examples of strategic models of UA projects exemplifying good practice for other projects to work towards. Overcoming this challenge may solve the lack of time as a prominent barrier, alongside the aforementioned funding and policy challenges. This finding, in collaboration with the other results of this paper, was a motive behind the creation of the Guidebook; to provide an SSD approach to UA projects to reach success.

4.4 Reflection on the Guidebook

A prototype of the results, the 25 Strategic recommendations, Ideal Project and the 10 Foundational Values were sent to experts. It was asked if these would be helpful to them in reaching success. Their feedback was very clear; static Strategic Recommendations alone were not sufficient to cater for the diversity of projects as well as a broad range of contextual needs. Based upon this, and aligned with the gaps in Success and Strategic levels from the FSSD analysis, a guiding, step-by-step process was developed to provide the freedom for the project practitioners to navigate their own strategic process, allowing flexibility and dynamism.

The 3 E's emerged as common threads throughout the research process. The importance of education, to broaden the understanding of where food comes from, systems perspectives, sustainability and tangible capacity development was a strong component in which almost all UA projects employed. Empowerment of people to overcome the current reality facing many low-income urban areas is a cornerstone of focus for UA projects. Engagement is necessary for sustainability to be possible, as increased collaboration helps effect the many parts that make up the whole.

These 3 *E's*, independently, as well as collectively showcase the importance of collaboration. The majority of projects involved in this research share a common purpose; using the project as a vehicle for (re)connection; of people to their food and to each other. Primarily, this is in the form of community reconnection both internally to one's own capacity but also outwardly to the community. Moreover, collaboration allows the benefits of UA to be shared and sustainability to be inadvertently spread throughout the community.

Applicability to scope and the Sustainability Challenge. When approaching the scope for this paper, the authors were interested in where UA had the greatest potential for creating change towards a sustainable future. The dynamic nature of cities hold an incredible challenge for a guidebook to be created. As mentioned in section 1.3.3, cities are quintessential examples of a complex system. Further, providing guidance which is broad enough to match the vast diversity of the UA field was a challenge. How do we provide advice generic enough to span across the UA field and ever changing complexities of the urban sphere?

4.4.1 SSD Contributions from the Guidebook

The Guidebook has been created to be vast in applicability. The components are concrete in design, yet require UA projects to perform a self-analysis, supplemented by a step-by-step guiding process and a set of best practices to support any UA project. The intent of this Guidebook is to allow UA projects to create their own vision, thus path to sustainability using an SSD approach.

In fulfilling the gaps exposed though the FSSD analysis, combined with the comprehensive results from this research, the Guidebook contributes an SSD perspective by:

- Advocating for a systems thinking approach; offering examples and guidance as to the importance of systems thinking.
- The importance of a shared vision that aligns to the Sustainability Principles. In addition, the Foundational Values have been designed to offer guidance for the vision. These are designed to be broad enough that they are applicable to the full range of UA projects needs and contexts.

- Backcasting as a primary planning methodology along with Prioritization Questions, the three from the FSSD and the 3 E's, to strategically take steps towards success.
- It has become very clear that the diverse range of UA projects will necessitate individual actions and tools to be sourced to contextually specific needs. The 25 Strategic Recommendations (Appendix I) were deduced as actions of best practice, again, broad enough for practitioners to adopt those most suitable for their context. However, in order to ensure a strategic approach and strong decision capabilities to guide practitioners through an SSD approach and enable strong decision capabilities, practitioners are encouraged to brainstorm their own strategic actions for the contextual needs of the project.

In order to communicate the results of this paper and create a final deliverable tailored to low-income UA projects needs the ABCD process was utilized to structure the implementation of the deliverables according to the 5LF. An additional pre-step of 1 Exploration; involving sensing the field, which was flagged as essential for survey and interview respondents. The incorporation of this step ensures strategic support be applicable to the needs of the low-income community rather than pre-judged or overlooked.

The finalized Guidebook combines these deliverables and SSD approach in an accessible and visual guide that works to both inform and support practitioners of how to navigate the complexity of the sustainability challenge (See Appendix J).

In sum, to answer the PRQ, *How can UA projects be supported in a strategic way that enables a societal shift towards sustainability?*, the strategic support provided in this Guidebook is applicable to the complex system UA projects dwell within, it works to assist in navigating strategy in complex systems and works to bring sustainable benefits to the community at hand.

4.4.2 Research Strengths and Limitations

We had a very strong partnership with UA projects assisting our research. Our research was informed by 46 UA projects, from four countries across North America and Europe. The majority of our interviewees were either founders of their projects or had been involved from its onset. This personal

and in-depth understanding of their projects allowed for a rich information set. We were able to get a full understanding of all research questions and provided what we feel are accurate and helpful strategic recommendations in line with practitioner's needs of support.

Each one of the three team members brought forth different experience and skill sets pertaining to UA. Coupled with our diverse backgrounds, we were able to follow UA methodology of co-creation, producing a paper in concert with all of our voices and agreements.

Site visits enabled us to validate the practicalities of our deliverables. Further, the strength of relationships we created with experts in the UA field, producing a higher quality, personalized feedback was received.

Our biggest limitation was time. We had only a few weeks to analyse and interpret our findings into this paper. We would have preferred to engage with a broader range of UA project, to provide a bigger sample for our study. As well, we would have liked the ability to test our recommendations in the field, rather than simply obtaining advice from our experts as to their validity.

Our Survey questions may have been open to interpretation. Numerous questions posed a rating scale of 0-5, which held possibility of misinterpretation from our research respondents. Although the Survey was self-explanatory, 0 being negative impact and 5 being very positive impact, the 0 level could not be quantified as to how negative, resulting in a gap of information which had potential to change the outlook of our results.

4.5 Suggestions for Further Research

The authors make the following suggestions for further research:

How can collaboration instigate change within legislative and policy regulations impacting urban agriculture to foster a societal shift to sustainability ? Policy regulation and land law have proved to be consistent barriers to projects strategic planning, while collaboration with institutional decision makers has proven to be an enabler energizing UA growth potential. Research is needed to investigate the municipal governance of UA projects, asking questions such as; how can governing bodies be

educated towards the benefits of UA to inform policy decisions? How can land tenure and tax breaks be used for the benefit of UA practitioners? And, how can collaboration be formed between local government and project practitioners?

What business models and strategic templates can be used to up-scale UA projects drive towards success? Many projects are currently up-scaling and diversifying their practices, however there is a distinct lack of shared strategic knowledge to move projects towards sustainability, both between projects themselves and with regulators. How can this be done strategically in order to network between projects? How can projects embrace an entrepreneurial attitude and maintain financial sustainability? Is it possible to compete with the output of the industrial food system?

How can UA projects be supported in the developing world? Much research into UA practice is currently underway in the developed world. However as a mechanism to plan for food security, UA as a practice could be transplanted into the developing world to encourage a diverse diet, food security and social capital. This includes questions such as: Is there a need for UA projects in the developing world? What resources do practitioners need to strategically move towards sustainability? Could a similar strategic model be applied in both developed and developing nations?

5 Conclusion

The UA movement is currently gaining headway as viable solution in moving urban centres towards a more sustainable future. The path that lies ahead of UA is slowly opening up thanks to the pioneering drive of those currently operating in the field, including the experts we have researched for this paper. There is little regulatory support for UA to be adopted across all cities as an acceptable and socially just means of sustainable societal empowerment. The increasing adaptability and self-organization, as showcased through the lens of Leverage Points, is allowing UA to take innovative measures to overcome barriers affecting a sustainable future.

As unearthed from our research, UA projects do not sit idle awaiting a transformational change. They embrace the challenges, and opportunities that surround them, seeing value in the derelict reality that consumes so many low-income urban areas. We started this research with the impression that UA was a means to address the environmental impacts of the larger agricultural food system in which UA is a part. Our understanding has changed due to the motivating grassroots support UA is able to promote, allowing voice to each member of a community, exuding a sense of worthiness to those surrounding it.

In order to overcome the sustainability challenge, a similar mentality must be adopted by the larger society. Perceiving the value in that around oneself promotes a sense of fulfilment, allowing people to feel satisfied where they are and foster a motivation to create a change from the place they are in. That is what UA does. It meets individuals at their front steps, transforming the image of their home, in turn transforming the outside image of the community, in turn transforming the internal image of the community, in turn transforming oneself, allowing for transformational change to spill over into a larger, more affluent and resilient community.

The FSSD revealed that current UA projects are acting independently and are segregating the conglomerate benefits of UA by not holding a common vision of sustainability or vision of success. Through an SSD approach, we have provided Strategic Recommendations and 10 Foundational Values intended to support UA projects. To assimilate their unique and diverse benefits at a more rapid and successful rate, these deliverables are completely interconnected yet adaptable to fit the scope of individual projects.

We hope our recommendations, encouraging taking a participatory approach of SSD, will inspire current and future UA projects to develop their own strategic plan to mobilise communities towards a more resilient and sustainable future. Finally the authors hold great hope that along with these recommendations, the personal capacity and creative diversity of projects will provide the resiliency needed to move communities towards sustainability, so we can all live within the boundary of a healthy and socially just future.

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Appendix A: Interview Participants

Project	Contact	Location	Website
Added Value	Ian Marvey	Brooklyn, USA	www.added-value.org
City Farm	Ken Dunn	Chicago, USA	
Cultivate London	Geoff Gilbert	London, England	www.cultivatelondon.org
GoSo	Greg Brown	Chicago, USA	www.letsgho.org
Growing Gardens	Deb Lippoldt	Portland, USA	www.growing-gardens.org
Green Bronx Growing Machine	Steven Ritz	The Bronx, USA	
GreensGrow	Mary Seton Corby	Philadelphia, USA	www.greengrow.org
Growing Home	Harry Rhodes	Chicago, USA	www.growinghomeinc.org
Growing Power	Loretta May	Chicago, USA	www.growingpower.org
Just Food	Karen Washington	New York, USA	www.justfood.org
Our School at Blair Grocer	Jamie Katz	New Orleans, USA	http://schoolatblairgrocery.blogspot.se
Ohio City Farm	Amanda Dempsey	Cleveland, USA	www.ohiocityfarm.com
Preston's Paradise	Ryan Kuck	Philadelphia, USA	www.prestonsparadise.org
Project H.O.P.E – Riverfront Farm	Thom Caraway	Spokane, USA	www.projecthopespokane.org
S.A.V.E Farms	Christopher Toole	The Bronx, USA	www.savefarms.org
Southside Community Land Trust	Jessica Knapp	Rhode Island, USA	www.southsideclt.org
SPIN Farming	Wally Satzewich	Saskatoon, Canada	www.spinfarming.com
SweetWater Foundation	Jesse Bloom	Milwaukee, USA	http://sweetwaterfoundation.com
SweetWater Organics	James Godsil	Milwaukee, USA	http://sweetwater-organic.com
The Truly Living Well Center	Rashid Nuri	Atlanta, USA	www.trulylivingwell.com
Urban Tilth	Doria Robinson	Richmond, Cal. USA	www.urbantilth.org
Additional Professionals in the field (outside research scope)			
City Farmer	Michael Levenston	Vancouver, Canada	www.cityfarmer.org
MetFarms	Jon Aspeos	Amsterdam, NL	www.metfarm.com
TNS Vancouver.	Peter Ladner	Vancouver, Canada	

Author: *The Urban Food Revolution*

Appendix B: Interview Questions

System definition/Purpose/Success definition/Sustainability

1. What is UA to you?
2. What was the intended purpose of your project? Is there a need you are addressing?
3. Where do you see the project in the future? (Vision of success)
 - a) And what steps are you taking to get there?
4. Have you experienced any unexpected benefits (both *initial and unforeseen*) towards individuals or your surrounding community in which [project name] provided?
5. How do you see your project to be contributing to sustainability?
6. How do you feel urban agriculture has impacted the food system? (How has UA effected the social system)

Enablers/Barriers to your project:

7. From your experience, what have been the biggest barriers/[Challenges] effecting [project name] in the **past**?
 - a. And how have you overcome these?
8. What barriers do you face now? or issues you foresee being a challenge in the future?
 - a. Do you have a plan in approaching them?
9. In regards to specific factors that have helped [project name] along the way:
 - a. Have there been any factors within your project that have enabled your success?
 - b. Have there been any external factors (i.e. city council, bylaws, community support, other UA initiatives...)?
10. What resources does the project need to be a success?
11. What advice would you give someone starting an UA project as to the

- main barriers they should look out for, or ways around such challenges?
- a. Any useful resources or tools to recommend?

The Who:

12. Who benefits the most from your project?
 - a. Does seasonality affect those who benefit of the project, if so, how?
13. How has the participation in your project changed over time? [estimate numbers]
 - a. Employees? b. Voluntary?
14. Who keeps the project going?
15. When you compare the community prior to the project being established to the community now, how has the community changed?
 - a. What role does it play? (What is it that connects the project to the community?)
16. Do you feel there is a need for more collaboration between UA practitioners?
 - a. How would this be helpful to your project?
 - b. Do you feel there is a need for more UA projects?
17. From our understanding, your project incorporates educational workshops. What was your motivation in including these within your project's operations?
18. Do you have any other advice for current and prospective UA practitioners?

Appendix C: Survey Questions

1. How does your project define UA?
2. What is the purpose of the project? What is the need your project is addressing?
3. Please rank how the community has been affected by the project using the scale below. (Please tick/cross/highlight).
4. What is your project's definition of success? (What is the project working towards?)
 - a. Has your project accomplished this?
 - b. If so, please outline key steps the project has taken that enabled it to move closer to its vision of success :
5. What does your project need in order to achieve 'success'?
 - (i) short term: (ii) long term:
6. What relevant support does the project receive? Is the project reliant on any resources?
7. What are the biggest barriers impeding your success?
8. What is your strategy to overcome these barriers?
9. What has most helped your project? Please provide details if applicable:
 - (i) institutions? (ii) publications? (iii) online resources?(ii) a strategic strategy? (iv) human resources? (v) other, please comment:
10. On a scale of 1- 5 (1 being least important, 5 being most), how necessary are the following in supporting your project towards 'success'?

Networking	1	2	3	4	5
Marketing to customers	1	2	3	4	5
Encouraging local engagement	1	2	3	4	5
Practical farming advice	1	2	3	4	5
Legal support	1	2	3	4	5
Financial support	1	2	3	4	5
Strategic project planning	1	2	3	4	5
Resources to aid land access	1	2	3	4	5

Appendix D: The Colour Coding Key

Colour used for Coding	5LF/FSSD Level	Leverage Point
Red	System	1.The power to Transcend paradigms 2. Paradigm the system arises from
Yellow	Success	3.Change the Goal of the System 4. Power to change and self-organize
Blue	Strategy	5. Rules of the System 6. Flow of Information 7. Positive Feedback Loops
Green	Action	8. Negative Feedback Loops 9. Length of Delays 10. Structure of material stocks & flows
Purple	Tool	11. The sizes of buffers relative to flows 12. Constants, parameters & numbers
Additional Colour Coding		
Pink	Enables [E] and Barriers [B] Actions to overcome Barriers [A]	

Appendix E: Colour Coding Sample

resources, a place of connection, using food, to be a place to a grocery store which is a natural community connector, everyone goes to a grocery store at least once a week, usually more, so can that be a tool to actually let all these other people that work on drugs or violence use this hub to work on community development and a place to work on ppl and distribute their information and bring ppl together (10). I think that's my vision. I'd like to get away from food a bit (3) – and more towards how food is one tool for community development-(3). It's hard to form that UA can exist on its own, within tremendous subsidy unless you're going to high market consumers[B], highest market price. to me UA is a tool for achieving other social goals, and should be integrated into every social program, a place to start with healthy food and physical health- which allows us to engage in emotional community health[4/6,]- this idea that farming, we need farms to feed, never really resonated with me- the unnatural forcing of a square peg into a round hole....

Appendix F: Sample of Prioritization Matrix.

Themes	Leverage Points	Prioritization Questions			Prioritization Question Total
		RD	FP	RoI	
Resources					
seeing value					
turning Waste to resources	2,4,10,11	3	2	3	8
utilizing vacant land/brownfield	4,10	3	1	2	6
engaging unemploy(able)	2,4,6,7,8,11	3	3	3	9
Infrastructure - do your homework					
know proper equipment needs for your project (coolers, GH,HH)	11	3	1	3	7
be prepared for production, seasonality, transport and sale	4,6,10, 11	3	3	3	9
Soil					
have testing done	4,11	3	2	3	8
remediation	4,11	3	1	-3	1
composting - build your own soil	2,4,6,7,11, 9	3	3	3	9
Business/ Project Design					
<i>Start small and upscale</i>	4,6, 9, 10	3	3	3	9
Set goals/future plan					
know what your doing it for, know who your doing it for	2,3,4,6, 11	3	1	3	7
Create a vision of success	2,3, 9	3	3	3	9

Appendix G: Expert Panel

Name	Project	Website
Geoff Gilbert	Cultivate London	www.cultivatelondon.org
Harry Rhodes	Growing Home	www.growinghomeinc.org
Karen Washington	Just Food	www.justfood.org
Mary Seton Corboy	GreensGrow Farms	www.greensgrow.org
Michael Levenston	City Farmer	www.cityfarmer.org
Peter Ladner	TNS Vancouver. Author: The Urban Food Revolution	
Ryan Kuck	Preston's Paradise	www.prestonsparadise.org

Appendix H: Copenhagen Site Visits

Name	Industry	Contact
Byhøst	Mapping of locally grown edible food	www.byhoest.dk
GivRum	Regulators of empty lots and buildings	www.givrum.nu
Aquaponics	Aquaponics	www.aquaponics.nu
Sundholm Garden Project	Municipal UA project	www.kk.dk
Bybi	Supports vulnerable individuals by training them in urban bee keeping	www.bybi.dk
Prags Have	Community Garden	

Appendix I: 25 Strategic Recommendations

For all UA Projects

25 Strategic Recommendations	The Gap	Leverage	E	B	F
Resources	FSS D	Point	na bler	ar rier	V
<p>Recognize Value</p> <p>When working within low income areas, it is best to undertake low income approaches. Being able to see value in human and material sources allows for innovative design in monetary gain, sustainability alignment and community support (i.e. diverting organic waste from landfills, vacant land as profitable and unemployable as employable).</p>	Strat.	2,4,6, 7,8, 10,11	4	1	4
<p>Have proper infrastructure</p> <p>The need to plan for all aspects of product supply is integral to success. Establish a full time selling location (farmers market, pop-up food stand, food truck-hub) as well as plan for the infrastructure needed for seasonal growing and success- hoop-houses, greenhouses, storage coolers and food production- centers for keep fresh food stored out of the elements.</p>	Act.	4,6, 10,11	2	1, 2	3
<p>Build Your Own Soil – Compost</p> <p>Know your soil. Have it tested and continue to build soil through composting on an ongoing basis. Allocate a composting area for your project and advocate to the community to</p>	Act.	2,4,6, 9,11	2	3	4

<p>donate organic waste (i.e. landscapers/arborists that have organic material or school and hospital kitchens for food waste) to aid in building the fertile ground needed for agrarian success.</p>					
<p>Needs of Community</p>					
<p>Community Engagement</p> <p>Foster care and pride from your participants with the UA project. Employ local people. Ensure participants feel safe to voice their opinion in how the project is being run, so they are a stakeholder in operations.</p>	<p>Strat</p>	<p>2.3.4. 6.8.9.</p>	<p>4</p>	<p>2, 3</p>	<p>2 , 5 , 7 , 9</p>
<p>Co-Creation of the Project Purpose</p> <p>Encourage initial and continued input and collaboration between community members and the project' purpose so as to ensure the project is designed to meet the needs of the community, and not what the practitioner may believe they need.</p>	<p>Suc.</p>	<p>2,3,4 8,9</p>	<p>4</p>		
<p>Create a hub of activity</p> <p>Allow access to a third space for people to congregate. Create a hub of activity, promoting honesty, trust and support within the UA project. This should be a safe place, of calm, refuge, acceptance becoming a melting-pot of ideas and a space holding a great array of social resources</p>		<p>4,8, 10,11</p>	<p>4</p>		

Leadership					
<p>Nurture and Develop the Capacity of Others</p> <p>Believe in your participants and encourage their sense of self-worth in the world to make a positive change and create a community they can feel proud to represent. Allow them to develop entrepreneurial leadership skills through passing over roles of responsibility as skill levels permit, such as allowing students to go on to teach other students or manage sectors or sections of the project.</p>	Act	2,4,9	1,4	2	4,7,9
<p>Be an Authentic Leader</p> <p>Continuously strive to promote transparency, motivation, passion and patience in self. Work on such skills as presencing, appreciative inquiry, deep listening, non-violent communication, and suspending voices of judgement. Be grounded in actions, and inclusive in your presence – this will ease a social shift to sustainability.</p>	Suc.	1,4,10	1	2	1,6,7,9
Education and Awareness					
<p>Focus on Community</p> <p>The younger generations are the future leaders, invest in this populous to catalyse real change in cultural attitudes about the food system, how to grow your own as well as how to manage a project in a community setting. Workshops, school days and collaboration with youth projects offers a means to engage this generation with hands-on physical activity to strengthen the younger generations bond with the food system.</p>		2	4		

<p>Provide Training Programs</p> <p>For a strategic approach to success, UA projects should cultivate future leaders of change to pass the leadership of projects forward. By providing educational and capacity development training programs, in a vast array of topics, the resiliency of the project and community will flourish.</p>	Strat	6,7,8 9,11	1	3	7 , 6
<p>Advocate Sustainability – make the connection</p> <p>Knowledge of what food is and where it comes from can lead to an individual creating their own values around the food system. A means to action this is to engage participants in the nurturing, picking and consumption of produce on site.</p>	Strat	2,6,7, 11	4	1, 3	7 , 8
Policy and Advocacy					
<p>Be aware of policy and legislation</p> <p>Any project will be affected by local and federal governance and planning decisions. Know the institutions that may influence policy around land tenure, tax breaks, zoning, local pay and retail rights. Staying up to date with the policy decisions affecting the local climate and means to avoid certain restrictions may provide a strategic outlet to project development.</p>		4,5, 6,9	3	1, 2, 3	
<p>Establish Tenure</p> <p>Ensure that the UA project has access to land that is secured in a legally recognized agreement or purchased before establishing a project. Municipal land in need of redevelopment can be a potential access point for UA projects</p>		5,9 10,11	2	2	

looking for short to medium term land use, while friendly neighbours and community hubs (such as youth centers and churches) can be sources of land for medium to longer term contracts					
<p>Advocate the Benefits of UA</p> <p>Advocate for UA's economic (employment and job creation, stimulates localized economic activity, increases real estate value), social (increased social cohesion/healthy food availability while decreased obesity/crime), and environmental benefits (recycles local wastes into valuable resources, decreased carbon footprint of food consumed, reconnects people with nature).</p>	Act.	2,3,6 8,9	4	1	9
Local Economy					
<p>Working with farmers markets: create local food label</p> <p>Network with surrounding artisans and farmers to increase ease, awareness and availability of locally grown produce to be purchased through the establishment of a farmers market and the creation of such things as a localized food label.</p>	Strat.	3,4,6 7,10, 11	3, 4	1, 3	1 0
<p>Work with local people and industry</p> <p>Be local, buy local. Engage and incorporate people and industry from your surrounding community into your project whether through a volunteer or professional level. Network with surrounding industries so as to support your local market (restaurants, cafeterias, people, employment, youth).</p>		3,4,7 9,10, 11	4	1, 2, 3	
Business/ Project Design					

<p>Start Small and Upscale</p> <p>Create a small, sustainable project, with the ability for future growth. Holding confidence in ability, vision and knowhow. Begin to build that UA project within the boundaries of the community established within. For example, aquaponics only needs a few buckets, a bubbler and some fish- establish a clientele, amazing product and a good reputation, then invest in larger equipment and scalable advances.</p>	<p>Suc.</p>	<p>4,6,9 10</p>	<p>1, 2, 3</p>	<p>1, 2, 3</p>	<p>3</p>
<p>Create a Vision of Success</p> <p>Create a vision centered around knowing what you are doing, why you are doing it, who you are doing it for and where you want to be in the future. Planning for the future will allow flexible approached in attaining sustainable success socially, environmentally and economically. It is something to work towards, to revisit and be excited for.</p>	<p>Suc.</p>	<p>2,3,9</p>	<p>1, 4</p>	<p>2</p>	<p>3</p>
<p>Create a sustainable and diverse business model/plan</p> <p>Create a business plan based on models of successful UA projects (i.e. GrowingPower) and hybrid design (a mix of not for profit and for profit if possible). Create benchmarks and utilize your vision of success to create a more than 5 year plan. Think of seasonality, and diversify your production to include alternative activities (i.e. selling Christmas trees, snow removal, chopping and supplying wood) or ancillary ventures based on community need (i.e. bicycle repair, cooking classes, internship programs).</p>	<p>Suc.</p>	<p>4,5, 9,10</p>	<p>3</p>	<p>1, 2, 3</p>	<p>8</p>
<p>Uphold appearance and Reputation</p>		<p>2,7,9</p>	<p>4</p>	<p>1</p>	

<p>Success has a lot to do with reputation. And visibility. Locate in a space where you will gain attention from a broad audience. Keep a tidy site, beautify your space as well as the communities and create an image of caring, nurturing and authentic desire to make change. But, do not flaunt success or patronize the community with your wants and resources.</p>		10			
<p>Have a Good Team</p> <p>Form a trustworthy and reliable team inclusive of all the hard skills (construction, hardworking, soil science, horticulturalist, business management) and soft skills (social engagement, youth development, policy advocate) necessary for your business plan.</p>	Strat	4,6,9 10,11	3	1, 2, 3	3 , 7
<p>Create Partners</p> <p>Network and collaborate with other UA projects and the municipality to build a stronger partnership towards a strategic movement. Knowing the field's main players is key to developing strategic means of project success.</p>		4,6 9,10	3, 4	1, 2, 3	5 , 1 0
<p>Promote and engage local industry (i.e. farmers markets)</p> <p>Use the project as a platform to promote and engage local industry. Working with local farmers markets, restaurants and waste producers will enable new income streams and financial security. This is a means to network to build a profile with local stakeholders as to the social and economic benefits the project could create.</p>		4,6,7, 8,9,1 0 11	2, 4	1, 3	
<p>Know the Field</p> <p>Knowing the context of the community prior to</p>	Suc.	4,5,6 ,	3, 4	2	2 , 5

<p>offering a UA site to the local community is key to enable the 'buy in' factor of local residents of the project. Network amongst community members at local events and understand the local economic and social environment to create a project that gives to a specific need. This action is simple and very effective.</p>		9,11			, 7, 1 0
<p>Networking and Collaborating</p> <p>Expand the reach your project has by networking and collaborating with stakeholders and other practitioners beyond the city/state boundaries. A website provides an effective means to do this as well as a means to access news updates of other projects and regulatory frameworks.</p>	Strat.	2,3,6 , 9,11	1, 3, 4	1, 2, 3	2 , 5 , 7 , 1 0

Appendix J: The Urban Cultivation Guidebook

Due to limited space within this paper, and with not wanting to jeopardize the integrity of the guidebook, only a small sample is available. For a complete Urban Cultivation Guidebook, please visit:

http://issuu.com/urbancultivation/docs/the_urban_cultivation_guidebook

Urban Cultivation

A Guidebook to:



Educate.

Empower.

Engage.

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Guidebook Thumbnails: Support via Engagement

1 The Sustainability Challenge

Globally there are systemic increases in anthropogenic pressures on the earth's natural resources, challenging the ecosystem's carrying capacity due to a greater rate of consumption than replenishment. Such pressures are directly contributing to issues as climate change, economic instability, biodiversity loss, ecological degradation and environmental pollution¹. The future effects of such issues are largely unknown, as are the consequences to the earth's carrying capacity that will affect the very system humanity relies upon for survival. The deteriorating capacity of the ecological system's ability to support humanity's increasing demands can be depicted through the visual metaphor of a funnel, as seen in Figure 1.

The narrowing of the funnel walls reflects current sustainability problems are due to systemic errors in societal design and the weakening ability of the socio-ecological fabric to support our current societal means of living².



New practices need to be designed with a sustainable future in mind, allowing natural systems to return to a state of equilibrium. Sustainable development, defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" holds such potential. More so when constrained within the limits of the Sustainability Principles³. These principles state that in a sustainable society, nature is not subject to systematically increasing:

- 1...concentrations of substances extracted from the Earth's crust;
- 2...concentrations of substances produced by society;
- 3...degradation by physical means; and in that society
- 4...people are not subject to conditions that systematically undermine their capacity to meet their needs.

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3 Population & Urbanization

Pressure of the sustainability challenge is driven by the demands of an increasing world population; a trend occurring with the most prevalence in urban areas.

Populations are predicted to rise from 7 billion to approximately 9.2 billion in 2050⁴. By then, 70 – 80% of the global population will live in urban centres⁵.



This forecasted growth would entail a need to produce more food worldwide over the next 50 years than has been produced over the past 10,000 years combined⁶. To meet this demand, an additional landmass the size of Brazil will be required to adequately feed the global population by the year 2050⁷.

Is Localization the Answer?

The localization of food production is a means to create local food security, reconnecting people to their food, promoting food accessibility, nutrition and cultural preference.

Within the urban sphere, low-income communities can be particularly sensitive to challenges instilled from the current food system. These communities are prone to an increasing phenomenon known as food deserts; isolated areas lacking accessible and affordable fresh, unprocessed, nutritious food⁸.

5 Benefits of Urban Agriculture



UA projects offer many intimately linked environmental, social and economic benefits, providing solutions for tackling the intimately linked concerns that make up the complex system of urban areas⁹. From this, there is an increasing understanding of the value UA projects have as a powerful vehicles for urban areas to address the sustainability challenge. Some of the benefits include:

ENVIRONMENTAL



- Beautifies, cools climate & filters air pollution (Mougeot 2005).
- Means of environmental education (Smith 2008).
- Fosters an ecological habitat for inner city flora, fauna & wildlife (Bellefleur 2003).
- Recycles Waste (Dunn 2012)
- Reduces energy consumption, with decreased food miles (Broadway 2009).
- Revitalization of brownfield sites contribute to storm water retention (Schabell et al. 2009).



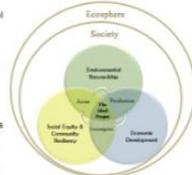
SOCIAL

- Reconnects people with nature, offering accessible & affordable food while fostering an understanding of a healthy diet (Bellefleur 2003).
- Localization increases their food security (Mougeot 2005).
- Supports community building (Coleman & Oates 2001)
- Increases an understanding of the processes affecting our food system (Birnaka and Samways 2010).
- Decreasing crime, trash dumping, juvenile delinquency and drug and alcohol abuse (Bellefleur 2003).

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6 Systems Thinking

Systems Thinking entails that individual properties can only be understood through the dynamics of the whole, producing a better understanding of the roles each part plays and how they interact with each other within the larger system of the biosphere¹⁰. It acknowledges the need to unite the aspirations and actions of those interacting within complex systems and the sustainability challenge¹¹. This basis of understanding and acknowledgment allows a holistic approach, fundamental when planning or restructuring, an integral part of sustainable development.



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Strategic Sustainable Development (SSD) is a methodological approach that drives sustainable practice and awareness. There are two key components of the SSD approach. The initial component is to define a vision to work towards; this vision must be shared for its full benefit to be communicated and achieved. This vision should be constrained within the scientifically deduced Sustainability Principles. These principles act as boundaries for a future vision of the organization to be designed within, they are general in order to ensure applicability and designed to inspire and guide creative actions within the capacity of the socio-ecological system¹².

Guidebook Thumbnails: Support via Guidance

7 Creating the Ideal Project. The process and the plan

So, now you know some background to sustainability, and the benefits of UA, so how do you make a successful UA project? The next few pages outline a process in which you can follow. A conceptual framework to organize and strategically plan towards success, creating your own Ideal Project, as well as a process to guide you step by step along the way.

The FSSD The Framework for Strategic Sustainable Development (FSSD) is a conceptual framework, allowing a simplified understanding of the many elements that make up a UA project. Information is structured into the respective five levels (which you can adapt to meet your own dreams tool). This framework aids in analysis of complex systems, decision making and planning towards sustainability.

The ABCD is a planning process, incorporating all the SSD concepts, holding the ability to actualize the Ideal Project in the FSSD. For the case of UA, a preliminary '1° Explore' step has been added. This places emphasis on incorporating the community and setting the field in which the UA project will be involved in. The process is outlined step by step below.

Systems	Adopting a systems thinking perspective to understanding the UA projects relationship with the community, to the city, to society to the ecosphere.
1°	A commonly shared vision of success is created, aligned with the Sustainability Principles. The 10 Foundational Values will be a reference point of success, in which a UA project should adopt for a success and sustainable future.
Success	
A&B	Backcasting is used as a methodology to strategically move towards a future vision of success. The 3 prioritization questions, along with the 3 E's are used as strategic planning guidance. Further, collaboration between different UA projects as well as the greater community is a primary strategy for increased success and community resiliency.
D	
Actions	The 25 Strategic Recommendations are used as a Best Practice menu for UA projects. These are chosen, based upon contextual needs of UA projects as a starting point, with additional actions brainstormed to match individual needs.
C	
Tools	Amongst other sustainable mobilizers, <i>The Urban Cultivation Guidebook</i>

The FSSD – A Conceptual Framework for Strategic Planning

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A&B Success: Creating a Vision

Yes! We all want to achieve success, but what does this mean?!

Success is based upon **defining an overall goal or 'vision'**. This is an understanding of the desired future projects and practitioners want to be working towards, through a shared purpose and value. This is the foundation of any planning process thus necessary prior to any strategic action being implemented¹².

Vision provides guidance about what care to preserve and what future to stimulate progress towards

Values
Your internal guiding principles, regardless of external reality.

- Would you still hold regardless if it became a competitive disadvantage?
- Hope your children will hold
- Remain regardless of your industry

Purpose
Your reason for being; what makes work meaningful.

- Ask yourself "why" you do something 5 times to get to this

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1° ABCD: The Process

To implement the Ideal Project: A modified ABCD planning process¹³ has been created to best suit the needs of UA projects within our scope. It is intended to act as a guide and is to be iterative, building and adapting to meet changing conditions of the project's current reality. The steps include:

1° Explore: The External Understanding and purpose
This step necessitates 'sensing the field' in order to reach success. This entails working with, and incorporating the needs/demands of a project's surrounding community. It is incredibly important to be aware of what the community wants, demands and needs, and the relationship between those aspects. As a UA practitioner, you must know what the surroundings of the projects will be, who is involved, and if it is wanted in the area, or acting to aid the area, without being simply self-fulfilling. One such tool that may help guide this stage is Otto Scharmer's Theory-U¹⁴, which manages change through showcasing leadership as a process of inner knowing, collaboration and social innovation

A: Creating a Vision. The Internal Understanding and Purpose.
This entails co-creating a common purpose amongst those involved in the UA project, reflecting the collective vision of success. This vision should be aligned with the

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D Set a Strategy: Backcasting from Success

The Strategy Level places emphasis on backcasting from Success. By envisioning your Purpose in the future then determining your current reality, a plan can be formulated to move towards that purpose by asking 'what do we need to do to get from here to there?' As a starting point, 3 Prioritization Questions (3PQ)¹⁵ help create a strategic plan for a project to formulate stepping stones towards success. In the case of UA projects in low-income areas, an additional 3 Prioritization Questions, the 3E's, have been created.

3 Prioritization Questions

1. Is this an action a step in the right direction? (Towards the vision of success)
2. Is this a flexible platform?
3. Will there be a good Return on investment? This is not just economic; the investment in community capital and environmental returns is also considered

Does this action:

1. Educate...
2. Empower... the needs of the local Community?
3. Engage...

3 E's

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