Urban agriculture: Carving a Space for Agriculture in an Urbanized World

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Program 2014

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Abstract

The dominant planning discourse tends to construct ‘urban’ and ‘agriculture’ as antonyms. However, with rising urbanization rates creating global challenges for meeting the nutritional need of urbanites, preserving arable land from urban expansion, and creating sustainable cities ensuring population and environmental health such a dichotomous way of thinking can be problematic. Globally, the phenomenon of urban agriculture is not new having always existed in various forms and serving diverse functions. For decades literature has examined its presence within cities of low-income developing nations with more recent literature discussing the emergence of UA within cities of affluent developed countries. The abundance of literature exploring UA provides an excellent foundation for a cross-cultural evaluation of its practices, allowing for a clearer understanding of its numerous forms and roles within distinct urban landscapes.

Urban agriculture has been championed as a food security measure increasing the availability of, and access to, fresh nutritious foods within urban environments. The following report evaluates intra-urban agriculture within both developing and developed cities. The evaluation provides a discussion on its social, economic, and environmental benefits and risks. The report seeks to determine if and to what extent intra-urban agriculture contributes to food security within developing and developed cities. To assist in this evaluation, two case studies examining urban agriculture practices within Toronto, Canada and Kampala, Uganda will be presented. Through the examination of UA’s relationship to urban food security this report attempts to illustrate why it is beneficial for contemporary urban planners to broaden their understanding of the ‘urban’ to include the seemingly rural activity of food cultivation, as well as provide recommendations for how such policy objectives can be achieved. It is imperative for urban planners and policy makers to understand urban agricultures characteristics, benefits, and risks as this understanding will allow for an educated discussion on UA’s present and future role within modern cities.

Acknowledgements

This project was successful thanks to the amazing support and assistance of many people.

I would first like to thank my supervisors Professor Richard Shearmur and Professor Jane Glenn. Thank you for your guidance and insight, affording me the ability to view this research topic from various perspectives. Your input along the way was invaluable to my research, as well as academic growth.

I am thankful to all those I interviewed for providing me with their time and interest. The interview responses greatly assisted my research findings and contributed to furthering my understanding of urban agricultural practices within the municipality of Toronto.

To the McGill Urban Planning staff, you have made the fourth floor a second home. Thank you for sharing your expertise and motivating us to always achieve more. To all my friends and classmates, especially James Di Paolo, and Kim Fils- Amié, thank you for your support and providing much needed reprieves from long days of studio and studies.

Lastly, but far from least, thank you to my family I am so grateful to have you in my corner providing infinite support. Mom, Dad, Grandma, Nonna, Emilio, Saddy, and David thank you for everything you have done for me over the years, all that I have accomplished is because of your endless love and generosity.

Part 1

1.1. Introduction:

> In the city where the colours run dry
> Or in the country where the colour green is applied
> In the city where there are polluting cars
> Or in the country where you can see the stars
> In the city there are gangs, all full of violence
> Or in the country where there is only silence
> In the city where the air, it's so thick
> Or in the country where you don't feel sick
> In the city where you seal the deal
> Or in the country where it is a place to heal
> In the city every corner is a fight
> But in the city the romance is in the moonlight (Buckland, 2010)

A city[1] is a complex organism in constant motion. Its characteristics, function, and design are often described in opposition to those of the country or the rural. The above poem's description of the city as a place of 'violence' and 'pollution' compared to the peacefulness of the countryside is one which we have all become familiar. The irony of this interpretation is that throughout history cities were often centres of freedom and safety to which people fled in times of war for protection. The origins of cities are rooted in thousands of years of history characterized by their political, economic, and social functions (Mumford, 1961). The urban is generally understood as fundamentally different from rural with little to no similarities or overlap. This dichotomous way of thinking tends to dominate modern planning and urban design consequently placing the terms 'urban' and 'agriculture' as antonyms.

Currently the planet is home to 6.3 billion people with the population expected to rise to 9 billion by the year 2050 (Viljoen, 2008, p.33). Humans are now formally an urban species with more living in urban areas than rural. As of the year 2007, half of the world's population resided in cities with this figure expected to grow to two-thirds by the year 2030 (Orsini, Kahane, Nono-Womdim & Gianquinto, 2013; Viljeon, 2008). Urbanization presents global challenges for meeting the nutritional needs of urbanites, protecting arable land from urban expansion, and creating sustainable cities that promote population and environmental health.

[1] A 'city' or urban centre refers to a relatively densely populated human settlement providing diverse employment opportunities, shelter, and services. Cities are epicenters of culture, education and technological development and are industrial hubs for processing, manufacturing, and income generation (United Nations, 2013).

The term urbanization generally refers to urban areas growing populations leading to the physical expansion of cities. Increasing levels of urbanization are caused by natural urban population growth, rural to urban migration, as well as immigration from developing countries rural areas to developed countries urban centres (Bhatt & Kongshug, 2005; UN, 2013). Although overlap exists motivations behind such movements vary between geographic locations. In North America and Europe, rural to urban migration has been spurred by opportunities and services offered in urban settings such as: employment and education, shrinking rural opportunities, land degradation, and loss of arable land (UN, 2013). In developing parts of the world, namely Africa, motivations include: poverty, civil unrest, real or perceived urban opportunities, exhaustion of natural resources, and land degradation (Bhatt & Kongshaug, 2005; UN, 2013). The process of urbanization has increased over the past half century and has led to the current population's concentration shift from rural to urban environments (UN, 2013).

Though not a new phenomenon, within these growing cities urban agriculture (UA) has re-emerged in developed nations as a popular urban activity and maintained its importance as a survival strategy amongst populations of developing countries. Although some motivations for participation differ geographically UA has been identified as contributing to economic, social, and environmental improvements at both the individual and community level. The lack of comprehensive urban and land-use planning within many developing cities provides the opportunity for the cultivation of unused urban land. Similarly, the post-industrial landscape of many developed cities, characterized by vacant and unused lots, offers the opportunity for cultivation.

The degree and intensity of UA varies considerably and is dependent on a myriad of factors including: geographical location, level of local economic development, local agricultural traditions, local government and planning policies, etc. (Bhatt & Kongshaug, 2005). Although these variations make it difficult to produce one universal definition of UA, it can be defined generally as:

> "… an industry located within, or on the fringe of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, re- (using) largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area" (Cabannes, 2012, p. 3).

Presently, approximately 100-200 million urban farmers[2] worldwide provide city markets with fresh agricultural produce (Orsini, et al. 2013). However, many municipalities still lack formal recognition of urban agriculture resulting in the absence of regulations and the marginalization of its practices. Urban planning as a profession has the capacity to promote favorable urban agricultural policies through zoning and ordinances; however, the dominant discourse in the field dictates that urban centres should be devoid of agricultural practices. This perpetuates the belief that urban food supplies should originate from distant rural places pre- packaged, ignoring the possibility for sustainable local food systems (de la Salle & Holland, 2010).

Urban agriculture has always existed, albeit in various forms and degrees (vanVeenhuizen, 2006). The stark position put forth by de la Salle & Holland's (2010) overlooks this fact detracting attention from the real issue; being, the limited official recognition and integration of UA within urban formal economies, planning documents, and policies (vanVeenhuizen, 2006). Over the past twenty years, much research examining UAs implications for urban food security, sustainable development, poverty reduction, and urban ecology have been conducted with respect to both developing and developed countries. The following report presents and analyzes these findings in order to determine the benefits and risks associated with policy makers and planners formally recognizing UA within official land use plans and policies.

[2] The term 'urban farmers' can imply an occupational group, however, in this report it is used to describe all individuals who farm within cities, but may not constitute an occupation group. Many people who participate in UA are not farmers by occupation but do so as supplemental to other activities.

1.2. Objectives:

Urban agriculture has been identified as an important component for the future design of sustainable and equitable cities within both developing and developed countries. Through a critical examination of UA's multifaceted nature and characteristics this report discusses how UA practices can translate into social, economic, and environmental benefits within contemporary urban landscapes.

A large body of literature examining the manifestation of urban agriculture within developing nations has long dominated academic discussions on its presence and practices. This literature discusses UA within the context of rapid urbanization, limited access to resources, environmental degradation, and civil unrest. Recently, literature examining UA within the context of developed nation's post-industrial landscapes has emerged and evaluates UA in relation to rising unemployment, urban poor's limited access to nutritious fresh foods, political activism, environmental activism, and community rebuilding. The abundance of literature exploring UA practices within developing and developed cities provides an excellent foundation for a cross evaluation of practices and facilitates the understanding of its role within diverse urban landscapes.

The following report will evaluate intra-urban agriculture within both developing and developed urban landscapes with a discussion related to its social, economic, and environmental benefits and risks. Special attention will be paid to intra- UA practices and forms which serve to promote urban food-security. Close examinations of intra- urban agricultural practices and policies will be explored through the analysis of two case studies. These case studies provide context to assist in explaining why it may be beneficial for contemporary urban planners to broaden their understanding of the 'urban' to include the seemingly rural activity of food cultivation and describe how such policy objectives can be achieved.

Urban agriculture has been championed as mechanism for food justice. As such, urban agriculture is upheld as a necessary component of equitable societies enabling equal access to safe, nutritious, and culturally appropriate food among urban populations (Hall, 2011). Thus activists, participants, and supporters of UA stress its ability to enhance urban food security

especially for low-income populations and communities faced with reduced access[3] to nutrient rich foods (Hall, 2011).The purpose of this report is to analyze these claims and examine UA's relationship to food-security to determine if, and to what extent, intra-urban agricultural practices contribute to food-security and poverty alleviation among urban residents of developing and developed countries.

The following questions will be addressed to assist in answering this query: What are the economic, social and environmental benefits and risks of urban agriculture? What motivates urbanites of both developing and developed countries to participate in urban agriculture? How are these motivations similar? How are these motivations different? What is food insecurity? What does UA provide and to whom? And how can policy makers and planners successfully integrate existing and future UA activities within community and land-use plans? Answering these questions will provide the necessary foundation for a deeper exploration of UA and its ability to supplement global urban food supply chains; as well as determine its place within land-use policy and plans.

1.3. Methodology:

The following four methods were used to respond to the above research questions: literature review, interviews, two case studies, and a compilation of recommendations.

Literature Review:

The literature review summarizes academic and gray sources discussing urban agriculture within developed and developing nations. The review was conducted to fully address the following research questions: How does UA contribute to food-security and poverty alleviation? What are the economic, social, and environmental benefits of urban agriculture? What motivates urbanites to participate in urban agriculture? What does UA provide and to whom? And how can policy makers and planners successfully integrate UA within community and land-use plans?

Through a comprehensive examination of the available literature, the review presents a portrait of UA's history, benefits, risks, and relationship to urban food security. The review was conducted using McGill's extensive library databases and campus library resources, as well as

[3] Reduced access stems from various social and economic factors which differ between urban communities of developed and developing countries and will be discussed when addressing the research questions.

non-academic media outlets such as news articles, TedTalk's, and blogs. In order to satisfy the reports objectives, emphasis was placed on literature profiling North American and African cities. This focus highlighted UA's similarities and differences within the context of developed and developing cities. This cross-cultural examination was necessary to determine UA's importance to urban food security globally. The analysis of UA practices, benefits, and risks within diverse geographic locations provide a well-rounded discussion on how UA practices can be integrated into municipal policy and planning documents and also why many municipalities still hesitate to formally recognize such practices.

When approaching literature on UA it becomes apparent that an overwhelming amount of research has focused on its presence within low-income developing countries. Although this was useful for discussions on UA within the context of developing cities it proved limiting for fruitful discussions examining UA within developed cities. Furthermore, literature which does explore UA's presence within affluent developed cities tends to be narrowly confined within the discussion of advocacy attitudes which at times proved to be uncritical. To overcome these limitations I broadened my literature search to incorporate interdisciplinary views such as social geography, sociology, race theory etc. By doing this, I was able to uncover more critical explorations of UA and the Alternative Food Movement within affluent developed nations.

The following three methods were used to further answer the above stated research questions and to broaden the understanding of UA's benefits, risks, motivations, and impact on urban food security within North America and Africa.

Interviews:

Phone interviews were conducted with individuals involved in urban agriculture practice and/or policy formulation within the city of Toronto and Ontario more largely. Once identified potential participants were recruited through email. The recruitment email provided detailed project information outlining the reports scope and methods, requesting their involvement as key informants. After consent was gained via email phone interviews were arranged. The interviews proved useful for identifying: current UA practices, participant motivations, benefits and risks of practices, barriers to UA's growth, as well as existing municipal support and support gaps within Toronto.

To establish a full understanding of UA within Toronto I intended to interview a variety of individuals from different organizations as well as city officials. Despite limitations I was able to interview 7 participants (Appendix 1). The participants included: municipal and provincial associates, university instructor/ freelance researchers, members of a Toronto-based UA companies, and individuals from various non-profit urban agriculture organizations stationed throughout Toronto. Due to confidentiality agreements respondents' names and identifying information are not revealed within the report. Each respondent was provided a number (e.g. Respondent 1, 2 etc.) Appendix 1 provides information on how respondents have been grouped, offering a clearer understanding of where respondents information stems from. Although this interview group provided valuable information, this selection presupposed a particular type of institutionalized urban agriculture. Thus, I did not interview individuals who participate in non-institutionalized UA such as private backyard gardens or guerilla gardening. Information on these groups came from academic articles and non-academic media sources.

All interviewees were asked to respond to the same survey questions (Appendix 2). The survey's was constructed borrowing questions from Quon Soonya's report entitled: "Planning for Urban Agriculture: A Review of Tools and Strategies for Urban Planners" as part of Cities Feeding People Series Report 28. Additional open ended questions were formulated to tailor the survey to Toronto. Five of the interviews were conducted over the phone, while two provided written responses via email due to scheduling conflicts. The questions focused on UA's presence within Toronto addressing local policy recognition, participant typology, participant motivations, urban farmer's needs, and barriers to future growth. The length of the interviews ranged from 30 min to one hour depending on interviewees availability and length of responses.

In regards to limitations, I was unable to conduct interviews with Kampala City officials and community members due to time and funding restraints. In the future I intend to interview these groups to gain first-hand information on UA practices, policy, and barriers within Kampala. Additionally, future research would benefit from interviews with urban gardeners in Toronto who do not participate in institutionalized UA. A greater time frame and financing would also allow for more in-depth analysis involving site visits to gardens. These visits would permit observations of garden management providing additional understanding of their legal/

land ownership status. These limitations were mitigated with interviews from key informants recruited for their ample knowledge of and involvement in urban agriculture within Toronto.

Case Studies:

To establish context, two case studies were conducted examining the North American city of Toronto, Canada and the African city of Kampala, Uganda. These two cities were selected due to their global leadership in the realm of municipal food policy and support of intra-urban agriculture providing new opportunities for urbanites to cultivate food (Lee-Smith, 2005; Wekerle, 2002; Wilford, 2011; Rockefeller Foundation, n.d.). Unlike many municipalities globally, the local governments of Toronto and Kampala formally recognize UA activities for its role in increasing community self-reliance through urban food security.

The case studies present detailed information on UA practices, forms, and municipal policies along with community benefits and risks. The in-depth analysis serves to further answer the questions regarding what motivates urban dwellers to participate in UA activities. Also, how can UA assist in diminishing food-insecurities amongst populations of developed and developing cities?

Recommendations:

The recommendations are based on the analysis and case study findings. These carefully crafted recommendations outline steps that local governments, urban planners, and urban agriculture actors can take within Toronto and Kampala to foster food secure urban spaces though the careful integration of urban agriculture projects. Although culturally-specific modifications may be required these recommendations can be modified and applied globally to promote far reaching social, environmental, and economic community benefits.

The following research and recommendations are designed to provide urban planners, policy makers, NGOs, and community organizations within Toronto, Kampala, and elsewhere with a detailed guide outlining how to successfully integrate urban agriculture within their respective urban landscapes and policies.

Part 2: Literature Review

2.1. Urban Agriculture: A Brief History

By presenting a brief history of the urban/ agriculture relationship, this section will illustrate how the urban environment and agricultural sector have been historically linked and remain closely tied. This will be accomplished through a comparative analysis reviewing pre-industrial cities characteristics in relation to contemporary cities characteristics and practices. The objective of this overview is to illustrate how present urban agriculture practices in North America are not a new phenomenon, but rather, a resurgence of past urban practices; and how UA practices in Africa have persisted as a survival strategy.

Post-industrial North American cities of today organize and regulate various land uses through zoning. Zoning can be best understood as a land organizational tool, allowing municipalities and local governments to regulate and separate non-compatible land uses and activities within urban and rural environments. The most common zones are: Residential, Commercial, Industrial, Mixed-Use, and Agriculture. Each zone is provided a place within the city's boundaries and all legal activities are afforded a spot within the zone they are most compatible. In comparison to developed countries, urban centres of many developing countries within Africa possess less restrictive zoning policies, with many lacking enforcement mechanisms. Limited land-use controls weaken municipalities' ability to strictly define and enforce permitted land uses, resulting in a greater variation of activities within zones.

North America

Given the existing sharp delineation between land-uses within contemporary North American urban environments and the strong distinction between urban and rural activities, it is difficult to imagine a time when the line between urban/ rural was blurred and even non-existent. Within many contemporary post-industrial cities, agricultural practices have been designated within the Agriculture zone. This land-use designation places agricultural activities, such as crop cultivation and husbandry, outside the urban environment allocating them within suburban and rural locations (Maloney, 2013). However, such firm land-use designations, which aim to completely remove agricultural practices from the urban sphere, have only arisen within the last 100 years (Maloney, 2013). The contemporary division between urban and rural has been sharply defined and upheld by policy makers and urban planners. Within North America

specifically, these governing bodies use zoning and land-use planning as a means to naturalize the removal of food production from cities (Urban Farmer, 2013). Over the last century this trend has emerged from the dominant discourse describing cities as centres of "progress" and farming as "backward" (Urban Farmer, 2013). This anti-urban farming rhetoric is further supported by public health concerns characterizing husbandry and food cultivation as dangerous, dirty, and infectious (Urban Farmer, 2013). Although health concerns are valid when UA is unmonitored these views, along with rising urban land values and the global food system, have led to the marginalization of urban agriculture over the past century.

Throughout history and across geographical landscapes, both urban and agricultural growth have been closely linked and dependent on one another for resources (Jacobs, 1969). Traditionally, large scale rural agriculture allowed for the creation of parent cities by providing secure food supplies; while parent cities provided necessary resources and knowledge for the creation of new agricultural technologies (Jacobs, 1969). This interdependence required close proximity in order to protect local economies and food production (Maloney, 2013). Unlike the post-industrial city, the pre-industrial city displayed little functional differentiation of land use patterns (Sjoberg, 1960). In such a context, urban environments included not only business activities, but also agriculture and husbandry (Sjoberg, 1960). Early cities of the Mesopotamian era, and later pre-industrial cities, were home to a large number of agriculturalists who cultivated crops on plots within or just beyond the city's limits (Sjoberg, 1960). Within many pre-industrial cities' land was available for urbanites to cultivate, feed themselves, and sell excess produce in the urban market (Weber, 1958). This intra-urban agriculture allowed for high functionality within urban environments by encouraging the movement of fresh produce from local plots to urban markets (Sjoberg, 1960). Unlike post-industrial economies, pre-industrial economies relied more heavily on domestic agricultural production for local food supply. This reality provided agriculture with a prominent economic position and fashioned it tightly to urban dwellers lived experiences. Although the agricultural sector remains essential for societal subsistence, its economic centrality within post-industrial cities has diminished since the industrial revolution (Timmer, 1992).

With the onset of the Industrial Revolution, the 19C witnessed the transformation and re-organization of many North American cities (Mumford, 1961). Advances in transportation

technologies played an important part in this re-organization. The introduction of rapid transportation, infrastructure, and networks made it possible to physically separate modes of extraction and production from distribution and consumption (Ratcliff, 1949). Although large scale agriculture always existed in the urban periphery and rural landscapes, small scale urban agriculture had a place within pre-industrial urban environments, at times functioning to supplement rural agriculture (Maloney, 2013). With technological advancements these agricultural activities were eased out of the urban core creating more distinct labour divisions between 'urban' and 'rural' populations (Ratcliff, 1949). Industrialization re-defined urban land values and in turn land-uses placing urban property at a premium. This redefinition resulted in sharp distinctions between 'urban' activities and 'rural' activities placing agriculture heavily in the latter (Mumford, 1961). The growing of food and animals within city limits became discouraged and even banned as these activities were labeled unsanitary and an impediment to urban economic development (Bhatt & Kongshaug, 2005). This paradigm shift resulted in agriculture's general exclusion from North American urban landscapes deemed too valuable for natural features and food production (Mumford, 1961; Oueslati &Salanié, 2011). Further, with the expansion of global markets the need to produce one's own food was greatly reduced (Maloney, 2013). These new industrialized cities became void of many natural features marking a distinct separation between urban and rural land-uses (Mumford, 1961).

During the 1950s, North America witnessed the emergence of large scale industrial agricultural practices with the Green Revolution, spurred by world food shortages in the 1940s (Peters, 2010). Industrial agriculture is characterized by its large scale highly concentrated and specialized practices. To meet the needs of rapidly rising populations, these industrial agri-businesses tend to be run by corporations rather than individual farmers or land owning families and employ mechanically and chemically intensive farming techniques (Peters, 2010; Hanson, Hendrickson &Archer, 2008). Although industrial agriculture has been successful in supplying world markets with food stuffs since the early 20thC and thus should not be discounted as a food production mechanism its overreliance on chemical pesticides, high energy/ water consumption, and use of monoculture, have produced long term environmental, economic, and social effects (Peters, 2010; Viljoen 2008). Simultaneously, rapid urbanization is placing increased pressure on food producers to boost outputs in order to meet rising global food demands (Satterthwaite, McGranahan & Tacoli, 2010). UN Chief Ban Ki-moon announced the following to world

leaders: "The world needs to produce more food. Food production needs to rise by 50% by the year 2030 to meet the rising demands" (Peters, 2010, p. 7). Unfortunately, industrial agricultural practices are approaching their threshold. This is not to say that the introduction of new technologies cannot remedy the problem; however, the majority of the world's fertile land has already been cultivated and/ or taken over by urban development and rising environmental degradation has caused crop yields to decline (Peters, 2010). In response to rapidly growing cities and the impending food crisis, metropolises globally have experienced resurgence in urban agriculture practices (Smit &Nasr, 1992). This resurgence is part of a larger pattern, in which UA has appeared throughout history as a mechanism for increasing urban security in times of economic and food crisis (Maloney, 2013). It is important to note that UA is not intended to replace agri-business, but rather, supplement its practices.

Urban Agriculture appears throughout history and across borders, as a way to mitigate troubled economies and declining access to food products within cities. During the late 1800s in the United States, financial alarm and recession marshaled in a period of urban gardening in schoolyards and urban neighbourhoods vacant lots to deal with rising poverty (Maloney, 2013). Throughout both World Wars and the Great Depression federal and local governments in the United States encouraged citizens to plant victory gardens as a response to poverty, food shortages and economic need within urban areas (Maloney, 2013; World Commission on Environment and Development, 1987). During the 1960's and 1970's urban gardens were re-introduced across North America as a form of urban activism to counteract rising food prices, high energy costs, accessibility issues, concerns with foods declining nutritional values, urban neighbourhood decline, and environmental degradation (Maloney, 2013). These events illustrates how UA practices re-appear throughout North American history to address domestic insecurities and achieve political goals.

Africa

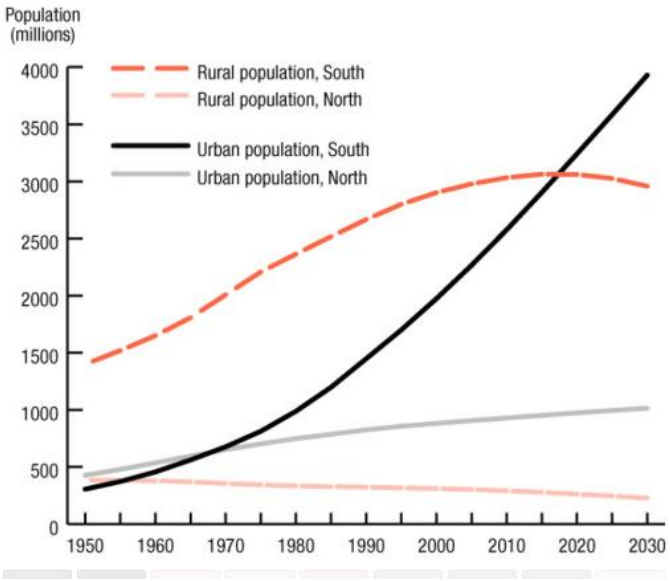
The continent of Africa does not share the same industrial history as North America. Unlike post-industrial North American cities, there exists limited functional differentiation of land-use patters within many African cities. The absence of functional differentiation creates an environment void of clear 'urban' and 'rural' divisions, allowing agricultural practices to remain a part of the urban (Mougeot, 2006). Such a context produces an urban landscape in which

"…roosters compete with the sounds of early morning traffic to announce the new day…and you may hear goats bleating, cattle lowing, and as the city wakes, the cries of street vendors offering fresh produce…" (Mougeout, 2006, p. 1).

Although generally not a desired activity, UA is a reality for most African cities (Mougeot, 2006). Municipal support for UA varies between cities ranging from its designation as an illegal and prohibited urban activity to its formal recognition and support within municipal policies as a mechanism for food-security and urban self-reliance (Orsini, Kahane, Nono-Womdim & Gianquinto, 2013). However, most commonly UA activities are ignored and undervalued leading to its marginalization (Simatele & Binns,2008). It is important to mention that UA is not a new phenomenon within developing countries but rather has been an important part of these civilizations throughout history (Mougeot, 2006; David, Lee-Smith, Kyaligonza, Mangeni, Kimeze, Aliguma, Lubowa & Nasinyama, 2010). Due to developing cities limited land-use controls, UA has tended to not been formally excluded; allowing it to maintain a permanent place within urban landscapes rather than re-emerge over the years. However, it is only within the last 30 years that UA has garnered academic and international policy interest for its part in urban food security (Mougeot, 2006).

Developing countries have experienced rapid urbanization since the turn of the millennium (Mougeot, 2006). Although rural to urban migration is not unique to developing countries, since the Industrial Revolution and WWII urbanization in developed countries has slowed to 0.4% annually; while in developing countries urban populations have an annual growth rate of 2.3% (Mougeot, 2006). This trend is significant, because although developed countries are more 'urban', developing countries are growing much faster and possess much larger populations (Mougeot, 2006). The following graph displays the projected rural and urban populations in developed and developing countries between the years 1950-2030, in order to illustrate this urbanization trend.

Figure 1: Rural and urban population in North and South, 1950-2030 (projected)



(Mougeot, 2006, p. 2)

The widespread practice of UA is largely a result of agrarian history and rapid urbanization, coupled with local governments' poor management of resources (David, Lee-Smith, Kyaligonza, Mangeni, Kimeze, Aliguma, Lubowa & Nasinyama, 2010; Orsini, Kahane, Nono-Womdim & Gianquinto, 2013). The crumbling social and physical infrastructures have led to urban environments riddled with poverty, requiring urban dwellers to adopt alternative survival strategies. In modern society, agriculture tends to be associated with rural landscapes. This conception leads to the notion that urban populations can rely on rural food production to meet their daily dietary needs (Orsini, Kahane, Nono-Womdim & Gianquinto, 2013). Such a system may be possible in North America, with its transportation networks and infrastructure afforded by its industrial history; however, many developing countries lack the necessary mechanism for such a system. The scarce infrastructure (transport, roads, markets, etc) in many African cities, in additional to, the low purchasing power of urban inhabitance makes such a food system more challenging to implement (Orsini, Kahane, Nono-Womdim & Gianquinto, 2013). Unreliable infrastructure, unemployment, civil unrest, and poverty in many African cities make urban food shortages a daily reality. To cope with food systems shortfalls, many urban residents turn to urban agriculture to produce fresh vegetables, milk, eggs, chickens, etc for personal consumption and market sale (Orsini, Kahane, Nono-Womdim & Gianquinto, 2013).

The emergence of the global food market has also produced different consequences for African countries than North America. These global markets have placed pressure on developing countries to produce lower value cash crops such as palm oil for world markets (Balch, 2013). Cash crops (which will be discussed in greater detail within the Food Miles section) can lead to local farmers and traditional farming practices being displaced by industrial mono-cropping (Bareja, 2010). The products produced are for direct market sale and provide little to no food products for local communities (Bareja, 2010). Although this push for specialization in the production of goods and services provides competitive market advantages in the short term such conditions can be disastrous when trade conditions change i.e. when products can be produced more cheaply elsewhere. Developing countries overreliance on cash crops can be seen as increasing the need for urban agriculture, as by their very nature, they decrease the amount of rural crop production for local consumption.

The appearance of UA in times of economic, social and food crisis within North American and African cities illustrates UA's ability to ease public distress, promote food security, and assist in poverty alleviation. Such alternative practices also demonstrates urbanite's will and ability to produce food for personal and community consumption.

2.2. Background: Food Miles Calculating the Consequences

This section places food consumption within the context of 'food miles' in order to illustrate how consumption patterns reliant on international food trade markets affect environment and human health.

Technological advancements, such as refrigeration systems and preserving chemical sprays, have allowed for the international trade of perishable food products like never before. Technological advancements in food preservation, production and transportation; coupled with economic growth and the expansion of global trade markets, have resulted in the food we consume traveling thousands of miles before reaching our tables (Halweil, 2002). On average one North American meal travels approximately 1,200 Kilometers from farm to table (David Suzuki Foundation, n.d.). The calculated distance food travels by boat, plane, train, and automobile from where it is grown to where it is consumed is defined as 'food miles' (Natural Resources Defense Council, 2007; Halweil, 2002; Xuereb, 2005; Caraher & Coveney, 2003).

Global food systems, which are entirely dependent of fossil fuels, include the: production, processing, distribution, sale, purchasing, preparation, consumption, and waste disposal pathways of foodstuff (Pirog, Van Pelt, Enshayan & Cook 2001; de la Salle & Holland, 2010). Globally, communities and their inhabitants have become increasingly dependent on food from distant sources. The past 40 years has witnessed the values of the international food trade triple, and the tonnage of food shipped across national borders quadruple, while the population has only doubled (Halweil, 2002). This international food market has allowed overwhelming choice in local grocery stores as those with the means can purchase any food, anytime, anywhere (Halweil, 2002; Lander, 2011). However, using imported ingredients for dietary staples (meats, grains, fruits and vegetables) can consume four times the amount of energy and create four times the amount of greenhouse gas (GHG) emissions compared to locally produced goods (Halweil, 2002). The award winning novelist and historian Ronald Wright (2009) sums up the issue by saying:

> "We tend to think of the looming energy crisis in terms of cars, factories, heating and air conditioning, but the first thing to keep in mind is that fossil fuels are feeding us…how many are aware that we have literally been eating oil and gas for more than a hundred years?"

Food miles have considerable consequences for environmental health as they contribute to GHG emissions. A study conducted in Waterloo, Ontario examined the GHG emissions of 58 commonly consumed imported food items. This study is pertinent as these 58 food products; including meats, fruits, and vegetables, could all be grown and raised locally (Xuereb, 2005). The imported foods GHG emissions associated with transport were determined through an examination of the foodstuff's travel distance from its place of production to its destination in Waterloo, Ontario and their mode of transportation (i.e. Air, Marine, Rail and Truck). The findings indicated that the transportation of the 58 imported food items generated 51, 709 tonnes of GHG emissions annually, equivalent to the emissions produced by 16,918 cars being driven over the course of one year (Xuereb, 2005 p. 12). These emissions represent 5.9% of the total GHG produced in the Waterloo Region (Xuereb, 2005, p.12). When broken down per kilometer, the food items traveled an average of 4,497 km producing approximately 1.3 kg of GHG emissions per kilometer of travel for every kilogram of food imported (Xuereb, 2005, p. 12).

When compared to the GHG emissions of the same 58 foods produced locally within the Waterloo Region, the food items would only travel 30km from farm to table and would generate only .008kg of GHG emissions per kilometer travelled for every kilogram consumed (Xuereb, 2005, p. 13).

Transnational transportation of food items produce high levels GHG emissions from the burning of fossil fuels (Pirog, Van Pelt, Enshayan & Cook, 2001). These high levels are detrimental to environmental health and are positively linked to global climate change (Pirog, Van Pelt, Enshayan & Cook, 2001). When the distance of travel from farm to table is shortened, GHG emissions during transportation are reduced, along with the need to refrigerate and preserve food from spoilage (David Suzuki Foundation, n.d.; de la Salle & Holland 2010). Local sales chains, when well organized and monitored, can reduce GHG emissions and mitigate negative environmental impacts of global food consumption through energy efficient forms of food distribution (Mundler & Rumpus, 2012; de la Salle & Holland, 2010). Additionally, reducing the transportation distance of foods would benefit human health by reducing air pollution caused by diesel soot and emissions (Natural Resources Defenses Council, 2007). A study conducted by the California Air Resources Board in 2005, examined air quality near transport facilities in California and found higher levels of diesel soot pollution along with

corresponding spikes in asthma rates and other respiratory illnesses amongst local residents than in other urban areas (Natural Resources Defenses Council, 2007). Thus, pollution caused by food transportation does not only effect the environment but also local residents.

The 'food miles' concept has been the subject of some criticism. In response to local food production advocates, who condemn the transnational food system for increasing GHG emissions, global food system supporters draw attention to the food production stage. Critics of the 'food miles' discourse state that consumers should be less concerned with how 'far' a product travels and more concerned with 'what' the product is and 'where' it is being produced (de la Salle & Holland, 2010; Lander 2011). This argument is based on the idea that the production stage can consume more energy than the transportation stage as a product requires different production inputs depending on its geographic location (Desrochers & Shimizu, 2010). Thus, geographic locations requiring the use of greenhouses and/ or other heating and cooling mechanisms require greater energy consumption than more favourable climates i.e. UK apples kept in cold storage consume more energy than transporting fresh apples from New Zealand or Argentina (Desrochers & Shimizu, 2010; de la Salle & Holland, 2010; Lander 2011).

Furthermore, Desrochers and Shimizu argue that global food systems are necessary to ensure food security (2013). Desrochers and Shimizu state that the current large scale and specialized global food system, grew out of the necessity to protect communities from food shortages by cultivating various crops in the most suitable regions of the world and transporting the products grown to the markets of less suitable regions (2013). The proponents of transnational food systems further argue that if a community relies entirely on locally sourced food products, they are risking famine caused by unforeseen drought, frost, hail, and other natural disasters (Desrochers & Shimizu, 2013).

It is undeniable that some environments offer better growing conditions than others for the same product. However, it would be socially and environmentally irresponsible to ignore the considerable environmental, community health, and socio-economic consequences of the global food market, identified by the food miles debate. Thus, although advocates for global food systems present compelling arguments, they tend to ignore the social impacts of the global food market which lead to: multiple health risks stemming from food preservatives and chemicals, the displacement of local farmers and farms, and risks related to large-scape cash crops.

Rapid urbanization and global food markets, which displace local food producers, have led to a nutrition transition where people in both developed and developing nations are consuming foods high in fats, saturated fats and sugars (Drewnowski & Popkin, 1997; Stuckler, 2008). This dietary transition increases population risks of becoming obese and contracting non-communicable diseases such as: diabetes, hypertension and cardiovascular diseases (Drewnowski & Popkin, 1997; Caraher & Coveney, 2003). Increases in non-communicable diseases as a result of consuming processed energy- dense foods has implications for citizen's health, placing strain on nations health care systems (Abdulkadri, Cunningham-Myrie & Forrester, 2009; de la Salle & Holland, 2010).

Further linked to consumer health, food in the global market is comparatively less nutritious than locally grown produce due to preservatives and chemical sprays (Hird, Emerson, Noble, Longfield, Williams, Goetz, Hoskins, Paxton & Dupee, 1999). In order to preserve food for long distance transport, food products are chemically processed and sprayed to increase their shelf life (Hird, et al., 1999). The process of preserving and storing perishable food products, such as fruits and vegetables, reduces their nutritional value; for example the levels of vitamin C, water soluble proteins, and chlorophyll contents of fruits and leafy vegetables drops rapidly after they have been picked processed, and stored (Hird et al., 1999; Landers, 2011). This means that the further food travels before it arrives on your table the less nutritious it is (Hird et al., 1999).

Although Herd et al (1999) and Landers (2011) provide a compelling argument, it seems to overlook the point raised by Desrochers and Shimizu (2013) that not all geographic locations have the climate capability to cultivate all the foods needed for their populations. The global food market's promotion of crop specialization has reduced the instances of famine, and allowed cooler climate countries, such as Canada, to enjoy products they could not otherwise produce naturally, such as citrus (Desrochers & Shimizu, 2013) . It is thus necessary to find a middle ground between these two camps. This middle ground should incorporate the global trade of foods that cannot be produced locally without energy intensive heating and cooling mechanisms; while also, support the production of locally grown crops native to the area as a means of reducing unnecessary imports i.e. Washington apples to the Okanagan Valley.

From a socio-economic perspective, the global food market has created conditions leading to the displacement of local food producers (Halwail, 2004). This displacement has

occurred as local farmers find it increasingly difficult to compete with low cost imported products (Halwail, 2004). Farmers in the Okanagan Valley of British Columbia, Canada stated that apples imported from Washington have greatly depreciated the value of locally grown apples making it increasingly difficult to cover production costs (Lander, 2011). Personal discussions with an Okanagan orchardist revealed that many have removed, or are contemplating the removal of, their apple trees in order to plant more profitable crops such as grapes for wine making (Owner of Orchard Summerland, B.C., Personal correspondence, January 4, 2014). The flood of low cost imported products is cause for concern as local producers are being pushed out of their local markets (Halwail, 2004; Lander, 2011). On a larger scale this is contributing to the loss of locally grown produce on highly arable land, reducing the number of local farms and agriculturalists (Halwail 2004; Lander 201).

In reaction to the loss of local food production within North America, Alternative Food Movements (AFM)[4] have appeared. AFMs lobby for the production and consumption of locally cultivated foods. This movement emphasizes local food systems role in: protecting local producers from global markets, increasing urban resident's accessibility to fresh foods, and promoting food-security amongst low-income groups (Hoover, 2013). AFMs idealize consumer's relationship with local farmers and asserts the notion that if people knew more about the social and economic benefits of locally cultivated foods, they would be willing to pay a higher price for the products (Guthman, 2008). This position assumes that, food produced locally in ecologically sustainable and socially just ways will indeed cost consumers more than the same food produced within the global food market (Guthman, 2008). Thus, this anti-global market stance may be attractive to middle and high income consumers with the monetary means to afford the higher costs; however, low-income groups who lack the same monetary freedom may be disadvantaged. This is ironic, as the very group which the movement seeks to increase food-security and accessibility to fresh foods for, is the very group which will be unable to afford the products. This conundrum leads to issues of policy and the necessity to balance the needs of local farmers with the needs of all local consumers. Issues related to the AFM in regards to urban agriculture within developed and developing nations will be discussed in more detail within the

[4] Alternative Food Movements have origins in farm environmental issues. In the 1990s with globalization, this view was broadened to incorporate social analysis addressing social injustice related to class, gender, and hunger (Kloppenvurg, Lezberg, De Mater, Stevenson & Hendrickson, 2000). Within this framework the movement understands food as a human right rather than a commodity (Jarosz, 2008).

following sections. These discussions will shed more light on motivations for participating within the AFM, its benefits and risks, as well as, how different waves of the AFM can be inclusive to all income groups with help from targeted municipal planning and policy.

As in North America, the global food market has altered food production practices within low-income developing countries. Due to global market pressures, the presence of cash crops within developing nations has become a growing concern. Cash crops, also known as commercial farming, are crops produced for direct market sale and provide little to no food products for local communities (Bareja, 2010). Cash cropping is a byproduct of the global food market and trade demands which concentrate large-scale mono-cropping within specific geographic locations. Although specialized production in amenable climates can produce high crop yields for market sale, local large scale mono-cropping is dangerous as it reduces the production of traditional and diverse agriculture increasing land degradation, deforestation, and the risk of food insecurity (Pender, Nkonya, Kato, Kaizzi, & Ssali, 2009; Srichaiwong, Kwewjai, & Kroesksakul, 2014; Balch, 2013; Obidzinski, Andriani, Komarudin, & Andrianto, 2012).

The production of and over reliance on cash crops can lead to far reaching negative social, environmental and economic implications for developing countries. Such effects are exemplified with the production of the cash crop palm oil. The global demand for palm oil stems from its versatility, as this edible plant oil is used in making everything from margarine and soaps to shampoos and fuels (Balch, 2013). Palm oil production is largely concentrated in Malaysia and Indonesia and has been deemed responsible for widespread deforestation, soil degradation, and the loss of traditional crops leading to increased food insecurity (Obidzinski, Andriani, Komarudin, & Andrianto, 2012).

The large scale production of cash crops, caused by international demand, does little to help local farmers and communities; often destroying the production of traditional agriculture. To mitigate the negative effects of cash cropping, organizations such as Roundtable for Sustainable Palm Oil (RSPO) are working towards promoting responsible commercial production methods with the establishment of principles and criteria for mutually beneficial commercial farming (Balch, 2013). The goal of RSPO is to stop illegal deforestation, chemical pollution, destruction of biodiversity, and poor employment conditions (Balch, 2013).

In response to many of the environmental, health, and socio-economic consequences arising from long distance food transportation and food insecurities, a number of community organizations within developed and developing nations are advocating for the promotion of locally grown food items cultivated within the urban fabric to promote sustainable agricultural practices (Lee-Smith, 2010, David Suzuki Foundation, n.d., Toronto Urban Growers, n.d.; de la Salle & Holland, 2010). This leads us to the question, what is urban agriculture (UA)? And can UA, as an alternative food movement, overcome criticisms of other local food movements by placing higher priority on social equity and inclusion? The following section will discuss UA and its practices within the present urban context.

2.3. Defining Urban Agriculture

What is Urban Agriculture (UA)? This section will define urban agriculture within the present context, identify UA's multiple forms, illustrate how it differs from rural agriculture and discuss its practices, scale, products, and locations.

In the year 1996 a global survey, funded by the United Nations, estimated that 800 million urban dwellers engaged in urban agriculture activities (Lee-Smith, 2010). These urban dwellers participated in such activities for either subsistence or market-sale (Orsini, Kagane, Nono-Womdim & Gianquinto, 2013).The growth of UA as a global phenomenon is becoming too great to ignore, garnering much international attention. So what is urban agriculture (UA) and how does it appear in modern cities of today? The term urban agriculture arose to describe the production, processing, and distribution of plants, vegetables, and animal products within urban and peri-urban areas for home consumption and local market sale (Orsini et al., 2013, Baumgartner & Belevi, 2001). This definition provides information on 'what, where, and why' and helps to distinguish between urban and rural agricultural activities (Baumgartner & Belevi, 2001). However, this definition may be criticized for its narrow scope and simplicity. Mougeot's (2000) definition adds complexity to the above description by emphasizing UA's functional role and prominent place within the city:

> "UA is an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows or raises, processes and distributes a diversity of food and non-food

> products, (re-)using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and, material resources, products and services largely to that urban area" (p.10).

The above definition is recognized throughout relevant literature as a well encompassing description, illustrating how UA is embedded within a city's economic, social, and ecological fabric. This explanation is useful when trying to understand why UA practices are becoming more widespread in developed and developing nations (Mougeot, 2000). However, for the purposes of this report I propose adding one more component to the definition; being, urban dweller's participation in intra-urban agriculture for the purpose of personal consumption and leisure. Such an adaptation allows the definition to include 'industry' motivations, generally implying the marketing of products, as well as non-industry motivations. This broader understanding of UA will prove useful when discussing motivations for participation within varying geographic and socio-economic contexts.

Given the unique forms and variations of UA globally, literature tends to define its practices in general terms; with emphasis on its specific characteristics varying between the geographical contexts in which it is discussed. The definition of UA will continue to evolve as its practice is applied to an ever-diverse array of contexts and purposes (Mougeot, 2005). This being said, four reoccurring features have been identified throughout the literature and serve to explain UA practices as a whole. These four features are: Location & scale (where), activities and stage (what), stakeholders (who), and motivations (why) (Baumgartner & Belevi, 2001; Quon, 1999; Mougeot, 2000). Although a single universal definition of UA does not exist, these four reoccurring features help us understand UA practices within cities of both developed and developing nations.

Location & Scale (Where):

When discussing the location of urban agriculture the literature distinguishes between 'intra-urban' and 'peri-urban'. Intra- urban agriculture exists within urban boundaries and includes the cultivation of vacant lots and open spaces (Halloran & Magid, 2013). Intra-urban refers to a broad land-use category and differs slightly between developing and developed countries. Within developing countries a city's intra- urban agriculture is less formally organized and most commonly found within a variety of vacant open spaces such as: on roadsides, near

railroad tracks, industrial areas, in the middle of roundabouts, around airports, under power lines; and on marginal lands such as along rivers, river valleys or flood plains (Halloran et al, 2013; Simatele & Binns, 2008; Lee-Smith, 2010). In developed countries intra- urban agriculture is generally more organized, occurring within planned community gardens, vacant lots, on rooftops, public institution spaces (i.e. school yards and hospitals), and church grounds (Toronto Food Policy Council, 2012; Colasanti, 2009; FoodShare, n.d; Maloney, 2013).

Like intra-urban agriculture, peri-urban agriculture provides foodstuffs for both urban farmers and urban residents (Baumgartner & Belevi, 2001). Peri-urban agriculture is distinct from intra-urban given its compilation of rural and urban features (Baumgartner & Belevi, 2001). Peri-urban, in both developed and developing cities, is strongly influenced by its proximity to an urban hub, relying heavily on transportation networks to and from its parent city (Narain, 2009). The plots of peri-urban agriculture are located on the periphery of the city where land values, land uses, property rights, and accessibility to city markets push for more land intensive agricultural practices on smaller plot sizes than traditional agriculture (Halloran et al, 2013; Maxwell & Armar-Klemesu, 1998; Mougeot, 1998; Baumgartner et al., 2001). Although not regulated out of existence like intra-urban agriculture by way of land use zoning and policy, peri-urban agriculture in both developed and developing nations is threatened by urban expansion (Narain, 2009). Urban expansion has led to encroachment onto peri-urban agricultural lands, producing ramifications for farming practices. These ramifications are felt with new residential developments increasing the population of non-farmers within the area and creating competition for land uses (Sharp & Smith, 2002). In North America, this rural- urban interface has made it necessary for farmers and non-farmers to build strong relationships in order to peacefully co-exist and reduce conflicts over farming practices (Sharp & Smith, 2002).

Urban agriculture's scale is heavily dependent on the availability and access to land, water resources, security of user's rights, and land rent prices (de Zeeuw, Guendel & Waibel, n.d.). The size of UA ventures vary greatly, appearing as individual or family farms, group or cooperative farms, and commercial enterprise ranging from micro- small farms to large scale enterprises (Dubbeling, de Zeeuw & van Veenhuizen, 2010). Additionally, peri-urban agriculture's scale is influenced by its travel distance to its parent city; along with its socio-economic connections to the city's markets (Baumgartner & Belevi, 2001). Urban agriculture is

distinguished from rural agriculture by the following features: low capital, relatively small scale, utilization of intensive production methods, incorporation of natural resources, and re-use of urban waste (Colasanti, 2009).

Activities & Stage (What):

Urban agriculture (both intra-urban and peri-urban), produce a large variety of food and non-food products directly to urban farmers and residents. With growing urbanization rates and corresponding demands for alternative food supplies, UA plays a role in providing perishable products to local markets. In developed and developing cities a variety of fruits and vegetables are harvested, varying by climate including: root crops, leafy vegetables, and tree crops (De Bon, Parrot & Moustier, 2009; Lee-Smith, 2010; Mawois, Aubry & Le Bail, 2011; Simatele & Binns, 2008; World Commission on Environment and Development, 1987; Dubbeling, de Zeeuw & van Veenhuizen, 2010). Additionally, in developing cities, given the less restrictive urban practice policies, it is not unusual for urban farmers to provide eggs and dairy products, as well as, meats including: fish, poultry, rabbits, sheep, goats, cattle, and pigs (De Bon, Parrot & Moustier, 2009; Lee-Smith, 2010; Mawois, Aubry & Le Bail, 2011; Simatele & Binns, 2008; World Commission on Environment and Development, 1987; Dubbeling, de Zeeuw & van Veenhuizen, 2010).

In addition to food products, UA also provides non-food products such as: ornamental plants, flowers, aromatic and medicinal herbs, and tree products (De Bon, Parrot & Moustier, 2009; Lee-Smith, 2010; Mawois, Aubry & Le Bail, 2011; Simatele & Binns, 2008; World Commission on Environment and Development, 1987; Dubbeling, de Zeeuw & van Veenhuizen, 2010). Compared to rural agriculture, UA generally favours more perishable and relatively high valued crops and by-products (Dubbeling, deZeeuw & van Veenhuizen, 2010). Further, UA products differ from their rural counterparts as they tend to be more specialized, with exchanges occurring directly across production units (Dubbeling, deZeeuw & van Veenhuizen, 2010).

Within developing countries, facing higher instances of chronic food-insecurity, these foods are essential sources of micronutrients, necessary for citywide and household-level food security measures (Mougeot, 2005). In comparison, UA within relatively food-secure developed cities, provide urban residents with local fresh alternatives to the global food market; as well as,

additional supplies for participating local food banks and charities (Roman-Alcalá, 2013; Dubbeling, de Zeeuw & van Veenhuizen, 2010).

The intensive production of urban plots, coupled with short crop cycles, allow urban farmers to plant multiple crops on one small piece of land (Mawois, Aubry & Bail, 2011). In order to maximize seasonal production, urban farmers will often chose to plant crops with short crop cycles i.e. leafy vegetables with a crop cycle of 21-35 days (Mawois, Aubry &Bail, 2011). This allows urban farmers to increase yields for personal consumption or increase quantities for market sale.

Stakeholders (Who):

UA appears in diverse forms and occurs for a myriad of reasons including: subsistence, food security, improvements to city ecology, environmental activism, social activism, political activism, leisure, employment opportunities, and income generation (de Zeeuw Henk, Guendel Sabine & Waibel, n.d.). UA's multiple forms are related to participants varied motivations for engaging in such activities, producing a wide range of stakeholders (de Zeeuw Henk, Guendel Sabine & Waibel, n.d.).

Globally, UA participants vary within and between cities of developed and developing nations. As previously mentioned the United Nations Global Survey (1996) estimated that 800 million urban dwellers engage in some form of UA activities (Lee-Smith, 2010). Cohen and Garret provide further details on urban agriculture participation, finding that approximately 200 million urban dwellers who engage in UA activities produce foodstuffs for local market sale, accounting for 15-20% of global food production (Cohen & Garrett, 2010). Within developing nations participants are predominantly the urban poor, with 65% of all actors being female (Simatele & Binns, 2008; Cohen & Garrett, 2010; van Veenhuizen, 2006). Much support for UA within developing nations stems from international organizations; namely, the IDRC, FAO, and UN-Habitat, as well as various NGOs (Mougeot, 2006). In developed nations, UA is a part of the Alternative Food Movement (AFM), constructed largely in opposition to the global food market (Jarosz, 2008) The AFM, is predominantly a middle-and upper- class movement championed by notions of food justice and security; along with, the promotion of environmental, social, and political activism (Jarosz, 2008; Hall, 2011). Although the AFM was developed with

the goal increasing low-income and minority groups access to nutritious foods, it has been criticized for its dominant discourse reflecting whitened cultural histories, leading to the unintentional exclusion of minority and low-income groups (Guthman, 2008; Hall, 2011). These criticism, in relation to UA, will be unpacked within the North American section below.

Although UA is largely practiced by low-income women within developing cities, the literature also reveals participants who are: government officials, professionals, teachers, students, casual labourers, the unemployed, part-time workers, and migrant farmers from surrounding rural areas (Satterthwaite, McGranahan &Tacoli, 2010; Mawois, Aubry & Le Bail, 2011; Simatele & Binns, 2008; Halloran & Magid, 2013). In developed cities, participants have been identified from all ages and backgrounds, including: school children, professionals, government workers, people with previous growing experience, novus gardeners, food bank volunteers, those with physical or mental health needs, low-income, middle income, and upper income groups (Respondent 1; Respondent 4; Respondent 5; Respondent 6).

In addition to those directly involved in the production of urban food, there are also members from the private, public, and non-profit sectors engaging in collaboration to promote sustainable food networks locally and globally (de la Salle & Holland, 2010). Partnerships have been formed between various public, private, non-government organizations, academics, and community organizations striving to transform the traditional food market and lobbying for the inclusion of urban agriculture within city plans (de la Salle & Holland, 2010; Bhatt & Kongshaug, 2005).

This diverse group of stakeholders represents the broad nature of UA and its multiple forms across the globe. Understanding who participates in UA activities allows for a clearer appreciation for the motivations behind UA and its practices.

Motivations (Why):

Intensive urbanization within developed and developing countries has led to the loss of arable land. Population growth and land-use changes have also contributed to rising urban poverty rates, relative food- insecurity, and unemployment; along with, a growing demand for local food production, and the design of sustainable cities (Satterthwaite, McGranahan & Tacoli, 2010; Mougeot, 2000; World Commission on Environment and Development, 1987; Simatele &

Binns, 2008; Lee-Smith, 2010; De Bon, Parrot & Moustier, 2010; Halloran & Magid, 2013). These realities of the urbanized world are in part responsible for the existence of UA. The drivers for UA development can be summed up into the following motivations, being: food/ nutrition security; income/ employment generation; political, social, and environmental activism; promotion of sustainable cities; as well as, leisure and nutritional education. These motivations are central to the continual development of UA across the globe and will be discussed in greater detail when examining the social, economic, and environmental benefits and risks associated with urban agriculture in the following section.

2.4. Urban Agriculture: Benefits and Motivations

This section will explore the motivations behind urban agriculture engagement in conjunction with UA's multiple benefits. The following section is divided into four parts beginning with a discussion on urban food (in)security and followed by discussions on UA's economic benefits/ motivations, social benefits/ motivations and lastly, environmental benefits. The section will set the stage for how UA can be used as a policy and planning tool to improve the economic, social, and environmental realities of urban realm within both developed and developing nations.

2.4.1. Urban Food (In)Security:

The World Food Summit of 1996 defined food security as "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life" (World Health Organization, 2014). The three main components of food security are 1. Availability; 2. Access; and 3. Knowledge of appropriate food use to maximize nutritional value (World Health Organization, 2014). Food security is necessary for sustainable development and growth of communities and is recognized as a basic human right within Article 25 of the Universal Declaration of Human Rights, stating: "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food…" (U.N., 1948). Article 11 of the International Covenant of Economic Social and Cultural Rights further supports this position by affirming "the right of everyone to be free from hunger" (Armar-Klemesu, n.d). The desirable outcome is not food self-sufficiency, but rather food security. This means coming up with local economic development policies that give all residents access to reliable, safe, and, diverse sources of affordable food from both local and global markets.

Despite Article 25, people world-wide experience limited availability and insecure access to nutritious food products. Further, in spite of the increasing problem of urban food insecurity and the rising rates of urban poverty, most municipalities still lack essential food policies needed to protect urban dwellers and their food supply chains (van Veenhuizen, 2006). Current trends examining urban food supply chains and food security reveal that reliance on rural food production is increasingly insufficient, especially for the urban poor (FAO, 2001). Given that food is a basic human right, not to mention need, urban food security issues must be remedied by policy makers and planners. In order to increase urban food security policy makers and planners must examine the benefits and risks of promoting agricultural production within and around cities (van Veehuizen, 2006).

The world food crisis of 2007 and 2008 witnessed a dramatic increase in the cost of staple food products, and exemplified just how vulnerable developing and developed countries are to fluctuations in food prices, especially amongst the urban poor (de la Salle & Holland 2010). Although slight declines in food prices have occurred since 2008, most analysts hold that prices will not return to levels of the early 2000s (Satterthwaite, McGranahan & Tacoli, 2010). Food prices are expected to remain high due to the unrelenting demand for energy and cereals for food, feed, and fuel; as well as, a consequence of structural land and water constraints, and rapid climate changes impacts on food production (Satterthwaite, McGranahan & Tacoli, 2010; Despommier, 2010).

Rapid climate change (RCC) and rising greenhouse gas (GHG) emissions have been a contentious issue, especially with regards to their implications for global food production (Despommier, 2010). Due to pattern changes of global temperature and precipitation, where we cultivate food today will differ from where we can cultivate food in the years to come (Despommier, 2010). RCC and GHG emissions strongly influence global food security even in the most advanced countries (Despommier, 2010). This vulnerability has raised global awareness around the need to implement sustainable strategies for food security and safety (Despommier, 2010). With yields from traditional farming practice declining globally, it is undeniable that other mechanisms for food production must be explored (Despommier, 2010).

As mentioned above urban dwellers can be greatly affected by food insecurities due to limited access, availability, and knowledge of food products. At this point it is important to

distinguish between causes of food-insecurities within poor developing and affluent developed countries. This distinction is important in order to avoid false universal assumptions of experience.

Within developing countries urban dwellers' food security is greatly reduced by limited accesses to and availability of nutrient rich food products, especially amongst the urban poor (van Veenhuizen, 2006). Accessibility issues arise from the cash economy of cities, requiring steady access to currency (Mougeot, 2005). Low-income urban households spend between 50-80% of their disposable income on food, but are still unable to meet their basic nutritional needs (Mougeot, 2005). Access barriers are conflated by availability issues. Availability issues, stemming from eroding physical infrastructure and transportation networks, further enhance urban poor's vulnerability to food-insecurity (Vermeiren, Rompaey, Loopmans, Serwajja, & Mukwaya, 2012). Poor infrastructure and networks result in the unreliable delivery of food products from sites of rural production to urban markets (van Veenuizen, 2006). These unreliable food networks make it necessary for urban poor to find alternative means to feed themselves and their households.

Unlike developing nations, affluent developed countries have ample availability of nutrient rich foods due to strong food system chains and transportation networks. Thus, within developed countries, food-insecurity has less to do with availability and more to do with access and knowledge (Lang, n.d.). Dr. Tim Lang (n.d.), Professor of Food Policy at Thames University, states that although there are "mountains of food in his country [Britian, U.K.] and miles of supermarket shelves" many British residents are unable to afford adequate diets, resulting from unemployment and declining social welfare. Similarly, within Canada 13% of households, including 1.5 million children, experience some level of food insecurity reducing their ability to satisfy daily nutritional needs (Tarasuk, Mitchell,& Dachner, 2012; Council of Canadian Academies, 2014). Thus, even though nutrient rich food is available, a surprising number of residents have reported accessibility issues arising from unemployment and poverty (Tarasuk, Mitchell & Dachner, 2012).

In addition to access, the loss of knowledge regarding appropriate food use and choices have been connected to rising food-insecurity within affluent countries (Schmid, Peterson, Maclnnis, Zimmerman, Fitzpatrick, 2011; Council of Canadian Academies, 2014). The

overabundance of pre-packaged and frozen food products, offering little to no nutritional value, have contributed to the existing disconnect between healthy food production and consumption (Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011; Finley, 2013). Such circumstances have led to a collective loss of knowledge, in which many people no longer know how to select and prepare foods to satisfy their nutritional needs (Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011; Finley, 2013). Food-insecurity stemming from a lack of food knowledge has the potential to produce negative health implications such as: malnutrition, infection, obesity, anemia, cardiovascular disease, diabetes, stress, and child development issues (Council of Canadian Academies, 2014). The relationship between food-security and knowledge is further emphasized within developed nations Alternative Food Movement, stressing the need for education through UA projects as a means to increase food-security (Slocum, 2007).

It becomes apparent that food security is a multifaceted problem comprised of social, economic, and environmental issues. In the face of volatile food prices, climate change, and declining crop yields reducing urban dwellers food-security; many urbanites around the world are reacting by growing cops within and around their cities (Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011; Finley, 2013; Warhurst, 2012). However, it is important to draw attention to temporal differences of the UA phenomenon taking place within developing and developed countries. Developing countries, facing chronic food-insecurities related to daily accessibility and availability issues employ UA practices to satisfy immediate dietary needs (Lee-Smith, 2013; Simatele & Binns, 2008). In contrast, within the relatively food-secure environments of developed countries, UA is constructed within the AFM as a means of preparing for the future and educating urban residents (Vancouver Island Community Research Alliance, 2011). Local food production is thus promoted as a means to increase food-security within the present context, while also establishing local food structures to safeguard against impending food shortages arising from unsustainable agri-business practices (Vancouver Island Community Research Alliance, 2011).

As has been done in the past, urban agriculture is once again appearing as a means of increasing food-security amongst urbanites. Research into the UA phenomenon reveals that such practices contribute to a non-negligible percentage of all food consumed by urban households, especially amongst the urban poor of developing nations (Mougeot, 2005). Urban food

production and vending makes fresh products more readily available to urban populations who would otherwise be unable to access such products (Mougeot, 2005). In order to sustain critical local food supply chains appropriate urban planning, micro-credit, and food safe practices must be supported to assist in bolstering urban agricultures contribution to food-security (Mougeot, 2005). The multiple social, economic, and environmental benefits of UA, which will be discussed in the following sections, makes it an excellent tool for poverty alleviation and for promoting food-security.

2.4.2. Urban Agricultures Economic Benefits/ Motivations

Urban agriculture (UA) has appeared within developing and developed nations as a coping mechanism, to deal with diverse development challenges of urban poverty and food insecurity (Mougeot, 2000). Rising rates of urbanization in developing countries have outpaced cities abilities to provided employment and services to the growing population's; similarly in developed countries post-industrial economies, rising rates of unemployment and underemployment have created income crisis amongst citizens (van Veenhuizen 2006; Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011; Finely, 2013; Mougeot, 2005; McClintock, 2010; Lang, n.d.). Within both developing and developed nations, UA has been employed by diverse groups of urban residents as a means to increase access to and knowledge of food; as well as, an important source of informal employment and income generation (van Veenhuizen, 2006). Although UA has been sourced as an urban coping strategy, its economic importance varies greatly between developed and developing cities (McClintock, 2010). From this standpoint, the following discussion will examine the varying importance of economic motivators for UA participants within developed and developing cities.

Despite urban agriculture's potential to produce economic benefits, monetary motivations do not appear to be the main drivers for participation within developed cities (Shinew, Glover & Parry, 2004; McClintock, 2010). Although low-income North Americans have, to some extent, always participated in UA for subsistence within the present context of community gardens and allotment plots, UA is generally categorized as a leisure activity (Smith, 2012; Shinew, Glover & Parry, 2004). The construction of UA as a leisure activity, has arisen with many urban dwellers growing desire to rebuild broken connection between food production and consumption and to strengthen community bonds (McClintock, 2010). Environmental Sociologists have framed

urban dwellers alienation to food production networks and weakened community ties as byproducts of the global capitalist market (McClintock, 2010). Furthermore, the Alternative Food Movement spearheaded my middle and upper-income urban residents have emphasized UA's role in social, environmental, and political activism (Roman-Alcalá, 2013). Within this context participation in UA activities is less motivated by immediate monetary necessity and more so as a way of promoting food justice, knowledge, and security through social activism and environmental stewardship by those with the necessary time and resources (Roman-Alcalá, 2013).

Although economic necessity is not the main motivation for urban dwellers' participation within North America, literature has revealed economic benefits which are important for its future contributions to post-industrial landscapes. These benefits can be categorized into the following four headings: 1.Employment creation, Training and Business Incubation; 2. Financial Savings on Food Purchases; 3. Cost Savings for Municipal Agencies; 4. Increase Neighbourhood Property Values.

1. UA's role in Employment Creation, Training and Business Incubation:

Although skepticism around UA's economic contributions within North America exists research has revealed its potential to create jobs, provide training, and act as a tool for business incubation (Golden, 2013). In terms of job creation, numerous urban agriculture projects provide community members with the opportunity for training and employment. Examination of UA projects, funded by the United States Department of Agriculture (USDA), found that such ventures provided approximately 2,300 jobs and incubated more than 3,600 micro-businesses (Kobayashi et al., 2010 as found in Golden, 2013). Many of these projects seek to employ youth to manage the gardens and others provide monetary stipends along with formal training (Metcalf & Widener, 2011 as found in Golden 2013).

Farmers markets provide ideal locations for small farm businesses, offering a safe and controlled space with low-risk and a flexible environment (Bregendahl & Flora, 2007; Freenstra & Lewis 199 as found in Golden, 2013). The growing and selling of produce locally stimulates local economies (Halweil, 2004). Money spent at community farmer's markets and shops cycles through the community creating employment and raising local incomes (Halweil, 2004). This is

supported by a computed scenario study in Michigan (Conner et al., 2008 as found in Golden, 2013). The scenario found that if homegrown fruits and vegetables were supported and sold locally such ventures would lead to the creation of an estimated 1,800 jobs along with $211.5 billion in income (Conner et al., 2008 as found in Golden, 2013). A similar planning study scenario conducted for a small region in British Columbia forecasted that urban farms in the area have the potential to develop 26 local jobs with a corresponding $2.39 million in revenue for farmers if government support and management were provided (Moreau & Hodgson, 2012 as found in Golden, 2013). These simulations depict hypothetical economic gains as UA in North America appears to be more value driven than economically motivated (Shinew, Glover & Parry, 2004). However, the existence of these scenarios is important as they allude to how many North American communities are looking to alternative food production methods for future sustainability measures (Vancouver Island Community Research Alliance, 2011)

UA's economic and employment potential stems from its place within a niche market. The harvests from UA are sold to a combination of restaurants, farmers markets, and consumers dedicated to buying fresh locally grown produce (Lander, 2011; Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011). Compared to rural agriculturalists, urban agriculturalists are at a market advantage as the dense population of cities provides a captive purchasing market (Lander, 2011). These captive markets allow urban farmers to shorten supply chains by selling directly to consumers allowing for potentially higher profits (Lander, 2011). Furthermore, urban farmers within North American cities have the advantages of utilizing existing urban infrastructure and water supplies, accessing vacant urban land, and have the luxury of fewer pests compared to rural environments (Lander, 2011). These all translate into economic benefits and serve to make UA an attractive venture for supplementing incomes and urban food supply chains.

Although the above simulations depict great earning potential for UA products, some municipalities' public health regulations can limit urban farmers ability to sell homegrown produce (Respondent 5). Such regulations reduce the earning power of urban farmers further marginalizing economic motivations. Therefore, in order to make UA more economically attractive modifications to health regulations prohibiting the sale of products will be necessary.

2. Financial Savings on Food Purchases:

An important aspect of UA is its potential to reduce participants' and wider-communities' household food bills (Golden, 2013; Fairholm, 1998). Regardless of participants' motivations i.e. leisure, economic, environmental, or social; urban farmers have noted cost savings stemming from participation (Shinew, Glover & Parry, 2004; Respondent 4; Respondent 5; Respondent 6). In Toronto, Ontario, survey responses revealed that the average community garden (~3000 Sq. Ft.) can produce ~9500lbs of food per growing season (spanning four- to – six months) amounting to approximately $12,000 in food savings annually for members (Respondent 1). Thus, due to market sale restrictions much of the economic gains arise from food cost savings rather than sales.

Urban agricultural programs that participate in local farmers markets have also been found to promote food savings amongst the larger community (Fairholm, 1998). These food savings have been noted in areas characterized as food-desserts which have limited access to cheaply priced quality food products (Golden, 2013; Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011). Within these areas the presence of farmers markets provide residents with access to affordable nutritious produces that are largely unavailable or financially inaccessible at local corner and grocery stores (Golden, 2013; Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011).

3. Cost Savings for Municipal Agencies:

The post-industrial landscape of many North American cities is characterized by vacant and/ or abandoned lots. Management of these spaces is costly to municipalities and are vulnerable to vandalism. The conversion of these areas to plots used for urban agriculture has allowed many municipalities to reduce maintenance spending across cities (Golden, 2013).

4. Increased Neighbourhood Property Values:

Many municipal food projects target low income groups with the establishment of community gardens in neighbourhoods characterized by low-income and high unemployment (Toronto. Deputy City Manager, 2013). Such targeted placement provides marginalized groups with alternative income streams and improves access to nutritious foods. The presence of these

urban gardens and farms has also been found to increase neighbourhood property values (Golden, 2013). One examination of local real-estate found that urban gardens contributed to raising property values by 9.4% over the course of five years (Voicu & Been, 2008 as found in Golden, 2013). Similarly, tax revenues from the increased property values over the span of twenty years were estimated to be half a million dollars per garden (Voicu & Been, 2008 as found in Golden, 2013). This tax revenue increase provides municipalities with strong returns on investment making them an attractive venture. However, it is important to realize that increases in property values can result in gentrification, in which low-income residents are phased out of their neighbourhoods due to the rising costs (Respondent 2).

Gentrification is a potential risk of introducing community gardens within low-income neighbourhoods (Ilyniak, 2013). UA can challenge gentrification; however, this is dependent on the inclusiveness of the socio-cultural dialogue within the Alternative Food Movement (AFM) (Ilyniak, 2013). Presently the AFM of many North America municipalities have been criticized for their exclusivity, ignoring minority and low-income voices (Hall, 2011). Such criticism construct the movement as invoking 'missionary impulses', attempting to teach low-income and minority groups about proper food production and consumption, rather than promoting an open dialogue (Guthman, 2008). This framework is dangerous as it alienates or even co-opts the local cultures, constructing white middle- income populations experience as the norm (Ilyniak, 2013). These criticisms of UA, and more largely the AFM, are linked to broader discussions of race and class within the context of food knowledge and thus food security i.e. who has the opportunity to participate in UA? And who can afford nutrient rich foods? (Ilyniak, 2013).

Although low-income members participate in UA for reasons of income supplementation (Interview Rhonda; Shinew, Glover & Parry, 2004); in North America such activities have become increasingly popular amongst middle income groups excited about local food production (Smith, 2012; Ilyniak, 2013). The increasing popularity has made UA activities more regimented and expensive; and thus, more difficult for low-income groups to access as many lack the necessary time and resources (Smith, 2012; Ilyniak, 2013). For example, within the municipality of Toronto, Ontario, members of allotment gardens are required to pay fees (Toronto. Parks, Forest &Recreation, 2014). Although these fees are marginal, low-income participants may be excluded from participation based on the cost in addition to seeds and gardening resources.

Additionally, bloggers have expressed how the process to obtain a garden plot can be an arduous and a time consuming process (Toronto Allotment Gardening and Beyond, n.d.). Such long processes may further deter low-income individuals with less discretionary time.

So how can the exclusionary white-middle class dialogue of the AFM be overcome? And how can the dangers of gentrification be avoided? Hall states that the AFM should learn from the Environmental Justice Movement by working in collaboration with minority and low-income groups it seeks to help; rather than structurally imposing white-middle class values (2011). By doing so, the movement will become inclusive and produce meaningful change (Hall, 2011). Within Toronto, the UA organization, Afri-Can Food Basket exemplifies how minority groups are reframing the AFM dialogue to incorporate the needs of immigrant and low-income groups (Respondent 6). Efforts made by the Afri-Can Food Basket have increased these groups access to garden plots and resources; as well as promoted community food-security (Respondent 6). The continuation of such movements, coupled with policy support from local governments will greatly assist in broadening the AFM scope and outreach.

In low-income developing nations, urban farmers appear to be more strongly motivated by economic benefits. As previously mentioned an estimated 200 million urban dwellers produce food-stuffs for local markets accounting for 15-20% of the global food production (Cohen & Garrett, 2010). This impressive amount of urban participation in agricultural activities eludes to its importance within the informal sector. UA provides community wide socio-economic benefits as both participants and non-participants experience increased accessibility to affordable nutritious foods. The reasons for involvement and the corresponding economic consequences of participation vary across different categories of households. A defining feature of UA is the socio-economic diversity of its participants and their corresponding incomes and livelihood schemes (van Veenhuizen, 2006). The four categories of urban agriculturalist within developing cities that have emerged through research are:

1. Subsistence home intra-urban farmers (intra-urban and peri-urban areas)
2. Family-type commercial farmers (intra-urban and peri-urban areas)
3. Urban and peri-urban agricultural entrepreneurs (intra-urban and peri-urban areas).
4. Multi-cropping peri-urban farmers (peri-urban areas)

(van Veenhuizen, 2006; De Bon, Parrot & Moustier, 2010)

These socio-economic profiles examine involvement from necessity rather than those of leisure, environmental stewardship, and social activism common to developed nations. The profiles are not exclusive to any one nation and are useful in determining the true economic benefit of UA within developing countries, given the highly diversified nature of urban agriculturalists. It is however important to remember that these categories are only guides, thus differences amongst them exist globally (van Veenhuizen, 2006). The following table provides information on the economic motivations and benefits of these four categories:

Table 1: Summary of socio-economic profile typologies

	Home Subsistence farmers	**Family-type commercial farmers**	**Entrepreneurs**	**Multicropping peri-urban farmers**
Location	Intra-urban and peri-urban	Intra- urban and peri-urban	Intra- urban & peri-urban	Peri-urban
Outlets	Home	Urban Market	Urban market & export	Home & Urban market
Objective	Home Consumption	Income for subsistence	Additional income Leisure	Home Consumption and income for subsistence
Size	Usually <100m2	Usually <1000m2	Usually >2000m2	Usually>5000m2
Products	Leafy vegetables, cassava, plantain, maize, rice, goats, and sheeps, poultry, fruits	Leafy vegetables, temperate vegetables, poultry (sheep) (milk)	Temperate vegetables, fruits, poultry, livestock, fish	Staple food crops, local vegetables
Intensification (inputs/ ha)	2	2 to 3	4	1
Gender	F	F+M	M	F+M
Limiting factor	Size	Size, land insecurity, access to inputs, water and services, marketing risks	Technical expertise, marketing risks	Access to inputs Fertility

(van Veenhuizen, 2006, p. 176; De Bon, Parrot & Moustier, 2010, p. 24)

The above table illustrates UA's socio-economic importance within different groups. The table also illustrates how income generation and household subsistence are the main motivators behind UA participation. The wage associated with UA is generally comparable to that of an unskilled construction worker and in some cities greater than mid-level civil servants (Mougeot, 2005). Income and savings generated from UA comes from urban farmers reduced food bills, as well as, proceeds from the sale of excess harvest (Mougeot, 2005). The income generated differs between the four typologies and is largely dependent on the size of the operations and location.

However, over all four categories UA has shown to contribute to the improvement of household economic wellbeing (van Veenhuizen, 2006; De Bon, Parrot & Moustier, 2010).

In terms of evolving from one typology to the next, researchers have found that 'home-subsistence farmers' and 'family-commercial farmers' find it difficult to move to the next level due to a lack of capital and land size constraints (van Veenhuizen, 2006). Support from local governments would assist in providing UA with legitimacy and in-turn increase urban farmer's access to capital and land security (Cabannes, 2012).

A study conducted in the late 1990's examined the presence of UA within 24 countries around the world (Mougeot, 2005). The study found that UA represents a substantial source of income generation and employment opportunities for diverse groups of urban residents (Mougeot, 2005). This section supports these findings as UA does provide economic benefits for cities of developed and developing nations. However, just as within the above Food-(In) security section, temporal and scale differences exist between the economic motivations of UA present in affluent cities and those present in low-income cities. Within low-income developing cities, economic benefits are the main motivators for participation within UA. The prominence of these economic drivers is due to immediate and wide-spread nutrient needs of the communities. Although, similar economic benefits are experienced by urban-farmers and communities of affluent developed cities, they are constructed within a food movement seeking future alternatives to the existing global food market. This is not to say that UA is not used by low-income groups, food banks, and charities as a means of subsistence; but only that these economic motivations are not the central driving force behind UA activities within affluent countries.

The following section will present UA's social benefits and motivations to engage in UA activities within developed and developing countries. This discussion will provide further insight into UA's global benefits, while also presenting potential risks of such practices which must be mitigated.

2.4.3. Urban Agriculture's Social Benefits/ Motivations

Urban agriculture's global presence has proven to yield far reaching social benefits for participants and non-participants. The major social benefits of UA are improvements to urban dwellers' health (particularly the urban poor) and the strengthening of community bonds through

participation and landscape rejuvenation. The following will discuss how UA promotes social well-being in both developing and developed countries by examining its role in improving individual nutritional, mental, and physical health; as well as, its contribution to community building and strengthening. Potential health risks related to UA will also be identified in order to understand why some municipalities are hesitant to formally incorporate its activities within their urban landscapes.

Nutrition Security and Overall Health:

Through a review of the relevant literature, it becomes apparent that urban residents around the world are facing a food crisis market by the overconsumption of unhealthy foods, inadequate access to fresh nutritious food products, and a diminishing bond between food producers and consumers (Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011; Halaweil 2004; Finely, 2013). Globally, this food crisis is propelled by urban poor's limited financial capital, increasing oil and food prices, inadequate food markets, climate change, governments overreliance on pre-packaged food imports, and governments promotion of policies favouring cash crops for export (Mougeot, 2005; van Veenhuizen, 2006; Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011). Urban agriculturalists are thus motivated not only by the economic benefits of such ventures, but also by the desire to produce and consume nutritious foods which may otherwise be unavailable (Simatele & Binns, 2008; World Commission on Environment and Development, 1987; Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011). The production and consumption of nutritious foods has proven to lead to better nutritional health, mental health, physical health, and overall we-being (Bellows, Brown & Smit, n.d.).

Within affluent developed countries it has been debated whether poor nutritional health, amongst urban populations, is a consequence of limited 'access' or rather a problem of food knowledge and/ or taste (Guthman, 2008). Nutritious foods are available within grocery stores of affluent cities; however, there is a difference between 'availability' and 'access' (Lang, n.d.). Although healthy foods are available for purchase, urban poor (many graduate students included) do not have the financial means to purchase such products. Lack of monetary resources inevitably push low-income consumers to select cheaper and often less nutritious options to satisfy immediate hunger, but which do not provide necessary nutrients (Hoover, 2013). This

being said, food knowledge and taste does also play a role in consumers food selections. The Alternative Food Movement (AFM) attempts to overcome the issue of food 'access' within low-income neighbourhoods by introducing community gardens and farmers markets (Guthman, 2008; Hoover, 2013). This has been a contentious practice, criticized for reflecting the desires of its white- middle class creators more than those of the community in which they serve (Guthman, 2008; Hoover, 2013). Field-work projects undertaken by Guthman's Community Studies students, from the University of California at Santa Cruz (UCSC), substantiated this claim highlighting issues of taste and presupposed notions of what people should eat as barriers to low-income group's consumption of healthy foods (2008). The students' field-work revealed that even when fresh fruits and vegetables where accessible at below market prices, many low-income minority groups did not purchase them for reasons of taste and unfamiliarity (Guthman, 2008).These findings show deeper structural issues imbedded in racial experiences and food values. Thus, to tackle problems of food-insecurity amongst low-income minority groups, AFM projects must confront issues of access in conjunction with the larger structural challenges grounded in racial experience and histories.

Nutritional Health:

Globally, urban agriculture has contributed to nutrition improvements and poverty alleviation amongst the urban poor. These developments have arisen from improved access to fresh food products, contributing to overall increases in daily caloric intakes (Timmer, 1995). UA's contribution is exemplified with a study conducted in Malawi, finding that 17% of the countries food entitlements are produced by UA (Redwood, 2009). Further, Malawi households that practice UA are able to meet 76% of their daily food requirements; where those which do not, meet 65% of their daily food requirements (Redwood, 2009). When well-tended, over 130-days one 10x10 plot can produce enough vegetables to satisfy almost all of a households yearly vegetable needs; including a large share of nutritional requirements for Vitamin A, B, and C (Bellows, Brown & Smit, n.d).

An increasing number of urban residents within the post-industrial city of Detroit, experiencing cataclysmic socio-economic challenges, are relying on urban agriculture to satisfy their nutritional needs (Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011). When urban populations reside in food desserts (largely in post-industrial cities of North America)

and/or spend 50%-70% of their income on groceries, cultivating one's own food becomes attractive and necessary to meet dietary requirements (Finley, 2013; Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011; World Commission on Environment and Development, 1987). Although many Detroit residents have turned to UA as a coping mechanism, the Urban Roots documentary, revealed that some people have moved to Detroit to participate in UA as a lifestyle choice, rather than for necessity (Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011). These participants can be characterized as members of the middle-class AFM who are seeking to reclaim connections between food production and consumption, rejecting global food markets.

Regardless of motivations, on both the individual and community scale the presence of urban garden plots and markets selling affordable fresh fruits and vegetables have reconnected producers and consumers (Bellows, Brown & Smit, n.d). This reconnection increases local knowledge of food and creates positive repercussions for dietary habits in both developing and developed countries (Bellows, Brown & Smit, n.d; Halweil, 2004).

The concept of 'food knowledge' is important to the food movement in North America. The integration of UA into neighbourhoods and school yards of affluent cities has been used as a tool to promote nutritional health education (Toronto. Food Policy Council, 2012). Youth's involvement in UA is used as an educational tool to sensitize children to dietary questions and food production. The education component of UA is important to the Alternative Food Movement as lack of knowledge is viewed as a barrier to nutritional health and food-insecurity (Guthman, 2008).

Mental Health:

It is well known that urban environments (especially those in the global North possessing strong notions of individualism) can often leave people feeling disconnected from others, leading to feelings of isolation and mental health issues. Urban agriculture has been found to greatly benefit mental health and overall feelings of wellness as it provides urban dwellers with the opportunity to work with plants and animals outdoors (Simson &Straus, 1998; Halweil, 2004). Horticulture therapy in North America and Europe provides people of all ages and backgrounds with the opportunity to improve self-esteem, and relieve stress through agricultural work

(Bellows, Brown & Smit, n.d). This work also provides participants with a sense of accomplishment as they are contributing to the common good through food production.

Physical Health:

Food production has been noted as an excellent form of exercise. The exercise involved in urban agricultural activities ranges from fine motor skills during weeding and trimming to aerobic gross motor tasks during the turning of compost piles and clearing (Bellows, Brown & Smit, n.d). These activities are different from traditional urban work which tends to be less physically involved and sedentary.

Contribution to Community Building:

Intimately linked to UA's ability to promote overall social health, is its capability to facilitate community building. UA accomplishes this through two main avenues: 1) encouraging social and economic integration and inclusion of marginalized groups and 2) increasing feelings of safety and security through the transformation of city landscapes.

Inclusion and Integration of Marginalized Groups:

The nature of urban agricultures work characterized by low start-up costs and limited required skills, allows for the participation of marginalized groups such as: the urban poor, unemployed, elderly, disabled, refugees, female headed households, etc (Dubbeling, de Zeeuw & van Veenhuizen, 2010; van Veenhuizen, 2006; Viljoen, 2008). The inclusive nature of urban agriculture is present in both developed and developing nations and makes it unique from other urban employment which tends to require more specialized skilled labour. Participation in UA provides these individuals not only with a potential source of income, but also with: encouragement, a sense of purpose, pride, therapeutic activity, new skills, self-confidence, and increased feelings of security (Dubbeling, de Zeeuw & van Veenhuizen, 2010; van Veenhuizen, 2006; Viljeon, 2008). Although the AFM has been criticized for unintentionally excluding non-white participants with its white hegemonic dialogue (Hoover, 2013); as mentioned earlier organizations such as the Afri-Can Food Basket in Toronto have incorporated minority voices and successfully encouraged participation of new immigrants and minority groups (Respondent 6).

NGO's and community groups around the world have used urban agriculture programs as a means for integrating disenfranchised and at risk populations into mainstream society. In Nakuru Kenya, various non-profit and community groups have established urban gardening programs as a means to improve the diets and strengthen the ties of local residence who have been effected by HIV/AIDS (van Veehuizen, 2006). The gardening programs have proven successful in providing social and economic support to Nakuru's community members who have been marginalized due to their illness.

Similarly, in Roxbury and Dorchester, Boston, various non-profit organizations have established community gardens within disenfranchised neighbourhoods as a way to targeted at at-risk youth, encourage healthy lifestyles, foster community strengthening, and contribute to crime alleviation (van Veehuizen, 2006). These programs promote individual development and offer members an avenue to fully participate in mainstream society by providing them with increased access to much needed resources.

Transforming City Landscapes:

Urban landscapes tend to have limited natural features. In post-industrial cities of North America, urban landscapes are characterized by large impervious surfaces along with vacant and abandoned lots (Knizhnik, 2012). These underused vacant spaces attract criminal activity and vandalism reducing societal feelings of safety and security (Jacobs,1961). However, the introduction of urban agriculture and greening in these areas has proven to decrease crime, increase property values, and promote societal feelings of safety and security (Schmid, Petersen, Maclnnis, Zimmerman, & Fitzpatrick, 2011; van Veenhuizen, 2006; Halwiel, 2004). This is further supported by a survey conducted in over 60 community gardens in upstate New York, finding that urban farms improved property maintenance, reduced littering, and increased neighbourhood pride (Halweil, 2004).

Urban agriculture is a public good as it improves cities landscapes with the introduction of natural features. These improvements benefit all community members by increasing inhabitant's safety and overall health. The integration of natural features within concrete jungles exposes urbanites to natural environments close to home, while at the same time increasing cities biodiversity and ecological health (Lin & Fuller, 2013).

Potential Health Risks of UA:

The multifaceted social benefits of urban agriculture make it difficult to comprehend why many municipalities still prohibit its practices. It is undeniable that improved access to fresh foods positively impact community health (van Veenhuizen, 2006). However, despite UA's noted successes, potential health risks associated with unregulated urban agriculture activities have be identified (van Veenhuizen, 2006). These identified risks provide much needed insight and help explain why some municipalities lack formal recognition of UA activities. The health risks identified are grouped into the following categories:

Table 2: Potential Health Risks of Urban Agriculture

Contamination of crops with pathogenic organisms as a result of irrigation with water from polluted streams and insufficient treated wastewater or unhygienic handling of the products during transport, processing and marketing of fresh products;
Spread of certain human diseases by mosquitoes and scavenging animals attracted by agricultural activities;
Contamination of crops due to prolonged intensive use of agrochemicals;
Contamination of soils and products with heavy metals due to traffic emissions and industrial effluents;
Certain diseases transmitted to humans by keeping livestock in close proximity without proper precautions being taken.

(van Veenhuizen, 2006 p.4)

Like all industries, urban agriculture presents potential health risks. However, formal recognition of urban agricultural practices by local governments, planners, and policy makers would mitigate these threats and provide the appropriate regulations and monitoring systems (van Veenhuizen, 2006; de Bon, Parrot & Moustier, 2009). This recognition would allow UA practices which benefit community health and safety to prosper, while preventing its potential health risks.

The social benefits of urban agriculture are far reaching. The documented importance of urban agriculture for overall community health, and social cohesion globally illustrates its centrality to urban growth and sustainability. The next section will present the environmental benefits and motivations of urban agriculture and will demonstrate how UA practices can lead to a more sustainable urban environment.

2.4.4. Urban Agriculture's Environmental Benefits/ Motivations

The physical expansion of cities stemming from urbanization has led to environmental transformations. In order to protect surrounding environments from pronounced urban growth and improve the ecology of cities, creative and forward thinking city planning is needed. The following section is concerned with how urban spaces can incorporate natural features, namely urban agriculture, to foster sustainable urban growth. In order to frame the issue for readers, the section will begin by examining urbanization's pressures on arable land. The discussion will then progress into a presentation of UA's environmental benefits with a close look at its ability to metabolize urban waste and encourage rejuvenation of urban landscape; followed by a discussion of its potential environmental risks, highlighting the importance of UA policy and regulations. Overall this section will illustrate how UA can play a role in producing truly sustainable cities when accompanied by formal regulations and policies.

Global Loss of Arable Land to Urban Land Uses:

Throughout history, cities have been constructed in close proximity to agricultural areas, as this immediacy provided urban dwellers with steady food supplies. In the 21st century, intense urbanization has brought with it development pressures, contributing to the global loss of arable land through urban expansion (Liu, Wang & Long, 2010; Hanson, Hendrickson & Archer, 2008). These urban growth trends have been found to affect agricultural productivity in two main ways, firstly, by reducing the availability of arable land and secondly, by reducing the number of rural agricultural workers (De Bon, Parrot & Moustier, 2010). Presently, the United States is having increased difficulty maintaining sustainable agriculture systems, as large parcels of agriculture lands are being converted for urban uses (Hanson, Hendrickson & Archer, 2008). The problem is further confounded by a net reduction in agricultural workers, as more farmers are migrating to cities in search of off-farm work and less people are choosing to enter into the agricultural profession (Hanson, Hendrickson & Archer, 2008; Parés-Ramos, Gould & Aide, 2008). Similarly, in Mexico, China, and Puerto Rico, increase urbanization is positively correlated with a decrease in agricultural lands (Torres-Lima, Rodríguez-Sánchez, 2008; Liu, Wang & Long, 2010;Parés-Ramos, Gould & Aide, 2008). The conversion of arable land to urban uses is of concern as such transitions are extremely difficult to reverse (Hanson, Hendrickson & Archer, 2008).

Along with urbanization, de-urbanization is negatively impacting agricultural lands and their production. De-urbanization occurs when populations migrate from cities to surrounding suburbs and rural agricultural areas to live. This population movement leads to the construction of residential lots within traditionally agricultural areas permanently transforming the landscape. Such transitions pose risks to agricultural production as the new residents generally do not cultivate the land, but rather commute to nearby city centres for employment (Parés-Ramos, Gould & Aide, 2008; Satterthwaite, McGranahan & Tacoli, 2010). The transformation of arable lands to residential uses through de-urbanization can produce social, economic, and environmental implications by permanently reducing the size of agricultural production areas and can also lead to conflicts between farmers and non-farmers over agricultural practices (Kremer, 2005; Sharp & Smith, 2003).

In a context where urbanization and de-urbanization are contributing to the loss of agricultural lands, peri-urban agriculture in Mexico City has been responsible for protecting the environmental landscape (Torres-Lima, Rodríguez-Sánchez, 2008). With the diminishing number of large agricultural farms in Mexico City, peri-urban agriculture has emerged in the shape of small diverse family farms producing food for household consumption and sale (Torres-Lima, Rodríguez-Sánchez, 2008). This regional crop production has been important to the local economy and residents (Torres-Lima, Rodríguez-Sánchez, 2008). Additionally, these peri-urban farms protect the heterogeneity of the landscape, use natural resources, and adapt to the macro-economic changes of the city (Torres-Lima, Rodríguez-Sánchez, 2008). Although intra- and peri-urban agriculture should be considered as a supplement for rural agriculture not a replacement, their promotion of a heterogeneous landscape is essential for the protection of environmental diversity needed to create sustainable cities (Lin & Fuller, 2013; Hanson, Hendrickson & Archer, 2008).

Urban Agriculture and the Recycling of Urban Organic Waste:

By the year 2050 the urban population is expected to increase by 2.6 billion people (Lin &Fuller, 2013). This rapid urban growth has outpaced developing countries' ability to provide necessary infrastructure such as sanitation and waste collection, culminating in a growing waste management problem (van Veenhuizen, 2006). The UN 2002 Human Development Report revealed that 2.4 billion people in developing nations lack access to basic sanitation (UN, 2002).

Urban areas generate large amounts of solid waste with one estimate being 0.6 kg / person/ day (VanVeenhuizen, 2006). On its own this waste has no value, however when used by urban agriculturalists it can produce valuable food products. The use of urban organic waste for urban agriculture can serve two important functions for urban dwellers: 1. It removes unwanted waste and 2. It is used to produces locally grown fresh food (vanVeehuizen, 2006).

Sustainable management of solid waste is a growing challenge faced by municipalities of developed and developing nations (vanVeehuizen, 2006). Urban agriculture can assist in managing this problem as it composts the organic waste and recycles the materials to condition and replenish soils. A report compiled by Zurbrugg abd Drescher (2002) found that such actions produce benefits for: waste reduction, organic waste recycling, replenishment of arable soils, and reducing the environmental impact of disposal sites. Hoornweg, Thomas & Otten (1999) categorized the social and environmental benefits of recycling urban organic waste as follows:

Table 3: Benefits of Recycling Urban Organic Waste

Increases overall waste diversion from final disposal, especially since as much as 80% of the waste stream in low-and middle-income countries can be composted ;
Enhances recycling and incineration operations by removing organic matter from the waste stream;
Produces a valuable soil amendment-integral to sustainable agriculture;
Promotes environmentally- sound practices, such as the reduction of methane generation at landfills;
Enhances the effectiveness of fertilizer application;
Can reduce waste transportation requirements;
Is flexible for implementation at different levels, from household efforts to large-scale centralized facilities;
Can be started with very little capital and operating costs;
The climate of many developing countries is optimum for composting;
Addresses significant health impacts resulting from organic waste such as reducing Dengue Fever;
Provides an excellent opportunity to improve a city's overall waste collection program;
Accommodates seasonal waste fluctuations such as leaf litter and crop residues;
Can integrate existing informal sector involved in the collection, separation and recycling of waste.

(Hoornweg, Thomas & Otten ,1999, p.4)

In addition to benefits, potential risks were also identified by Hoornweg, Thomas & Otten (1999) and categorized as follows:

Table 4: Potential Risks of Recycling Urban Organic Waste

Inadequate attention to the biological processing requirements;
Over-emphasis placed on mechanized processes rather than labour-intensive operations;
Lack of vision and marketing plans for final product- compost;
Poor feed stock which yields poor quality of finished compost, for example when contaminated by heavy metals;

Poor accounting practices which neglect that the economics of composting rely on externalities, such as reduced soil erosion, water contamination, climate change, and avoided disposal costs;
Difficulties in securing finances since the revenue generated from the sale of compost will rarely cover processing, transportation and application costs.

(Hoornweg, Thomas & Otten, 1999, p.4)

Local leaders, urban planners, and policy makers play a central role in the successful management of this nutrient recycling loop (urban consumption-waste processing-economic viability, marketability and distribution- compost demand for food production) (vanVeehuizen, 2006). Proper regulations and management can assist in the successful recycling of urban organic waste and will benefit municipalities by reducing waste disposal costs and contamination (vanVeehuizen, 2006). Urban agriculture can be an asset to both developing and developed countries by helping cities recycle their organic waste, reduce solid waste disposal, and reduce transportation costs of compost and food products (World Commission on Environment and Development, 1987; Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011).

Urban Agricultures Potential for Improving Cities Ecology and Landscapes:

Compared to rural settings, cities face unique environmental challenges as a result of their dense development and spatial patterning. In regards to biochemical conditions and processes, dense development causes ecological systems to behave differently than they would in natural environments (Knizhnik, 2012). A major environmental challenge for urban centres is the phenomena of heat islands[5], increasing storm-water runoff especially within post-industrial cities possessing unique development patterns (Knizhnik, 2012).

Storm-water runoff is a serious environmental concern within urban centres as most of cities surfaces are impervious (Knizhnik, 2012). Impervious surfaces cause excessive water runoff which can lead to health concerns stemming from water contamination and flooding of residential areas (Knizhnik, 2012). Roof-tops and vacant lots within cities account for the greatest percentage of these impervious surfaces. As a means of reducing storm-water runoff the introduction of green-roofs and UA on vacant and abandoned lots have been used to improve the ecology of cities (Knizhnik, 2012). Green-roofs and urban agriculture accomplish this by creating permeable surfaces which absorb the excess water (Knizhnik, 2012).

[5] Heat islands are a phenomenon in which urban air and surface temperatures are higher than rural counterparts.

Post-industrial cities of North America possess unique ecologies and landscapes. Post-industrial is a term used to describe cities that successfully industrialized and expanded during the Industrial Era but later experienced a major economic shift when manufacturing moved to other locations. With the loss of manufacturing, the service sector became the primary source of economic productivity. This economic shift brought with it social, economic, and environmental challenges. Detroit, Michigan and Philadelphia, Pennsylvania are two examples of post-765industrial cities which have experienced severe population declines, fiscal deficits, rising crime rates, and environmental distresses (Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011; Knizhnik, 2012).

The industrial histories of Detroit and Philadelphia, have left much of their urban landscapes contaminated by pollutants; most commonly petroleum, pesticides, lead, and other heavy metals (Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011). Therefore, before urban agriculture can occur environmental remediation must first take place. Soil remediation is an expensive and time consuming process but is a necessary step in reversing industrializations environmental degradation. In some situations, a plant-based engineering technology known as soil phytoremediation[6] can be used to reclaim contaminated soils (Cunningham & Berti, 1993). This plant-based remediation strategy offers the potential for cost-savings, as well as the restoration of sites through a comparatively noninvasive method (Cunningham & Berti, 1993). These plants are non-edible, however, they assist in greening previously industrial sites and offer a potential future location for safe UA activities. The integration of UA and green spaces within post-industrial cities does not only create economic, nutritional, and social benefits; but also, provides the opportunity to improve the ecology of cities leading to healthier living environments.

Urban Agricultures Potential Environmental Risks:

Along with environmental benefits, urban agriculture does present some environmental risks. Within developed and developing cities a major environmental concern lies in UA's potential to contaminate local water sources. Contamination can occur if high quantities of pesticides and chemical fertilizers are used (van Veenhuizen, 2006). However, use of harmful

[6] Phytoremediation is defined as "the use of green plants to remove, contain, or render harmless environmental contaminants" (Cunningham & Berti, 1993, p. 207).

pollutants can be prevented with the introduction of organic growing methods. The utilization of such methods would prohibit harmful chemicals from entering municipal water sources and benefit the cities overall ecology. In addition to water contamination, concerns over water scarcity have arisen within affluent and low-income cities (Stewart, Korth, Langer, Rafferty, Rebelo Da Silva & van Rooyen, 2013; Molle & Berkoff, 2009). In some areas where water scarcity is a concern, the allocation of scarce water resources to UA activities has become a contentious issue (Stewart, Korth, Langer, Rafferty, Rebelo Da Silva & van Rooyen, 2013). Water conflicts between agricultural and urban uses tends to be framed within the false notion that farmers misuse and waste water resources (Molle & Berkoff, 2009). Research into agricultural water resources have revealed that farmers do not misuse water resources and argue that such allocations are based in arguments to support de-investment in agricultural practices (Molle & Beroff, 2009).

In developing cities, often possessing less restrictive zoning regulations, concern has arisen over UA taking place within sensitive ecosystems; such as wetlands and hillsides (van Veenhuizn, 2006). Given UA's marginalization within many municipalities of developing cities, urban farmers have sought more secluded locations. However, UA practices within these fragile ecosystems can produce harmful ecological effects if not properly kept (vanVeenhuizen, 2006). Additionally, within many developing nations there is concern over UA's potential to increase the presence of malaria and dengue fever (Stewart, Korth, Langer, Rafferty, Rebelo Da Silva & van Rooyen, 2013). This concern arises from the fact that UA plots can be breading grounds for mosquitoes, which carry and spread these diseases to populations (Stewart, Korth, Langer, Rafferty, Rebelo Da Silva & van Rooyen, 2013). Such concerns are valid; however, formal recognition of UA practices can mitigate these risks with proper regulations and monitoring systems.

This being said, it is important to keep in mind that traditional agriculture production is not free from environmental damage or risk. For example, agricultural runoff is one of the world's most destructive sources of pollution (Despommier, 2010). Globally, over the past 20 years estuaries[7] have become contaminated by millions of tons of runoff containing silt, pesticides, herbicides, and nitrogen fertilizers (Despommier, 2010). This contamination has led

[7] Estuaries are the point where rivers enter the ocean and which are highly productive aquatic environments.

to the sterilization of a high proportion of the world's most important estuaries (Despommier, 2010). Furthermore, nitrogen fertilizers (ammonium nitrate and urea) have been found responsible for the killing off hundreds of billions of immature crustaceans, mollusks, and fish as their entry into water systems greatly reduces oxygen levels (Despommier, 2010). This environmental crisis has forced the United States to import over 80% of its seafood each year (Despommier, 2010).

Both urban and rural agriculture have the potential to produce harmful environmental effects. Thus, in order to protect our food sources, as well as our natural environments, farmers of all kinds must practice safe farming by ensuring their activities are line with recognized regulations and guidelines.

Urban Agriculture's Role in Producing Truly Sustainable Cities:

Sustainable systems require diversity and adaptability. Traditionally, cities have been characterized by a lack of biodiversity with natural features removed in favour of built-up form. As discussed above, urban centres overwhelming impervious surfaces and lack of natural features have caused environmental challenges for post-industrial cities. Therefore, when re-designing post-industrial cities and cities within developing nations, plans should incorporate natural features. The inclusion of natural systems within urban spaces produce a number of socio-ecological benefits as urban green space in the form of agriculture, vegetation, street trees, parks, and wetlands provide micro-climate regulation systems for urban heat islands, and increase biodiversity for improved environmental and human health (Lin &Fuller, 2013).

UA's diverse crops provide ecological benefits and assists in reducing the environmental footprint caused by traditional monoculture (Hanson, Hendrickson & Archer, 2008). Including UA's diverse cropping systems within urban centres can help reduce environmental degradation within developed and developing nations, while at the same time increase the biodiversity of global cities leading to the creation of sustainable urban environments.

Part 3: Urban Agriculture Case Studies: A Closer Look within North America and Africa

This section offers a closer look at intra- urban agriculture in practice within the North American city of Toronto, Canada and the African city of Kampala, Uganda. Although historically, geographically, culturally, and economically different, both cities have accepted and encouraged agricultural practices within their populated urban centres. This acceptance and formal recognition have come in the form of municipal policies, ordinances, and plans recognizing urban agricultures ability to increase urban food security and produce far reaching social, environmental, and economic benefits. Being global leaders in urban agriculture policy and practice, Toronto and Kampala are ideal selections for case study review. This section will examine how urban agriculture activities in Toronto and Kampala contribute to food security amongst its residents. The purpose of this examination is to determine whether or not intra-urban agriculture indeed has the capacity to increase food security or not, and to identify the current and future conditions required to realize this food security objective.

3.1. North America

The process of urbanization continues to be a global phenomenon, with more people residing in urban centres than ever before. In North America, early industrial capitalism of the late 19th century spurred population growth of urban centres, as local and national economies shifted from a rural to an urban market focus (Katz, Doucet, & Stern, 1982). Since the 19th century, urbanization has continued with its growth rate remaining closely tied to national income and economic growth (UN, 2013). In Canada as of the year 2010, 81% of the total population resided in urban centres as defined by national statistics offices, with an average 1.1% annual rate of change (World Fact Book, 2014).

Throughout North America there has been a noticeable rise in the number of urban residents participating in urban agricultural activities; though the infrastructure and formal recognition of such practices greatly vary between municipalities (Bhatt & Kongshaug, 2005). Individual and group motivations for participation differ and include issues related to: food and income security, leisure and recreation, as well as social and political activism. Discussions around food security are generally related to developing countries facing rapid urbanization, eroding social and economic infrastructure, national overreliance on cash crops, and breakdown of import- export systems (Bhatt & Kongshaug, 2005). However, North American post-industrial

cities are not immune to food insecurity as many are heavily reliant upon food imports (intimately linking food prices to oil and transport costs) and possess areas defined as food deserts (predominantly within low-income neighbourhoods), in which residents have limited access to affordable nutritious foods (Schmid, Petersen, Maclnnis, Zimmerman, Fitzpatrick, 2011). These conditions have led to resurgence in urban agriculture as it provides the opportunity for much needed access to nutritious foods; as well as, the opportunity to supplement household incomes. UA's ability to promote food-security within communities is of particular interest to this report. The following section seeks to uncover UA's role within North American cities to determine if, and to what extent, intra-urban agricultural practices contribute to food-security amongst urban residents of developed countries. This discussion will also provide insight into intra-urban agricultures present and future place within North American developed communities.

Apart from food-security, many North American's participate in UA as a form of leisure and recreation (Shinew, Glover & Parry, 2004). Within this context members are motivated by non-food advantages of UA. Community gardens provide a safe place for people of different backgrounds, cultures, and socio-economic groups to meet, mingle, and strengthen community ties by working towards a single goal (Bhatt & Kongshaug, 2005; Shinew, Glover & Parry, 2004). Noted non-food benefits of UA participation are a reduction in stress, increase in physical exercise, enhanced employee productivity, and improvements to mental health (Bhatt & Kongshaug, 2005; Bellows, Brown & Smit, n.d; Simson &Straus, 1998; Halweil, 2004).

Additionally, there exists 'moral' and 'feel good' dimensions to the community gardening movement of North America. As mentioned earlier, the Alternative Food Movement (AFM) has a large white middle-class following motivated by urban food justice, individual and community health, environmental quality, and socio-environmental justice (Tornaghi, 2014). These groups, such as 'P-Patch' in Seattle, Washington, work to improve low-income and minority group's access to nutritious foods by constructing community gardens for food insecure populations in addition to challenging the inequalities embedded in the agri-food business and global food market, such as: health hazards, workers' rights, and environmental impacts (Tornaghi, 2014). These admirable motivations frame the UA movement as compassionate and unproblematic with the potential to solve urban issues related to: food quality and affordability, ecological footprints, community cohesion, community reliance, and urban sustainability

(Tornaghi, 2014). However, as previously mentioned concerns related to the strong middle-class values and 'whiteness' embedded within the food movement have raised questions related to its success (Slocum, 2007; Tornanghi, 2014).

In the United States, the process of establishing community gardens within minority and low-income neighbourhoods, as a means of increasing food access and knowledge, have been criticized as producing 'white spaces' within predominantly black and Latino neighbourhoods (Hoover, 2013). Such outcomes occur when white dominated practices enter communities with the goal of promoting food security, access, and education but are unaccompanied by local participation leading to unintended exclusion (Hoover, 2013). Critical race theory states the lack of visual and textual representation of minority groups within the AFM creates a hegemonic framework in which non-white agricultural histories and values are ignored (Hoover, 2013). Such a context is detrimental to the movement as it alienates the very groups it seeks to help.

To counter balance these white middle-class drivers, minority groups have been identified as co-opting the AFM and utilizing UA as a form of social activism. This is exemplified by the guerilla gardeners Finley speaks of in South Central L.A. (2013). These guerilla gardeners are local residents of low-income communities, volunteering their time to plant food on vacant lots as a means to increase food security within their neighbourhood (Finley, 2013). This homegrown movement began to reclaim the neighbourhood and combat rising obesity stemming from inadequate access to nutritious foods (Finley, 2013). Similarly, within the City of Toronto, a number of immigrant groups participate in UA as a way to grow culturally specific fruits and vegetables, enabling the representation of their home country within their new nation (Bhatt & Kongshaug, 2005; Respondent 5). Within this context UA has been utilized by minority groups as a means to celebrate cultural diversity and maintain traditional ties. Furthermore, such actions increase their access to traditional products which are either absent from the general market or too expensive (Bhatt & Kongshaug, 2005). From a political activist perspective urban agriculture provides a means for citizens to react to rising concerns related to food miles and the negative environmental outcomes of the global food market (Halweil, 2004). In this context, the growing and selling of food products locally is a statement against the unnecessary import of foods which can be grown locally naturally and a way of taking control over the foods we consume (Xuereb, 2005).

The food and non-food motivations leading to UA participation within North America provide a solid basis for why urban agriculture has reemerged within affluent developed nations. Urban agriculture, although not a new phenomenon, allows urbanites of the 21st century to reconnect with food production and improve social and environmental health. This report will focus on the occurrence of intra-urban agriculture for the purpose of increasing urbanites food security, allowing for better access to healthy and affordable products amongst low-income groups.

3.1.1. A Closer Look: Toronto, Ontario Canada:

Toronto is the provincial capital of Ontario and is Canada's most populated city home to 2,615,060 residents or 7.8% of Canada's total population, according to the 2011 census (Toronto. City Planning Department, 2012) The Greater Toronto Area (GTA), incorporating the city of Toronto and the four surrounding regional municipalities: Halton, Peel, York, and Durham is one of Canada's fastest growing regions with a projected population of 7.45 million by the year 2031; with Toronto's population rising to 3 million by the same year. Toronto is densely populated and located in Southern Ontario along the northwest shore of Lake Ontario at Latitude 43 39N, Longitude 79 23 W (Toronto. Land Information Department, Parks & Recreation Department, Natural Resources Canada Department, 2013). Located on a broad sloping plateau intersected by copious river valleys, the city of Toronto encompasses 641 sq. km extending 43 km from east to west and 21 km from north to south at its most distant points (Toronto. Land Information Department, Parks & Recreation Department, & Natural Resources Canada Department, 2013).

Map 1: Ontario, Canada

Map 2: Greater Toronto Area (GTA)

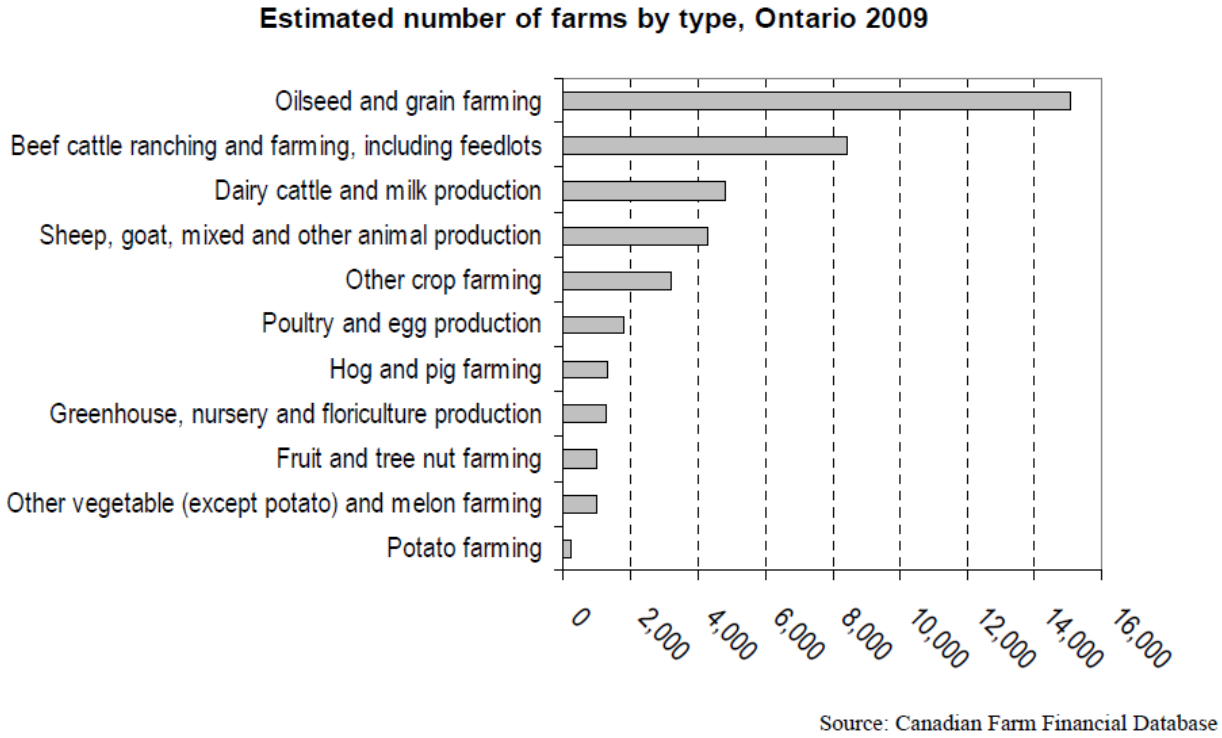
The post-industrial city of Toronto is Canada's economic and financial hub accounting for 19% of the country's GDP (Toronto. Economic Development & Culture, 2014). Toronto is home to Canada's Stock Exchange and five national banks making the financial service sector the main driving force behind the local and national economies (Toronto. Economic Development & Culture, 2014).

The city of Toronto is known for its diversity and multiculturalism with nearly half of its population immigrating from over 100 different countries (Toronto. City Planning Research, 1998). The Greater Toronto Area is Canada's most important immigrant destinations and is home to 43% of Canada's recent immigrants compared to 18% in Vancouver, 13% in Montreal, 4% in Ottawa, and 3% in Calgary (Toronto. City Planning Research, 1998). The city of Toronto alone has three times as many immigrants compared to the rest of Canada and four times as many recent immigrants, which are those who immigrated after 1990 (Toronto. City Planning Research, 1998). This diverse population makes Toronto an international hub and contributes to the city's vitality bringing new ideas, knowledge, cultural experiences, and strengthening connections to distant markets (Toronto. City Planning Research, 1998). The large immigrant

population has also been a great asset to the City's urban agriculture (UA) movement as many bring with them food-growing knowledge (Toronto. Food Policy Council, 2012). These groups' vast agricultural knowledge has introduced the cultivation of diverse crops within Toronto, improving local access to various ethnic products that would otherwise be unavailable or available at a high cost within local grocery stores (Toronto. Food Policy Council, 2012).

Like most North American regions, the agricultural sector has historically been an important contributor to Ontario's economy. Since the 1970's there has been a shift in farm structure marked by a shrinking number of farms and a simultaneous growth in farm size (National Farmers Union, 2011). Between the years 1921-to- 2006, 25,000 farms have been lost across the province (National Farmers Union, 2011). The main crops grown in this region (listed from most common to least common) are: grains and oilseeds, followed by beef cattle products, dairy, other animal products, along with a small numbers of farmers producing hogs, poultry, eggs, fruits, vegetables and potatoes (National Farmers Union, 2011). The following graph taken from the Canadian Farm Financial Database and cited by the National Farmers Union, 2011 provides a visual representation of what is produced by Ontario farmers.

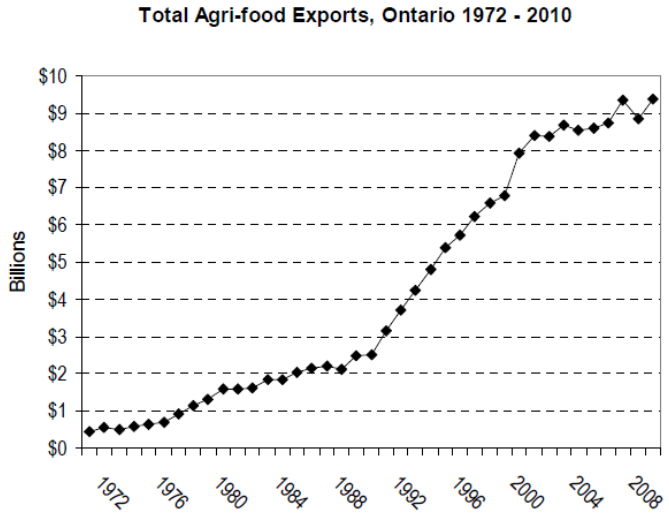
Figure 2: Estimated number of farms by type, Ontario 2009



(National Farmers Union, 2011, p.5)

Since the late 1970's Ontario's agricultural sector has become increasingly export-orientated. The following graph provided by Statistics Unit OMAFRA and cited by the National Farmers Union 2011, illustrates how exports have increased by nearly tenfold between the years 1972-to-2010.

Figure 3: Total Agri-food Exports, Ontario 1972-2010

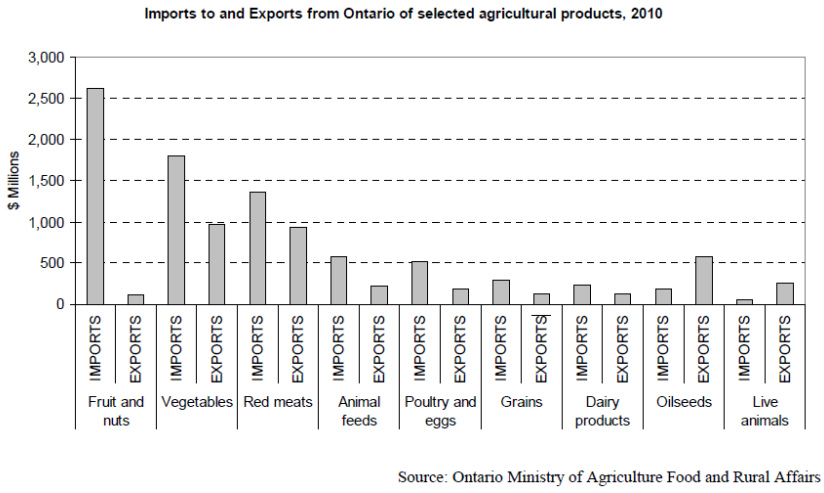


Source: International Trade Statistics, Statistics Canada Prepared by: Statistics Unit, OMAFRA

(National Farmers Union, 2011, p.6).

This export-oriented market has resulted in the increased quantity and diversity of imported food products. The products accounting for the largest dollar value of food imports are: fruits, vegetables, beverages and grain products (National Farmers Union, 2011). The Ontario Ministry of Agriculture Food and Rural Affairs provided the following chart comparing Ontario's food imports to its exports:

Figure 4: Imports to and Exports from Ontario of selected products, 2010



Source: Ontario Ministry of Agriculture Food and Rural Affairs

(National Farmers Union, 2011, p.6)

The above graph reveals that Ontario consumers, like the majority of North Americans, rely heavily on imported food products such as fruits, vegetables, and red meats. This is concerning as Xuereb's research examining Waterloo, Ontario, revealed that many of these fruit and vegetable products can be produced locally at a lesser transportation cost (2005). Furthermore, although food imports have traditionally been viewed within the global market as increasing food-security through geographic specialization overreliance on food imports can leave communities vulnerable to food insecurity. This insecurity stems from climate change and is exemplified by export regions such as California, Brazil, and Argentina, presently being affected by drought, as well as, China facing concerns of soil contamination (Feeding Nine Billion, 2014). Such realities place pressure on export/ import food systems and can cause insecurities within the global food market.

In conjunction with this structural shift, The Greater Toronto Area (GTA) is experiencing extensive urban sprawl as a result of high urbanization rates (Bhatt & Kongshaug, 2005). Urban sprawl has raised concern in the GTA as it is threatening the preservation of agricultural land (Bhatt & Kongshaug, 2005).

In the city of Toronto, increasing numbers of Torontonians are gathering together to produce food within their city as a means of promoting local food security through the reduction of food miles, strengthening of community ties, and increasing access and availability of fresh

nutritious food products. As identified through the above discussions, these Torontonians include: food activists from the Alternative Food Movement, low-income residents, immigrant groups, along with members of local food banks, and community organizations (i.e. FoodShare, The Stop Community Food Centre, Afri-Can Food Basket). The following will focus on the city of Toronto and will discuss the presence of intra- urban agriculture in relation to food-security within its municipal borders.

Community garden located in Toronto, Ontario.
Source: http://2.bp.blogspot.com/-5iq4dzyachY/UMsnubJY75I/AAAAAAAAAB9c/c5064VLJFj4/s1600/community-garden1.jpg

3.1.2. Urban Agriculture in Toronto:

Toronto has long been a leader in the global sustainable food movement, promoting food-security measures and urban agricultural practices (Baker, 2012; Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). The city's government leaders, institutions, and numerous public and private organizations have generally supported the development of urban agriculture within municipal boundaries (Baker, 2012). One example of such support took place on February 5, 2009 when the Parks and Environment Committee of Toronto's City Council dedicated a meeting to an expert panel discussion on urban food production (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). The panel sought to identify urban agriculture's exact infrastructure and policy needs to promote its positive environmental, social, and economic community benefits (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). Although support gaps still exist within municipal physical infrastructure, policies and practical support systems, Toronto has managed to foster over 100

community gardens each with numerous plots (Baker, 2012; Wekerle, 2002). These gardens are located across the city and can be found on rooftops; along the hydro corridors; around public and semi-public buildings such as churches, senior's housing, health centres, community centres, hospitals; and agencies such as FoodShare (Baker, 2012; Wekerle, 2002).

The following timeline (figure 5) outlines the early emergence of urban agriculture and the continual movement to support intra-urban agriculture within Toronto. Information for the following timeline was provided by The Food Policies Grow TO Action Plan (2012) along with Bhatt & Kongshaug (2000) Making the Edible Landscapes and Toronto Agricultural Program staff report from the Deputy City Manager (2013).

Figure 5: Timeline of Urban Agriculture in Toronto

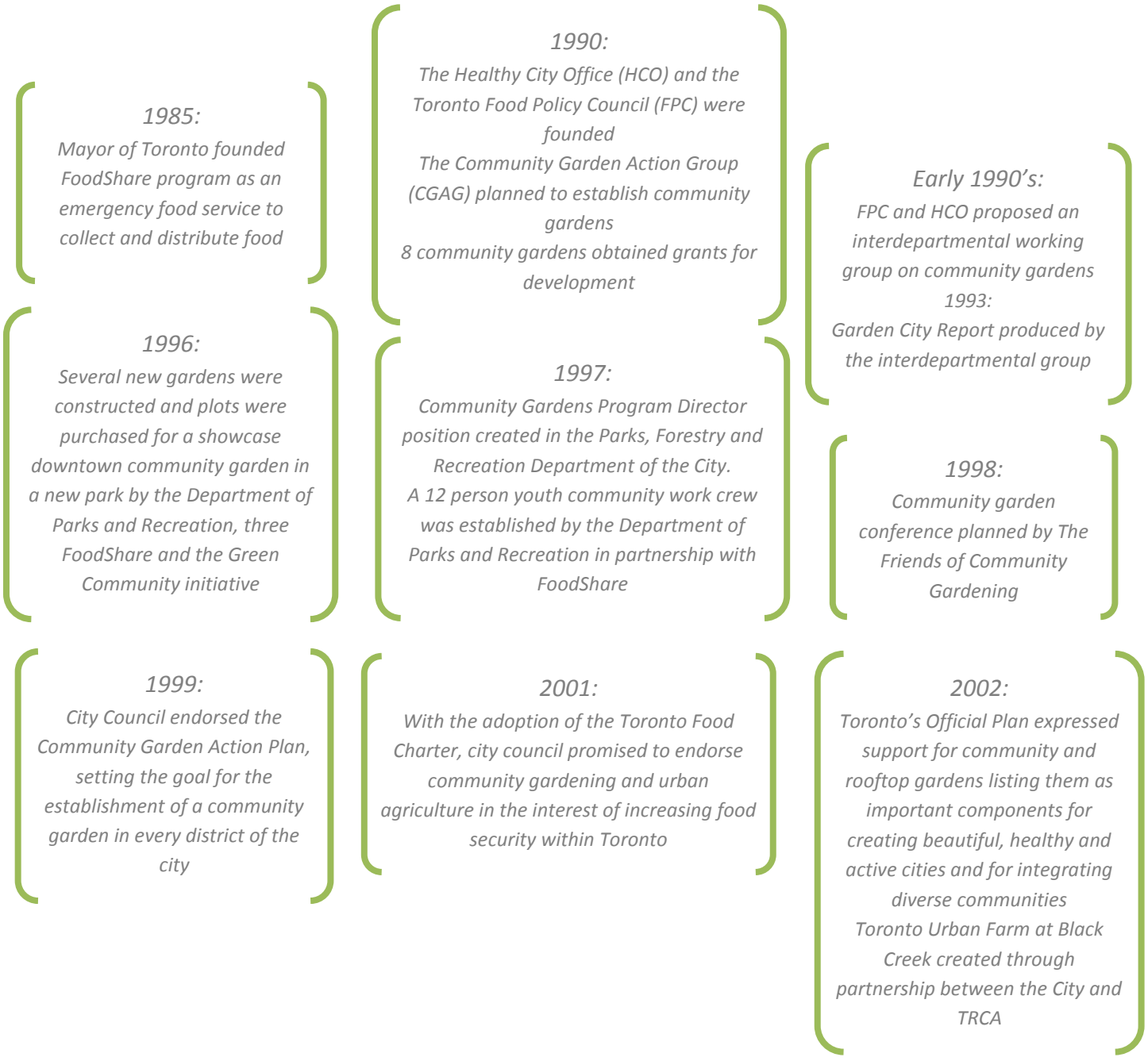


Figure 5 Timeline Continued…..

2004:
Annual American Community Gardening Association conference held by the City of Toronto

2005:
Toronto's Community Partnership and Investment Program funds FoodShare Toronto, along with its partners The Stop Community Food Centre, the Afri-Can Food Basket and Second Harvest to start the Toronto Community Food Animators Program.

2006:
Toronto supports TDSB research on market gardens Toronto's Official Plan articulates support for community and rooftop gardening once again emphasizing its importance for manipulative beautiful, health and active cities and for engaging diverse communities

2007:
A Community Gardening Manuel is published by Toronto Community Housing

2009:
TRCA introduces a progressive Sustainable Near-Urban Agriculture Policy
City Council adopts the report "Identifying Urban Agriculture Opportunities in the City of Toronto". This affirmed City Councils support for strategies and initiatives that achieve the overall goal of expanding opportunities for local food production in Toronto

2010
The Toronto Food Strategy is established as a unity in Toronto Public Health. Goals of the Strategy include the development of policy and program options to support an increase in urban agriculture activities across Toronto

2011:
The City of Toronto supports the GrowTO Speaker Series

2012:
City Council supports the Greater Golden Horseshoe Action Plan, which promotes the preservation of farmland in Ontario as well as the expansion of urban opportunities to produce food.
Toronto's City Council adopts the Toronto Food Policy Councils "GrowTO Urban Agriculture Action Plan"

2013
Construction of the 2013-2014 "Urban Agriculture Work Plan" describing strategies to link local growers, educate and train participants, promote & market UA activities, add value to urban gardens, cultivate inter-sectoral and departmental relationships, and develop supportive policies. 2013-2017 Toronto Parks Plan specifically integrated urban agriculture as a strategic goal in the process of planning implantation. Over the next 5 years Parks, Forestry, and Recreation will continue to increase the number of urban gardens, particularly in low-income neighbourhoods.

(Bhatt & & Kongshaug, 2005; Toronto Food Policy Council, 2012; Toronto. Deputy City Manager, 2013)

The timeline shows how intra-urban agriculture has emerged in the City of Toronto through community activism and political endorsement. A noted motivation for this activism is the desire of community groups to promote food security by increasing access to healthy, affordable, sustainable, and culturally appropriate foods (Urban Agriculture Summit Toronto, 2012; Toronto. Toronto Food Policy Council, 2012). A central political motivation for supporting intra-urban agriculture in Toronto, as exemplified by the founding of the Toronto FoodShare in 1985 and the adoption of the Toronto Food Charter in 2001, is to increase local food security in order to contribute to the health and well-being of residents and to strengthen the local food sectors growth (Toronto. Economic Development Department, 1998; Hamilton. Neighbourhood Development Strategy Office, 2013; MacRae, Gallant, Patel, Michalak, Bunch & Schaffner, 2010). Although other motivations for participating in intra-urban agriculture exist in Toronto namely, environmental stewardship, leisure, and recreation, food security has appeared throughout as a component of community and political endorsement for urban farming (Hamilton. Neighbourhood Development Strategy Office, 2013; MacRae, Gallant, Patel, Michalak, Bunch & Schaffner, 2010).

3.1.3. Types of UA in Toronto:

Intra- urban agriculture takes a myriad of forms within the municipal boundaries of Toronto with varying reasons for participant involvement. The products produced from UA within Toronto are generally used for personal consumption and donation (i.e. food banks, soup kitchens, homeless shelters etc.) (Respondent 3; Respondent 5; Respondent 6). The availability of locally grown products for personal use and donation undeniably increases access to nutritious food and promotes food security amongst the population. The ten forms of UA found in Toronto are: Residential Gardens and Edible Landscapes, Community Gardens on City Owned Land, Gardens or Farms on Institutional Land, Gardens at Schools, Entrepreneurial Farms/ Community Support Agriculture, Cleaning Projects and Orchards, Greenhouses, Urban Livestock, Rooftop farms, and Therapeutic gardens (Toronto. Food Policy Council, 2012). A brief description of these forms is provided below followed by a table identifying members various motivations.

Residential Gardens and Edible Landscaping:

Residential gardens are one of the most common forms of intra-urban agriculture and can be found on window sills, balconies, and yards of many Toronto residents (Toronto. Food Policy Council, 2012). Residential gardens transform the local landscapes into productive spaces growing vegetables, ornamental plants, and fruits. The food produced is generally for household consumption and assists in reducing household food bills.

Many non-profit organizations, such as The Stop Community Food Centre and Afi-Can Food Basket work with local residents to locate available arable urban plots for cultivation as they recognize the importance of such food production for supplementing household groceries, increasing access to healthy food products, and encouraging food cultivation as an active hobby.

Community Gardens on City Owned Land:

Toronto is home to more than 100 food-producing gardens located on City own land (Toronto. Food Policy Council, 2012). These gardens include allotment gardens (those administered by the City of Toronto through permits purchased by the plot- holders annually) and community projects run by non-profit groups (Toronto. Food Policy Council, 2012). These plots are located on parkland, as well as community centres and Toronto Community Housing Cooperation properties.

These plots grow vegetables and fruits using organic principles. The majority of produce grown is for personal consumption and used by non-profit organizations for food share and community kitchen programs.

Community garden, Toronto, Ontario. Source: http://hopecommunitygarden.files.wordpress.com/2008/10/_a218452.jpg

Gardens or Farms on Institutional Land:

A large number of urban-farms are located within community health centres, universities, and churches both on the grounds and rooftops. The produce is usually donated to local residents or used for community food programs (Toronto. Food Policy Council, 2012). The donation of food products helps to create and/ or strengthen ties between local institutions and the larger community while also promoting food security initiatives.

Gardens at Schools:

Non-profit organizations such as Evergreen, FoodShare, and Green Thumbs Growing Kids have transformed Toronto school yards into edible learning landscapes where children can grow food, learn about how food is produced, and build healthy relationships between food production and consumption (Toronto. Food Policy Council, 2012). In this context UA is used as a learning strategy to help children make better nutritional choices in order to increase their consumption of healthy fresh foods. The produce grown can be used for school lunch programs, and/ or donated for community consumption.

Toronto, Ontario student garden programs teaching students about healthy foods. Source: http://torontochildrensgarden.files.wordpress.com/2012/10/schoolprog2.jpg

School yards are optimal places for urban-farms as they are a major source of land. The cultivation of this land can lead to the creation of summer jobs, youth training opportunities, and food-growing opportunities for locals (Toronto. Food Policy Council, 2012). Such programs increase local access to nutritious foods and create a stronger connection between food

production and consumption, resulting in improved food knowledge and security for the local community.

Entrepreneurial Farms/ Community Supported Agriculture:

Urban agriculture has become attractive for entrepreneurs as the selling of locally grown produce allows growers to supplement their income. Fresh City Farms is one example of UA entrepreneurship in Toronto. Fresh City Farms produces food within various backyard "mini-farms" for sale (Toronto. Food Policy Council, 2012). The business is successful and delivers fresh produce to customers on a weekly basis. Businesses such as this increase urbanites access to fresh and affordable produce while also creating income generation opportunities.

Cleaning Projects and Orchards:

Non-profit groups such as Not-Far-From-The-Tree pick and distribute fruit which would otherwise not be harvested (Not-Far-From-The-Tree, 2014). The fruit picked is divided between the volunteers, community shelters, food banks, and community kitchens (Not-Far-From-The-Tree, 2014). The distribution on fresh fruits to organizations servicing low-income clients (e.g. food bank, community kitchens etc) assists in increasing local food security and access to nutritious foods which would otherwise be unavailable.

Toronto, Ontario based program 'Not-Far-From- The- Tree'.
Source:http://www.gardenthecity.com/storage/urban%20forage_notfarfromtree_TO.jpg?__SQUARESPACE_CACHEVERSION=1270510242651

Greenhouses:

Greenhouses appear throughout Toronto located in school yards, community centres, and near senior's residences (Toronto. Food Policy Council, 2012). These greenhouses allow urban-farmers to grow seedlings in addition to long season crops. Greenhouses are particularly popular amongst new immigrants who are unable to find or afford culturally specific food varieties within local grocery stores (Toronto. Food Policy Council, 2012; Toronto. Deputy City Manager, 2013). The use of greenhouses allows locals to grow food year round decreasing dependency on imported items and encouraging access to diverse crops.

Urban Livestock:

Although many legislative restrictions persist, preventing urban residents from keeping small and large animals (i.e. rabbits, goats, pigs etc), beekeeping and aquaculture projects exits within Toronto (Toronto. Food Policy Council, 2012; Respondent 2; Respondent 3; Respondent 5). Urban agriculture groups are pushing for the legalization of backyard chicken coops (for eggs) and the allowance of small livestock (Toronto. Food Policy Council, 2012; Respondent 2; Respondent 3; Respondent 5). The introduction of legislation permitting chicken coops and small livestock would allow local residence to supplement their meat intake as the province has become heavily reliant on meat imports (National Farmers Union, 2011).

Urban bee-keeping in Toronto, Ontario.
Source: http://farm6.staticflickr.com/5258/5

Rooftop farms:

A growing number of Toronto's restaurants are incorporating the city's Green Roof Bylaw into their businesses by constructing rooftop gardens (Toronto. Food Policy Council, 2012). The food produced is used by the restaurants and marketed on the menus as locally grown (Toronto. Food Policy Council, 2012). This practice reduces restaurants food bills but also attracts a niche clientele comprised of those desiring to participate in the local food movement. Additionally, other enterprises are incorporating rooftop gardens to their buildings as a means to improve the city's ecology and promote environmentalism (Toronto. Food Policy Council, 2012).

Rooftop garden Toronto, Ontario. Source: http://media-cache-ec0.pinimg.com/236x/71/fa/74/71fa7442344965259ccf8988a63d4585.jpg

Therapeutic gardens:

As mentioned within the Social Benefits section above, gardening has been found to be beneficial for mental and physical health. Due to these proven benefits, many social service agencies and health institutions of Toronto, such as the Canadian Mental Health Association, are utilizing UA as a therapeutic tool (Toronto. Food Policy Council, 2012). The Canadian Mental Health Association has established a community food garden for its patients to promote: healthy and active lifestyles, encourage self-confidence, strengthen participant's ties to their community, provide intellectual stimulation, develop employment skills, and promote food knowledge (Toronto. Food Policy Council, 2012).

After evaluating the various forms of UA present within the City of Toronto, if becomes apparent that member's motivations vary amongst and between these forms. From the above evaluation the following motivations stand out and can be comprised into the following categories:

Table 5: Urban Agriculture Forms and Motivations, Toronto

Form	Motivation
Residential Gardens and Edible Landscaping	Food supplementation; leisure/ hobby; increase personal and community access to fresh fruits and vegetables; sustainability ideals
Community Gardens on City Owned Land	Leisure/ hobby; personal consumption; donation to local food assistant programs; environmental and social ideals
Gardens or Farms on Institutional Land	Donation to local food assistant programs; strengthen community ties
Gardens at Schools	Education building; lunch programs; donation to local food assistant programs; AFM ideals
Entrepreneurial Farms/ Community Supported Agriculture	Entrepreneurship
Cleaning Projects and Orchards	Personal consumption; donation to local food assistant programs
Greenhouses	Leisure/ hobby; produce culturally appropriate foods
Urban Livestock	Increase community self-reliance; leisure/ hobby; AFM ideals
Rooftop farms	Provide for niche market; improve city's ecology
Therapeutic gardens	Overall health benefits; community building

Though variations may exist within these categories, the above table provides explanations for why a growing number of Torontonians are choosing to participate in UA activities, many of which mirror those identified in the literature review. Although municipal support, as depicted by the above timeline, stems largely from UA's potential for increasing community food security and self-reliance, along with its social, environmental, and economic benefits; food-security motivations amongst Torontonians appears to be a marginal motivation. However, it is important to notice that even though food-security is not the main driver behind participation, increased access to healthy, nutritious, sustainable, and culturally appropriate foods, at both the individual and community level, are still outcomes of participation.

3.1.4. Urban Agriculture and Food Security: Toronto

As defined within the "Urban Food (In) Security" section above, food security is "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life" (World Health Organization, 2014). In 1976 the Federal government of Canada signed the United Nations Covenant on Social, Economic and Cultural Rights, which included

"the fundamental right of everyone to be free from hunger." (Toronto. Toronto Department of Public Health, 2001). In spite of Federal support for the UN covenant, in 2012 Canada was still home to 4 million individuals (or 13% of Canadian households), including 1.5 million children, who experienced some level of food insecurity (Tarasuk, Mitchell,& Dachner, 2012). Food insecurity has been monitored across Canada since 2005 (Tarasuk, Mitchell, & Dachner, 2012). Between the years 2005 and 2012 the levels of documented food insecurity within each province have predominantly remained constant or increased, with reported levels of food insecurity being more prevalent in urban areas than rural settlements (Tarasuk, Mitchell,& Dachner, 2012).

Food insecurity is a social issue as it indicates deprivation of basic human needs i.e. access to nutritious food in adequate quantities necessary to maintain good health (Tarasuk, Mitchell, & Dachner, 2012). Individuals experiencing food insecurity are vulnerable to a myriad of social and emotional hardships, as well as, poor physical health and overall well-being (Tarasuk, Mitchell, & Dachner, 2012).

When examining the number of food insecure households by province, Ontario, Quebec, Alberta, and British Columbia accounted for the largest proportion of food insecure households in the country, with 84% of the total food insecure population residing within their borders (Tarasuk, Mitchell, & Dachner, 2012). Realizing the high social cost of food insecurity, the city of Toronto voiced their support for the national commitment to food security with the creation of Toronto's Food Charter, committing to uphold the following four principles:

> "Every Toronto resident should have access to an adequate supply of nutritious, affordable and culturally- appropriate food.
>
> Food Security contributes to the health and well-being of residents while reducing their need for medical care.
>
> Food is central to Toronto's economy, and the commitment to food security can strengthen the food sector's growth and development.
>
> Food brings people together in celebration of community and diversity and is an important part of the city's culture." (Toronto. Toronto Department of Public Health, 2001 p. 1)

In order to promote food security within Toronto the City Council outlined thirteen points of action, two of them being to: "encourage community gardens that increase food self-reliance, improve fitness, contribute to a cleaner environment, and enhance community development" and

"protect local agricultural lands and support urban agriculture" (Toronto. Toronto Department of Public Health, 2001). By ratifying this Charter, Toronto's City Council acknowledged the 21st century problem of food insecurity, generally ignored within municipalities of North America and the globe. Further, the inclusion of community gardens and urban agriculture as key action points within the Charter is significant as it illustrates how local governments view UA as an important component for achieving urban food security and health.

In practice, UA within Toronto's neighbourhoods has increased food security by making fresh produce more available and accessible to both urban-farmers and non-farmers (Respondent 1; Respondent 4; Respondent 5; Respondent 6; Fairholm, 1998). Participation in urban farming is popular amongst low- and- middle- income groups as it provides the opportunity for an additional income stream and decreases household food bills (Respondent 5). Unlike the large majority of Canadian cities, between the years 2005-and- 2012 Toronto experienced a decline in the proportion of food- insecurity (Tarasuk, Mitchell, & Dachner, 2012). Such a decline may be associated with residents increased interest and participation in various urban agriculture activities across the city. Lastly, the Toronto Parks Plan has made a commitment to increase the number of urban agriculture plots throughout the City, with a special focus being placed on low-income neighbourhoods (Toronto. Deputy City Manager, 2013). Such actions provide much needed support for Toronto's Food Charter and undoubtedly contribute to further reducing low-income household's experience of food insecurity. Although UA may not be the mainstay of food-security policy, its positive outcomes make it an important measure which should not be ignored for increasing urban food-security.

Despite UA's growing popularity amongst urban residents and increasing municipal support, UA's present contribution to North American urban food security should be critically examined. Within North America the Urban Agricultural Committee estimates that urban gardens produce roughly 5% of urban food products (Corbould, 2013). This estimate indicates that within developed counties UA still plays a negligible role in improving urban food security. Although UA's contributions vary between municipalities, its minor position has been attributed to limited space and restricted economic incentives (Corbould, 2013). These restraints along with urban sprawl, soil contamination threats, seasonal climate conditions, and sale restrictions must be addressed, in combination with policy initiatives, if UA is to play a more central role in future

food-security measures. The stated issues will be examined below when discussing UA's needs for the future. This discussion will assist in further framing UA's future relationship to food-security of affluent countries and show how such goals can be achieved.

3.1.5. Urban Agriculture Regulatory Bodies: Toronto

Urban agriculture has gained popularity amongst Toronto's urban residents with ongoing support from various organizations, agencies, and government bodies including: FoodShare, Toronto Food Policy Council, The Stop, Afri-Can Food Basket, Sustain Ontario, Toronto Urban Growers, Not-Far-From-the-Tree, Seeds of Diversity, and Young Urban Farmers. These organizations, and others, work with residents and the City to promote urban agriculture activities, provide land, ensure safe practices are met, and strengthen urban dwellers connections to locally grown food products. Through interviews it became clear that although urban agriculture activities are permitted within City policy, few municipal support mechanisms are formally in place (Respondent 5). The limited support mechanisms hinder urban agriculture's growth, creating constraints for acquiring land; cause confusion about regulations and municipal responsibilities; limit funding for City staff dealing with UA projects (i.e. the Parks Department) and increase wait times for UA project approval (Respondent 5).

Within the municipal boundaries of Toronto urban agriculture is not yet acknowledged as a land use category distinct from other land uses; but rather, is permitted within the land use categories of: Residential, Commercial, Institutional, and Open Space (Respondent 5; Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). The predominant crops on these urban farms are: vegetables, fruits, trees, flowers, ornamental plants, as well as beekeeping (Respondent 3; Respondent 5).

The municipality of Toronto does not have a designated government department or agency responsible for urban agriculture control, regulation or guidance; rather, these duties are divided amongst: Toronto Public Health; Parks, Forestry & Recreation; Toronto and Regional Conservation Authority (TRCA); Toronto District School Board (TDSB); Toronto Community Housing (TCH); Ontario Ministry of Agriculture and Food and Rural Agriculture (OMAFRA); as well the Federal Ministry of Agriculture. Each of these organizations and agencies possess different functions, including: monitoring, controlling, and/or providing guidance for various

urban agriculture issues and needs. The duties of these groups range from monitoring health/ safety practices and providing land, to enforcing pesticide use and regulating specific UA practices (e.g. not allowing animal husbandry).

Urban agriculture's popularity amongst urban residents and community groups has increased its presence within the municipal borders of Toronto. Increased interest in UA is exemplified by the growing number of community gardens within Toronto, which have increased from just 69 gardens in 1997 to over 100 community gardens today (Bhatt & Kongsgaug, 2005; Toronto. Toronto Food Policy Council, 2012). Although the above stated agencies and organizations provide much needed services and tools for UA practices and participants, interviews reveal that it would be beneficial to create a single department responsible for all matters associated with UA (Respondent 5). The existence of a single department would make resources and information more readily available, streamlining the process (Respondent 5). Furthermore, urban agricultural practices would benefit from being recognized as a land category distinct from other land uses as this would highlight its unique characteristics and provide more opportunity for legislative change (Respondent 2; Respondent 5, Carolyn).

3.1.6. Needs for the future: Toronto

Through interviews, review of the Grow TO Action Plan, and Metcalf Report five reoccurring points were identified as essential needs for sustainable UA growth to promote food production and security within the city of Toronto. These five needs are: 1. Adaption of Official Community Plan and Zoning Bylaws to increase land-security; 2. Improve grower access to land and space; 3. Increase funding for UA projects; 4. Broaden knowledge of food production through education and training; and 5. Develop supportive UA policies.

1. Adaption of Official Community Plan and Zoning Bylaw for land-security

Preparing urban plots for agriculture is a time consuming and costly process as soil must first be tested for harmful contaminants, with some plots requiring de-contamination (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). In order to warrant such investment, urban-farmers require long-term and stable access to land (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). Although many forms of urban agriculture

such as backyard gardening, sharing-programs, and planting of urban fruit trees do not require changes to the Official Plan or Zoning Bylaw, large scale projects would benefit from changes in order to secure continual access to land (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010).

As outlined in the previous timeline, The City of Toronto in combination with community organizations and advocates have done much to support UA within Toronto's municipal borders. Much of the support for UA activities stems from Toronto's food strategies, expressing the City's commitment to strengthening urban food systems, including urban agriculture initiatives (Hamilton. Neighbourhood Development Strategy, 2013). Although Toronto has made great strides with the adoption of supportive UA policy, there remain some policy gaps to be addressed by urban planners and policy makers.

The Official Community Plan mentions urban agriculture, but tends to refer to its practices in relation to city beautification and greening rather than food production. Additionally, policy related to agriculture and gardening is only mentioned within one of eight land-use designation, being Section 4.4 utility corridors (Toronto. Toronto Official Plan, 2010). As zoning bylaws reflect communities Official Plans, clearer language outlining UA's relationship to food production would assist in ensuring long-term support for UA activities and potentially provision the future creation of urban agricultural zones. The Official Plan is reviewed every five years, with revision currently taking place. This offers an excellent opportunity for urban agriculturalist and activists to lobby for a broader identification of urban agriculture and to identify its practices as a component of local food production within the Official Community Plan.

City zoning is a powerful planning act tool which can be used by municipalities to promote UA. City zoning is important for the future of UA as it provides site-specific regulations related to land-uses within the nine land-use categories of: residence, public, commerce, performance, industry, parking, institution, administrative, and accessory. Although the City of Toronto does not specify agriculture as a land-use category on its own, two land use definitions within the City's industrial land-use category mention agriculture and may prove useful for future large scale commercial UA production (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). The definitions are:

> Agricultural Uses "Premises used for growing and harvesting plants or raising animals, fowl, fish or insects, and may include aquaculture… The definition of agriculture use should be broad enough to capture the range of uses anticipated. An agricultural use is the cultivation of plants and the raising of animals primarily for food."
>
> Market Garden: "A market garden is an area that is used for the growing of plants. A market garden is not a residential property. Lands such as Hydro corridors or roof tops could also be used for growing food and plants" (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010, p 16).

Toronto's recognition of UA within existing land-use zones is significant, however for the future growth and security of urban agriculture activities within the City changes to the Official Plan and Zoning designations should include the creation of Urban Agriculture and Garden zoning land-use designations (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010) . The North American municipalities of Philadelphia and Cleveland already possess such designations and can be used as useful reference points (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak, & Snider, 2010). Furthermore, revision of bylaws preventing the sale of Toronto- grown food through Community Shared Agriculture programs, at farmers markets and at sites of production are needed to further encourage locally grown and purchased food (Toronto. Toronto Food Policy Council, 2012). Such changes allowing for the sale of products would provide the necessary economic incentives to increase urban food production and consumption.

2. Improve grower's access to land and space:

A recent study found that Toronto's landscape has the potential to produce ten percent of the fresh vegetables currently provided by the market (Toronto. Toronto Food Policy Council, 2012; Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). Additionally, interest in urban farming amongst Torontonians has increased with a desire to grow more food throughout the city (Toronto. Toronto Food Policy Council, 2012). The combination of high potential for food production and increasing interest amongst local residents provides the perfect conditions for UA. However, the challenge lies in firstly identifying where these lands and spaces are located and secondly making them available to urban-farmers. This is a challenge as a

comprehensive land inventory list, outlining suitable land and rooftops for agricultural use, does not exist (Toronto. Toronto Food Policy, 2012; Respondent 5). Such an inventory would be useful for two main reasons, firstly the list of available land and space would provide a snapshot of the city's growing potential and could be used by city planners for future growth plans, zoning and monitoring; and secondly, it would be an excellent resource for community members and groups in search of urban agricultural land (Toronto. Toronto Food Policy Council, 2012).

The inventory would include the identification of public, private, and institutional lands and roof tops; such as churches, hospitals, office towers, condominium complexes, and more which are available for agricultural production (Toronto. Toronto Food Policy, 2012). The list would then be used to match available space with individuals and groups wishing to grow crops (Toronto. Toronto Food Policy, 2012). Finally, such an inventory would provide the Toronto City Council, policy makers, and planners with a clear picture of urban agricultural activities within the City, setting the stage for more legislative recognition (Respondent 5).

3. Increase funding for UA projects

In Toronto funding for UA projects presently comes from three main sources: 1. NGO's (foundations) 2. Corporations and 3. The City of Toronto (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). Additional support is provided in the form of in-kind contributions. These contributions reduce NGOs and urban farmers costs by donating goods and services, such as compost and water connections (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). In order for urban agricultural projects to expand and promote food security, reliable funding initiatives will be needed.

<u>NGOs/ Foundations:</u>

NGOs operating urban agriculture programs in Toronto rely heavily on foundations as a primary source of funding (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). In order to support long-term projects it is imperative that more funding sources are located. In 2009 the Canadian Institute of Planners held a workshop with the purpose of informing professions and vocations not typically involved in UA activities about the projects and opportunities for support (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,&

Snider, 2010). Workshops and conferences such as this, are needed in order to secure future funding for project growth.

Corporations/ Private Sector:

In order to secure funding from the private sector urban agricultural project proposals must meet business objectives by ensuring profitability. For urban agriculture to expand on a commercial scale and enter the mainstream food market, value must be added to the products through processing (Toronto. Toronto Food Policy Council, 2012). Given the high cost of food production and processing private-sector funding is essential as few facilities presently exist. The high demand for locally grown and processed foods has created a large untapped commercial opportunity with the potential for high return on investment. In order to realize the economic potential of urban agriculture, as well as promote local food security, facilities such as washing stations, commercial kitchens, processing stations, and packaging centres must be made available.

City of Toronto:

Municipal financing for UA projects come from two main sources: 1. "Live Green Toronto Community Investment Program", focusing on environmental health projects within Toronto; and, 2. "Food Security Investment Program" which greatly assist neighbourhood UA projects through the community food animator program (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). Additional non-financial support comes in the form of goods and services; namely, site identification, garden design, water hook-ups, and compost (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010)

Unlike, many municipalities globally, i.e. the Borough of Islington in London UK, Toronto does not earmarked funding for UA projects (Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). In order for UA to expand and meet food security goals of the City, direct investment is needed along with additional infrastructure programs. Direct financing would provide stable long-term investment and would offer much needed security amongst urban agriculturalists. Such financing would also be beneficial to the municipality as investment in UA projects have proven benefits for environmental and community health; as well as economic growth and food security.

4. Broaden knowledge of food production through education and training

Urban living tends to create disconnect between food production and food consumption as few urban dwellers have the opportunity to participate in the growing process. This disconnect translates into a limited understanding of how food is produced and can lead to poor food consumption choices amongst youth and adults alike. Growing enthusiasm for urban farming has led to an increasing number of residents wanting to participate in food production as means of decreasing household food bills, as a hobby, for income generation, and as a way to engage with their community. In order to successfully participate in urban agricultural practices new participants must be properly trained (Toronto. Food Policy Council, 2012; Respondent 6).

Toronto is fortunate as it possesses knowledgeable agriculturalists dedicated to improving food production within the City. Due to Toronto's multi-cultural population, urban growers have brought agricultural knowledge and skills from across the globe allowing for the introduction of diverse crops (Toronto. Toronto Food Policy Council, 2012; Respondent 5; Respondent 6). These groups are an asset to UA projects as they provide a source of knowledge and training for new urban agriculturalists less familiar with cultivation.

Other useful resources for training and education are local universities such as Ryerson; workshops, tours, and educational events held my non-profit groups; and online publications and resources (Toronto. Toronto Food Policy, 2012; Respondent 3). Although these resources are beneficial to the urban agriculturist community, more centralized and coordinated resources provided within one location would improve accessibility and allow for more streamlined training and education programs (Toronot. Toronto Food Policy, 2012; Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). UA projects would also benefit from training and education initiatives targeted at strengthening community capacity to produce food by providing more opportunities for hands-on training (Toronto. Toronto Food Policy 2012; Nasr, MacRae, Kuhns, Danyluk, Kaill-Vanish, Michalak,& Snider, 2010). The development of beginner's gardens within neighbourhoods offering demonstrations and guidance would provide ideal learning spaces for teaching initiatives. Lastly, formalized food literacy of food education programs within local elementary and high schools would serve to connect youth to local food production and offer entrepreneur and apprentice learning opportunities (Toronto. Toronto Food Policy, 2012; Respondent 6).

5. Develop Supportive UA Policies

Targeted policy support is essential for the growth and prosperity of urban agriculture within Toronto. Although the 2001 Toronto Food Policy and the 2010 Toronto Food Strategy identify urban agriculture as a strategic resource for population food security and health, municipal and provincial policy gaps persist, restraining long-term growth of UA. Three suggestions for policy development identified as essential for UA prosperity are: 1. Changes to the Ministry of Environments community composting regulations; 2. Revision to the Association of Supervisors of Public Health Inspection of Ontario's (ASPHIO) guidelines regarding product requirements for farmers markets; and 3. Increase the amount of resources available to urban farmers.

Community composting regulations:

Presently, the Ontario Ministry of Environment states that it is illegal to transport waste from one site to another without a permit (Respondent 2). This hinders urban agricultural production as in order to transport compost and composting materials to urban farms, participants must first apply for approval and be granted a permit. If a permit is not obtained these actions are deemed illegal and can be punished as such (Respondent 2).

In order to streamline the composting process and avoid lengthy processing times, the Toronto Food Policy Council and Sustain Ontario are asking for the municipality of Toronto to work with the Ministry of Environment to fast-track the approval process for mid-scale composting facilities (Respondent 2; Toronto. Toronto Food Policy Council, 2012).

Revise Association of Supervisor of Public Health Inspection of Ontario (ASPHIO) guidelines:

Current policy does not recognize urban growers as a farm business for the purpose of selling produce at farmers markets or from sites of production (Respondent 2; Toronto. Toronto Food Policy Council, 2012). Such regulations reduce economic incentives of UA participation, leading some to search for legal loop holes to enter the market place i.e. owners of Farmers Markets seek exemptions from public health regulations if 50+ 1 of their vendors are recognized farmers (Respondent 5). Thus, a revision of the ASPHIO's guidelines to permit the sale of urban

farmers produce within farmers markets would provide growth opportunities for urban agriculture and bolster its economic potential.

Increase urban agriculturalist resources:

Urban agriculturalists lack of formal recognition further impacts their access to resources in comparison to recognized rural farmers. For urban agriculture to develop, it is therefore important for the municipality of Toronto to work with the Ontario Ministry of Agriculture, Food and Rural Affairs to increase the amount and quality of farming resources available to urban agriculturalists (Toronto. Toronto Food Policy Council, 2012).

3.1.7. Lessons Learned: Toronto

Ontario's rich agricultural history is transforming with global economic trends and urban growth. Such transformations have resulted in the shrinking number of farms, the growing size of farm corporations, and increasing reliance on food imports. In the City of Toronto, these changes, coupled with urban sprawl, have given rise to the Alternative Food Movement concerned with food justice, food miles, rising import prices, and urban dwellers nutritional security. Apprehensions over the sustainability of the global food market have led to local non-profit organizations, individual citizens, and various government bodies working to promote urban agriculture activities within Toronto's municipal boundaries. This is significant as unlike many other North American municipalities, the City of Toronto has recognized the need for urban food policy as a means to promote food security and insulate food supply chains.

Urban agriculture within the City of Toronto has an advantage in comparison to other North American cities for four main reasons; firstly, Toronto has the benefit of possessing a Grow TO Action Plan outlining the existence and future needs of urban agricultural practices. Secondly, the City is home to various vocal non-profit groups such as Afri-Can Food Basket, Sustain Ontario, FoodShare, Toronto Food Policy Council, and Urban Growers, to name a few, who work tirelessly to promote urban agriculture programs and support agricultural education amongst interested city dwellers. Thirdly, Toronto has a diverse immigrant population with ample agricultural knowledge and skills offering a rich opportunity for the transfer of knowledge. Lastly, the City has formally recognized UA opportunity for increasing local food security within the Toronto Food Charter of 2001 and Toronto Food Strategy of 2010. Although

gaps still exist within infrastructure and support policy, such recognition provides the necessary foundational support for moving forward.

The question which persists is can intra- urban agriculture increase food-security amongst urban residence of North America? The absence of longitudinal studies creates some barriers to fully answering this question; however existing studies have pointed to UA abilities to increase urban dwellers access to fresh nutritious fruits and vegetables, through direct participation and by increasing the availability of affordable locally produced products for purchase (Fairholm, 1998). Additionally, the revival of urban agriculture activities points to Canadians interest in participating in food production, taking control of their nutritional needs, and increasing their access to fresh food products (Fairholm, 1998).

Work from Ryerson University has found that the practice of cultivating crops within cities is an important strategy for improving the food and nutritional security of urban populations (Ryerson University. Centre for Studies in Food Security, 2014). Such findings have garnered interest around urban environment's potential for food production with many voicing support for crop cultivation in or near urban centres (Fairholm, 1998). Urban agriculture has been framed by activists within many municipalities; namely Vancouver British Columbia, as a means of increasing food security and urban dwellers resilience to food crisis (Mullinx, Fallick, & Henderson, 2009). Despite urban agriculture's potential to promote food-security within North America, this dimension does not appear to be the main driver behind participation within affluent cities. As the literature review revealed North American urban farmers appear to be more motivated by non-food products such as pursuit of leisure, community building, environmental stewardship, and food knowledge/ education. Although some individuals and groups participate for the purpose of increasing individual and community food-security, this motivation still appears more marginal. Thus, UA's relationship to food-security within affluent cities is constructed as a sustainability goal to be achieved within the near future, rather than an immediate reality.

In order for intra- urban agriculture to produce more meaningful contributions to North American food-security, municipalities must respond to UA's land, resource, and policy needs in addition to providing strong municipal support (Mullinx, Fallick & Henderson, 2009). The number and size of plots needed to feed urban residents varies between municipalities and is

strongly dependent on population size and land soil capabilities. For this reason municipal support in land inventory and soil capability grading is necessary for implementation success.

In terms of intra- urban agricultures present and future success, it has notably been used by local food movements within North America to promote food security. These movements have adopted UA as its practices move beyond anti-hunger campaigns to encourage self-sufficiency and community partnerships for the successful promotion of community health and nutrition (Fairholm, 1998). By promoting intra-urban agriculture through a multi-sectoral approach (various bodies of government, non-for profit, and community organizations) its practices can encourage food security by targeting the root causes of hunger and access issues, rather than just the symptoms of insecurity (Fairholm, 1998). UA movements are viewed as reducing food insecurities because they not only improve access to affordable nutrient rich products, but also, encourage economic growth and re-investment necessary for its sustainability and prosperity (Fairholm, 1998). The resurgence of urban agriculture involvement has provided community members with more access to healthy food at lower prices assisting in reducing the percentage of household income spent on groceries (Fairholm, 1998).

Urban agriculture has been well-documented as a food-security practice within developing countries and has shown great potential throughout history for increasing food security within North American cities during times of food crisis (Maloney, 2013; Bellows, Brown & Smit, n.d; Lee-Smith, 2010). Although urban agriculture should not be viewed as a magic bullet that will solve all food insecurity issues within North American cities, it should be granted recognition for its current contribution and future potential for increasing communities' access to nutritional foods through direct participation and purchase. Municipalities, Alternative Food Movements, non-profit organizations, and citizen groups should continue to work together to promote intra-urban agriculture as it provides urbanites with the opportunity to take control over their diets and promote their own food security; while at the same time, strengthening local economies, community ties, and improving urban environments.

3.2. Africa

The presence of urban agriculture, most notably in low-income developing nations, has continued to grow with rising rates of urbanization (Mougeot, 2000). Presently, 50% of Africa's total population resides in cities, with this rate expected to steadily increase (De Bon, Parrot, & Moustier, 2010). Within a vast number of African cities, municipal infrastructure, services (road networks, transportation, housing, water, sewage etc), and formal employment opportunities have been unable to keep pace with such rapid urban growth (Vermeiren, Rompaey, Loopmans, Serwajja, & Mukwaya, 2012). In addition, devaluation of currency, rampant unemployment, and removal of food subsidies have crippled low- income and increasingly middle-income groups' ability to purchase food products from traditional global markets (Mougeot, 2000). The resulting limited purchasing power of the population increases food insecurity, reducing access to nutritious foods required to meet daily dietary needs. (Mougeot, 2000). The severity of food insecurity is illustrated by the fact that in 1990 the urban poor of low income countries were spending, on average, between 50%-80% of their total income on food products, which in most cases did not satisfy their daily nutritional needs (Mougeot, 2000).

Given urban poor's limited access to resources and employment within the industrial and service sectors, urban agriculture has provided a much needed source of income and food supply (Mougeot, 2000; De Bon, Parrot, & Moustier, 2010).Within developing cities UA has and continues to, increase individual and community food-security, provide steady income streams, as well as offer a much needed system for the recycling of urban waste and the beautification of vacant urban spaces (Mougeot,2000; De Bon, Parrot, & Moustier, 2010). National data has found that although the majority of Africans reside in urban settlements, agriculture remains the primary source of income for the population (De Bon, Parrot & Moustier, 2010). These statistics are the result of urban dwellers high participation within urban agriculture for employment opportunities (De Bon, Parrot, & Moustier, 2010). Presently, 800 million people worldwide participate in UA activities; of this group 200 million produce products for market sale, employing 150 million full time workers (Smit et al, 1996 found in Mougeot, 2000). Furthermore, out of 65 million people approximately 25 million urban dwellers of Eritrea, Ethiopia, Kenya, Tanzania, Uganda, and Zimbabwe supplement individual and household food supplies with UA (Denninger et al, 1998 found in Mougeot, 2000). It is estimated that by the

year 2020 approximately 35-40 million urban residents will depend of UA to sustain themselves (Denninger et al, 1998 found in Mougeot, 2000).

Although urban agricultures role in African communities tends to focus primarily on food-security, as in North America UA's multi-functionality within the public realm assists in garnering public support for its activities. As discussed in the literature review, apart from food security UA promotes community integration, providing an economic space for low-income participants who would otherwise be left out of the market place. This integration allows rural migrants to utilize their agricultural skills and knowledge within the urban sphere and integrate into larger society through the sale of produce (De Bon, Parrot, & Moustier, 2010). UA within developing cities also provides environmental benefits with the recycling of urban waste and by promoting the beautification of the urban landscape (De Bon, Parrot, & Moustier, 2010). Like in North America, UA activities when integrated into the fabric of cities produce social, economic, and environmental benefits which can be enjoyed by the wider community.

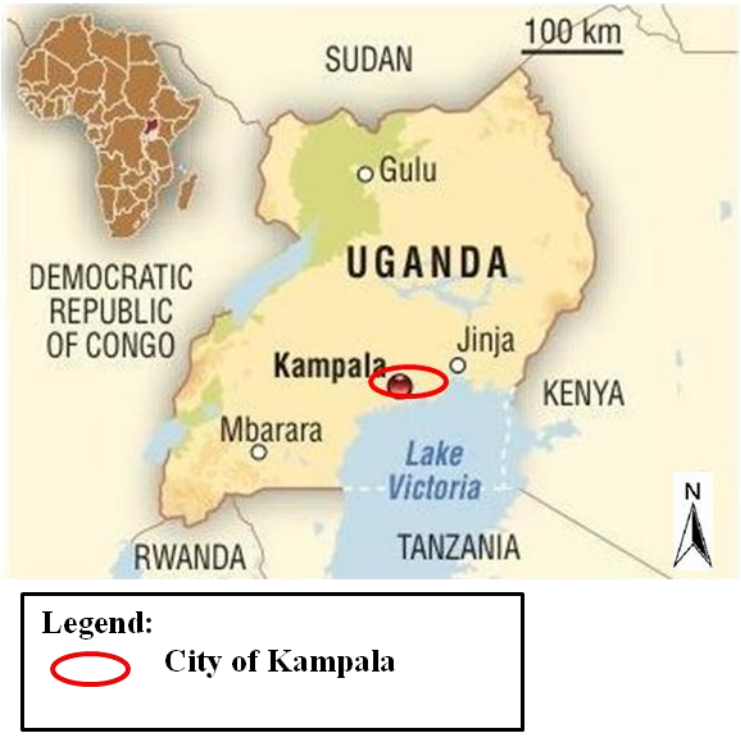
The multi-functionality of urban agriculture, coupled with its ability to mitigate growth pressures, has encouraged its development and increased its visibility on the international stage. The following sections will examine UA presence in Kampala, Uganda. This examination will provide information on UA within the African context. Although there exists various motivations for participating and numerous forms of UA, the following examination is concerned with intra-urban agriculture for the purpose of promoting food security and health amongst Kampala's urban population.

3.2.1. A Closer Look: Kampala, Uganda

Kampala is the capital city of Uganda located in East Africa. The City is situated near the shores of Lake Victoria, the second largest fresh water lake in the world (Zijlma, 2014). The principle land uses within the municipality are predominantly residential, along with small-scale agriculture (Kampala. Kampala Capital City Authority, 2013). The city's ample green spaces, parks, and gardens make it one of Africa's "greenest" cities; however, this is threatened by fast paced urban growth (Zijlma, 2014). In the year 2012 the city was home to 1.74 million people, with an annual growth rate of 5.6% making it Uganda's most populated city (Uganda Bureau of Statistics, 2012; Vermeiren, Van Rompaey, Loopmans, Serwajja, & Mukwaya, 2012). Kampala

has a total land area of 180.1 km² with an average density of 6100 persons per km² rising to over 30 000 pp/km^2 in the slums (City Population, 2012; Vermeiren, Van Rompaey, Loopmans, Serwajja, & Mukwaya, 2012). Rapid urbanization continues to place pressure on local authority's ability to provide adequate infrastructure and services (Vermeiren, Van Rompaey, Loopmans, Serwajja, & Mukwaya, 2012). Government's inability to keep pace with growth rates has culminated in major socio-economic and environmental issues resulting in declining quality of life for urban dwellers (Vermeiren, Van Rompaey, Loopmans, Serwajja, & Mukwaya, 2012). The major source of urban population growth is rural to urban migration, coupled with high natural growth rates (Vermeiren, Van Rompaey, Loopmans, Serwajja, & Mukwaya, 2012).

Map 3: Kampala, Uganda



Administratively, the City is classified as a district comprised of five divisions: Central, Makindye, Nakawa, Kawempe, & Rubaga depicted in the map below (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). These divisions are further divided into zones, individually administered by the relevant level of Local Council (LC) (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). Geographically, the City is built upon various hills separated by wetland valleys frequently used for farming and into which

municipal sewage, along with domestic and industrial waste are filtered (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010).

Map 4: Districts of Kampala

Source:http://www.mcgill.ca/mchg/sites/mcgill.ca.mchg/files/images/kampaladivision.jpg

Agriculture has long been the backbone of Uganda's economy owing to the country's favourable soil and climate conditions; enabling the region to remain largely self-sufficient in food production (Uganda. National Department of Agriculture, 1998). During the 1970s and 1980s the commercial agricultural sector greatly suffered from political and economic instability stemming from governmental mismanagement and civil war (Uganda. National Department of Agriculture, 1998). Within the 21st century, Kampala has been Uganda's source of economic, political, and social transformation (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). Like the rest of Uganda, Kampala's fertile soil, tropical climate, and ample rainfall makes it ideal for agricultural production (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). Uganda's agricultural sector accounts for 90% of its

exports earnings, 80% of employment, and the majority of the raw materials that are channeled into the substantially agro-based industrial sector concentrated within Kampala (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010; Uganda. National Department of Agriculture, 1998).

The major food crops produced within Kampala, as well as other regions of Uganda, are: plantains, cassava, sweet potatoes, millet, sorghum, corn, beans, and groundnuts (Uganda. National Department of Agriculture, 1998). Roughly 64% of Uganda's agricultural GDP comes from harvesting food crops produced primarily by approximately three million farm households; of which 80% are situated on less than 4ha of land using manual tools (MFPED 2002, 2003 found in David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). In order to stimulate the economy through exports, the federal government has encouraged the production of cash crops (Uganda. National Department of Agriculture, 1998). As discussed in the literature review, cash crops are those grown for direct sale/ export rather than for local subsistence, heavily reliant on mono-cropping rather than mixed crops. Uganda's most lucrative cash crops for export are: coffee, tea, cotton, and tobacco (Uganda. National Department of Agriculture, 1998). Although there has been resurgence in the production of these crops, during the 1980's civil unrest and economic crisis severely eroded commercial farming and cash crop production (Uganda. National Department of Agriculture, 1998). Though, cash crops have been used as a means to reduce rural poverty within Uganda, their practices have given rise to numerous environmental effects; namely, soil-erosion and land degradation resulting from poor land management (Pender, Nkonya, Kato, Kaizzi & Ssali, 2009).

In conjunction with rural and commercial agriculture, the practice of urban agriculture has always been present within Kampala used as a survival strategy amongst the urban poor, chiefly practiced amongst women (Ssembalirwa, 2008). Urban agriculture expanded in Kampala during the 1970's due to harsh economic realities and political instability under Idi Amin's dictatorship (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). UA participation continued to grow after Idi Amin's reign, spurred by increased feelings of safety, along with structural adjustment and enabling policies (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). The following sections will focus on the

presence of intra-UA within the municipal boundaries of Kampala and discuss its central function of promoting food-security and income generation amongst the urban poor.

3.2.2. Urban Agriculture in Kampala

Kampala is built upon the historical Buganda Kingdom possessing a long tradition of agricultural practices (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). The City's location on fertile land encouraged urban agricultural practices especially throughout the 1970s and 1980s, during which time the country was plagued by economic crisis, civil unrest, rising food prices, and a loss in food subsides caused by institution breakdown (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010; Bhatt & Kongsgaug, 2005). Those who participate in urban agriculture are greatly motivated by food insecurity, as well as obtaining an additional source of household income; thus, the objectives of production are subsistence and commercial farming (Bhatt & Kongsgaug, 2005).

Urban agriculture taking place in Kampala, Uganda.

Source: http://2.bp.blogspot.com/-SLQfT1ACq6I/UP8gfXmUZhI/AAAAAAAABGQ/dUPErOvRuQY/s400/Umoj+Interns.JPG

Research assessing the presence of UA within Kampala took off in the 1990s with Maxwell's evaluation and documentation of its prominence (Maxwell, 1995 as found in David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). In 1993, Maxwell conducted a survey of three neighbourhoods and found that 35% of households engaged in agricultural activities, primarily crop cultivation (Maxwell, 1995 found in David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). In 1992, 56% of municipal land

was found to be used for agriculture, with 70% of poultry and eggs produced and consumed within the City's boundaries (Maxwell, 1995 found in David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010; Bhatt & Kongsgaug, 2005). Once harvested, 20% of the produce is dedicated towards household consumption, with the remaining 80% sold for profit (Bhatt & Kongsgaug, 2005). The widespread household involvement in intra- UA practices signifies its importance to the livelihoods and diets of roughly half of Kampala's residents, while also indirectly affecting the community as a whole (Bhatt & Kongsgaug, 2005).

Urban agriculture plot in Kawempe division, Kampala.

Source: http://pemo-ug.org/agric-projects.html

Before UA's formal legalization in 2004, Ugandan government's attitude towards intra-UA could best be described as oscillating between neutral and unfavouable; at times accompanied by hostile policy (Bhatt & Kongsgaug, 2005; Ssembalirwa, 2008). Hostile policies towards UA were the product of its practices being perceived as a public nuisance and a risk to public health (Ssembalirwa, 2008). It was not until legislative changes occurred in 2004 that UA became legal and formally recognized (Ssembalirwa, 2008). The legalization of intra-urban agriculture has allowed for the development of streamlined policy provisions and guidelines embodied in numerous Urban Agriculture Ordinances (Ssembalirwa, 2008).

Kampala's five urban agriculture ordinances were issued by the Kampala City Council (KCC). The KCC is a municipal government run under the Republic of Uganda Government Decentralization Policy and Local Governments Act (LGA) (Ssembalirwa, 2008). The Decentralization Policy and LGA issued by the Uganda Parliament devolved lawmaking to the municipal level (Rockefeller Foundation, n.d.). In the context of UA, this decentralization and devolution of governmental functions, powers, and services was intended to support and guide

the development of UA to empower people's capacity for food production, value addition, and employment creation (Ssembalirwa, 2008; Rockefeller Foundation, n.d.) The UA ordinances were further enabled by Uganda's local and national commitment to poverty reduction (Rockefeller Foundation, n.d.). Kampala's UA ordinances provide "…regulations for the commercial growing, handling and distribution of plants, fish, and livestock within Kampala." (Rockefeller Foundation, n.d. p.2). The ordinances require urban farmers who wish to sell their products to obtain a permit and agree to allow their operations to be inspected by an agricultural extensions agent, ensuring best practices are upheld (Rockefeller Foundation, n.d).

The following timeline (Figure 6) outlines Kampala's government's changing attitudes towards urban agriculture, as well as organizations continual movement to support its practices within the City. Information for the following timeline was provided by Diana Lee-Smith's case study examining the development of new city ordinances on UA within Kampala (2005, p1-18).

Figure 6: Timeline Urban Agriculture in Kampala

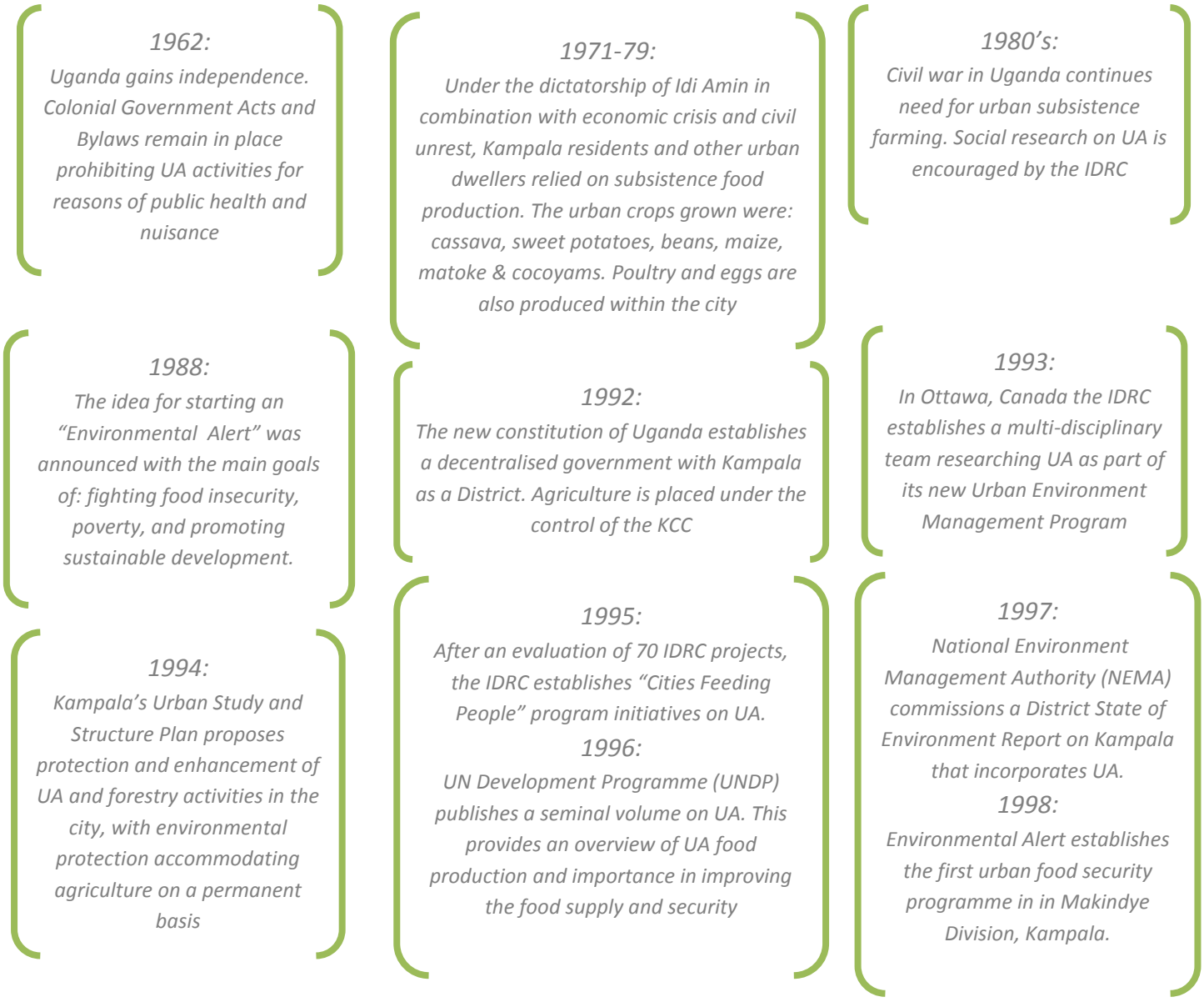


Figure 6 Continued…

2000?

Living Earth and Plan International Development further NGO programmes on UA in Kampala extending services to farmers.

2001:

KCC begins a process of reviewing its UA ordinances in order to make them serviceable.

SIDA supports research on "Land Tenure and administrative issues in Kamala and their effects on urban development".

Recommends that UA should be included in planning by NARO &Ministry Agriculture & that UA legislation should exist

2001:

IDRC supports a regional workshop on "The Political Economy of UA"

2002:

Diana Lee-Smith is appointed African Regional Coordinator for Urban Harvest & begins work on the project "Strengthening UA in Kampala"

2002:

A workshop is held to raise awareness of UA in Kampala, organized by Environmental Alert and KCC (funded by RELMA)

2002:

Urban Harvest approves the grant to the project "Strengthening Urban Agriculture in Kampala, Uganda"

A second meeting of the Health and UA Coordinating Committee is held in Kampala

2002:

Health and UA project coordinator hired in Kampala for one year.

2003:

District Forum on review of the draft ordinances, held in Kampala. Important as support for legalizing UA is growing & seen as viable option. This is a critical event is changing UA policy. After the forum interested individuals began to draft Ordinances to be reviewed by Council

2003:

The draft Ordinances are forwarded together with the committees' comments for full Council deliberation.

2004:

The KCC passes the full set of Ordinances with amendments

The Health & UA Coordinating Committee meets and transforms itself into KUFSALCC- Kampala Urban Food Security, Agriculture & Livestock Coordinating Committee

2004:

Mayor of Kampala announces land will be allocated for UA and housing project

2004:

Urban Harvest and KUFSALCC finalize publications of Ordinance Guidelines

Mayor of Kampala announces new Ordinances at press conference. Printed Guidelines are circulated.

Urban Agriculture is deemed a legal activity

(Lee-Smith, 2005, p 1-18)

The above timeline illustrates how UA transitioned within Kampala from an illegal activity to a legal practice. It is apparent that international organizations such as the International Development Research Centre (IDRC) and the Swedish International Development Cooperation Agency (SIDA), along with many other non-government organizations (NGO's) and researcher teams, played a crucial role in fostering the development of supportive UA Ordinances. The existence of external government support for UA projects within Kampala is similar to that of Toronto. Within both cities the hard-work of such agencies has been essential for the formal recognition of UA projects. Additionally, both Kampala and Toronto are fortunate to possess large numbers of urban dwellers, who have either immigrated or migrated from rural areas with ample agricultural knowledge and skills. These groups are an essential resource of UA projects as they can assist in educating new agriculturalists. These factors have increased the visibility of UA allowing urban dwellers to partake more freely in its activities as a food-security measure.

3.2.3. Types of UA: Kampala

Kampala possesses both intra-urban and peri-urban agriculture, offering residents increased access to nutrient rich foods. Although both intra and peri-urban practices are prevalent within Kampala, for the purpose of this report intra-urban agriculture will be evaluated along with four urban-agriculture household typologies, being: commercial, sufficiency/ commercial, food-security, and survival (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). These typologies were previously identified within the literature review while evaluating UA's economic benefits and motivations. This section will elaborate on these UA typologies, with discussions on their forms and features.

Intra-Urban Agriculture:

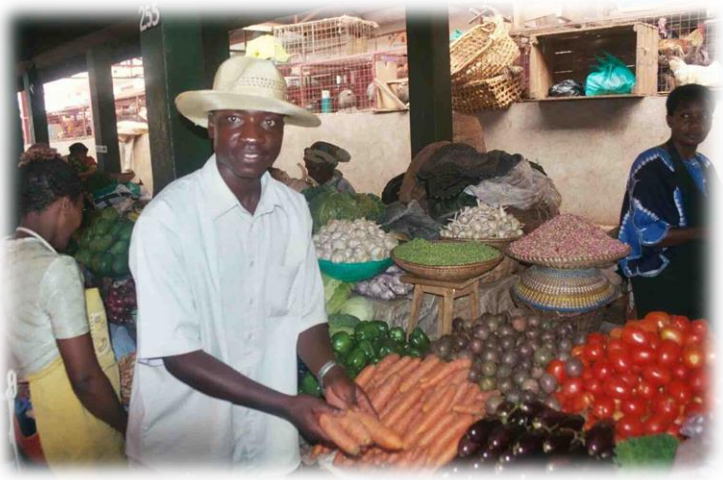
Intra-urban agriculture is participated in by a wide-range of urban dwellers including the urban-poor, middle-income, and upper income households (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). These practices are largely characterized by limited access to land, intense land production, and high rate of smaller commercial enterprises (Mawois, Aubry & Bail, 2011; David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). Although over 50% of urban land is used for farming activities, less than 20% of urban agriculturalists own the land they cultivate (Maxerll, 1995). Lack of land

ownership causes many to rely on informal means of access offering limited security (Maxwell, 1995). The main crops planted are: banana, maize, cassava, sweet potatoes, cocoyam, beans, and fruit trees using primarily organic fertilizers (Uganda. National Department of Agriculture, 1998). Due to high population density, roughly 50% of the crops planted are located on plots separate from farmers' residence (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). Poultry, cattle, and pigs are the most popular livestock within urban areas, with poultry being the most common (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). Popular locations for intra-urban plots, although discouraged by City ordinances, are along roadsides, within wetlands, and near farmers homestead (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). The average size of intra-urban plots are approximately one by two meters in size (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). Given the small size of plots, many choose to farm up to 6 plots depending on land availability (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010).

The four UA household typologies: commercial, food self- sufficiency, food-security, and survival allude to the main driver behind UA participation in Kampala and express its importance to social and economic stability. These typologies were first identified by Maxwell and are further discussed below (1994, found in David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010).

Commercial:

Intra-urban family-type commercial farms generally produce food for subsistence and for sale within the urban market (BeBon, Parrot &Moustier). These enterprises are generally run by well-off households given the need for access to credit (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010).These commercial food businesses are run by both men and women who own or lease the land used and is the least common form of UA (Maxwell, 1995). These commercial farms are found within urban settings as well as in peri-urban locations.



An urban farmer selling his produce at Katimba market of Central Kampala. Source: http://www.sln.org.uk/geography/images/Uganda/8.Kampala%20market.jpg

Food self-sufficiency/ commercial:

UA for food self-sufficiency is most commonly practiced by households for income generation with customary tenancy land access (Maxwell, 1995; David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). The food produced is used for household consumption, with excess sold in the market place for profit (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). This form of intra-urban agriculture is interesting as the agricultural lands have a long history of production and were only recently incorporated into the City through urban expansion (Maxwell, 1995).

Food- security:

This is reportedly the most common form of intra-UA in which households participate for family consumption rather than for market sale (Maxwell, 1995; David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010; DeBon, Parrot, & Moustier, 2010). The cultivation of these products is primarily done by women as part of their household tasks (Maxwell, 1995; David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010; DeBon, Parrot, & Moustier, 2010). This form is prevalent amongst all income levels and thus land tenure varies amongst participants (Maxwell, 1995).

Ugandan women harvesting pumpkins. Urban agricultural work is one way of reducing hunger and effects of poverty

Source: http://www.ug.undp.org/content/dam/uganda/img/MDGs/004.JPG/_jcr_content/renditions/cq5dam.web.300.200.jpeg

Survival:

Participation in intra-urban agriculture occurs as result of having no other means to support their household. Within this typology, women who have been abandoned or widowed are most commonly identified group (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). These women grow food on whatever land they can for survival. Access to land is generally gained through squatting or borrowing plots for cultivation (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010; Maxwell, 1995).

Non-Food motivations:

Although not commonly mentioned, some participate in UA for reasons of personal health, therapy, and leisure (DeBon, Parrot,& Moustier, 2010). However, unlike within Toronto these motivations were not as commonly identified.

3.2.4. Urban Agriculture and Food Security: Kampala

As a result of civil unrest and economic hardship throughout Uganda, UA became a critical mechanism for stabilizing household food security and preventing widespread malnutrition (Jamal, 1985 found in Maxwell, 1995). In Kampala women are the most active groups in urban agriculture, providing an additional income channel and supplementing household food consumption (Maxwell, 1995).

As noted in the above timeline, the legalization of UA within Kampala was strongly related to its role in increasing urban dwellers food security. Kampala City Council's

commitment to poverty reduction and food security is illustrated with their support for the Poverty Eradication Action Plan (PEAP), along with the Plan for Modernization of Agriculture (PMA). Both plans support the eradication of poverty by increasing the quantity of urban food produced and improving mechanisms of food production with the promotion of environmentally friendly Agro-enterprises (Ssembalirwa, 2008). The hope is to encourage a self-reliant urban community (Ssembalirwa, 2008).

Urban agriculture's importance to household income and food security is exemplified by participant's ability to reduce household spending on food products, in addition to long term nutritional benefits for children and other household members (Maxwell, 1995). On average non-farmers have been found to spend nearly twice as much of their household income on food products or $35-45 more/ month compared to urban farmers (Maxwell, 1995). Households who participate in UA activities (especially low-income) are better able to meet their children's nutritional needs translating into long term benefits for their growth and development (Maxwell, 1995; Maxwell, Levin,& Csete, 1998).

UA has provided participant households with an additional income stream, enabling increased food security and access to nutritional produce (Thom & Conradie, 2012). Research has found that in Uganda 70% of farming households earned more than the national income per capita, equal to US $330 or 590,000 Ugandan Shillings with 10% earning five times that amount (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010). These earnings reduce the burden of poverty and provide much needed funds for children's school tuition and family savings (David, Lee-Smith, Kyaligiza, Mangeni, Aliguma, Lobowa & Nasinyama, 2010).

Urban agriculture has allowed Kampala's urban poor to increase their households access to nutritious food products, necessary to battle malnutrition and its compromising health effects. Furthermore, urban farmers sale of produce within Kampala increases access to affordable nutritious products for the community as a whole, providing wide spread social and health benefits. It is therefore imperative that UA continues to be promoted within urban policy through supportive ordinances and planning mechanisms.

3.2.5. Urban Agriculture Regulatory Bodies: Kampala

The widespread participation in UA activities throughout Kampala has been largely supported by NGO's, IDRC, SIDA, and various international and local agencies. Although formal municipal government support for urban farming by the Kampala City Council (KCC) did not materialize until 2004, much progress has been made with the creation of Urban Agriculture Ordinances, supporting such practices as a means of increasing local food-security and household income. These ordinances provide a guiding framework for safe UA practices and regulations within Kampala. Oversight, regulation, and support of UA within the municipality falls under three main sectors and agencies: the Department of Production, Marketing and Environment; KCC Health Authority; and the National Agricultural Advisory Service (NAADS). The following provides a description of these bodies and explains their role in promoting UA within Kampala.

Kampala City Council and the Kampala City Urban Agriculture Ordinance:

In Kampala UA practices are guided by a set of Ordinances to protect and monitor food production and handing within the City (KUFSALCC & Urban Harvest, 2005). The Ordinances are an important planning strategy as they promote growth while safeguarding against health and environmental hazards. This is accomplished by requiring urban-farmers to obtain permits and/or licenses for specific activities, employing inspectors to monitor food and livestock production, and restricting areas where UA can occur (KUFSALCC & Urban Harvest, 2005). The permits are provided by the Kampala City Council after review of the application and site inspections have been completed by agricultural extension agents (KUFSALCC & Urban Harvest, 2005; Rockefeller Foundation, n.d).

Although these Ordinances are meant to promote food security and protect community and environmental health, low income groups may face financial (and at time literacy) restraints when attempting to obtain such permissions. If urban-farmers fail to procure the necessary documentation penalties may occur (KUFSALCC & Urban Harvest, 2005). Thus, such regulations may unfairly impact low-income groups lacking the same access to resources as middle and upper income UA participants.

Kampala's UA ordinances have set the tone for transformative change supporting local self-sufficiency through food security and poverty reduction. Although offering an innovative framework to support such change, current political and social realities have reduced their present impact. Firstly, there is a severe lack of agricultural extension agents compared to the number of urban farmers leading to processing and administrative delays (Rockefeller Foundation, n.d). The lack of agricultural extension agents has made accounting, training and monitoring of UA practices nearly impossible (Rockefeller Foundation, n.d.). Secondly, the local government suffers from transparency issues, making it difficult to obtain information on the ordinances (Rockefeller Foundation, n.d). Lack of access to ordinance information makes it challenging for urban farmers to follow municipal rules and regulations related to UA. Lastly, in conjunction with transparency issues, there exists little public education on the ordinances further reducing their guidance of present UA practices (Rockefeller Foundation, n.d.). In order to create an environment where these innovative ordinances can produce meaningful change these administrative, transparency and education shortfalls must be addressed by the Kampala City Council.

Department of Production, Marketing and Environment:

Urban agriculture in Kampala is a constituent sector of Kampala City Council within the Department of Production, Marketing and Environment (Ssembalirwa, 2008). The sector is made up of five sub sectors including: 1. Crop Production and Extension service; 2. Animal Production and Extension services; 3. Fisheries and Aquaculture Production and extension services; 4. Commercial Services, Trade and Cooperatives; and 5. Environment and Natural Resources (Ssembalirwa, 2008).

This Department is designed to support the Kampala City Council, the Poverty Eradication Action Plan (PEAP) and the Plan for Modernization of Agriculture (PMA). The Department aims to promote urban community self- reliance through increased food production and access with targeted environmentally friendly Agro-business (Sseembalirwa, 2008). The following four objectives were constructed to promote this goal:

> "1. Ensure improved quality livestock productivity which is environmentally secure for increasing incomes.
> 2. Improved food production for better nutrition and social welfare at

> household to district level and consequently to the national level for sustainable economic development.
> 3. Transforming livestock production for sustainable development
> 4. To facilitate the provision of adequate, safe and wholesome fish to city residents and realization of maximum sustainable economic benefits from the Fisheries sector without degrading the environment"
> (Sseembalirwa, 2008, p.2).

In addition to the Poverty Eradication Action Plan (PEAP) and the Plan for Modernisation of Agriculture (PMA), the Department is guided by the Republic of Uganda Government's Decentralization Policy, the Local Governments Act (LGA), the Fish Act, the five Local Government (KCC) Urban Agriculture Ordinances and the National Environment Statute (NES) (Sseembalirwa, 2008).

KCC health authority:

The Kampala City Council Authority (KCC) administers the delivery of health services through the Directorate of Health and Environment (Kampala. Kampala City Council, Health, 2014). In addition to dealing with health challenges related to a developing city i.e. malaria, infectious diseases, diarrhea, and respiratory diseases, the Authority enforces the Public Health Act and supervises food handling and food hygiene practices within the City (Kampala City Council, Health, 2014).

National Agricultural Advisory Service (NAADS):

NAADS is a semi-autonomous public agency under the Ministry of Agriculture Animal Industry and Fisheries (MAAIF). The agency was created in 2001 and is responsible for public agricultural advisory/ extension services (NAADS, n.d.). By an Act of Parliament, the NAADS Act 2001, the organization is required to provide agricultural advisory services for all Districts, Municipalities, and Sub countries of Uganda (NAADS, n.d.). The creation of NAADS by the Ugandan government illustrates its commitment to support UA activities and local farming practices (Rockefeller Foundation, n.d.).

The agency was created as a means to increase agricultural information, knowledge and improved technology among poor farmers in Uganda (NAADS, n.d.). The following five objectives support this goal:

> "1. To promote food security, nutrition and household incomes through increased productivity and market oriented farming
>
> 2. To empower all farmers to access and utilise contracted agricultural advisory services
>
> 3. To promote farmer groups to develop capacity to manage farming enterprises
>
> 4. To create options for financing and delivery of agricultural advice for the different types of farmers
>
> 5. To catalyze the participation of the private sector to fund agricultural advisory services"
>
> (NAADS, n.d.).

NAADS can best be understood as a pathway to transfer funds from the central government to impoverished farmers (Rockefeller Foundation, n.d.). KCC support for NAADS stems from its ability to promote UA through the purview of a market oriented enterprise (Kampala. Kampala City Authority, 2011/2012). The agency aims to support urban farmers and increase household food security and incomes by providing urban farmers with representation, guidance, and training within their Parish (Kampala. Kampala City Authority, 2011/2012). One of NAADS' initiatives was the promotion of backyard farming in various communities within Kampala, including the areas of Kisenyi, Katwe and Bwaise, as part of the Kampala Integrated Environmental Planning and Management Project (KIEMP) greening initiative and as a means to increase household income (Kampala. Kampala City Authority, 2011/2012).

UA practices have become entrenched in Kampala's society, making it a permanent feature of the urban landscape. Government and non-government support for UA within Kampala provides information networks, along with regulatory systems necessary for sustainable UA growth. The legislative and informational support from these and other organizations is necessary for safe and sustainable food production within the City. Although formal recognition of UA within Kampala has come a long way, practices would benefit from increased land security and funding. The following section will discuss UA needs for future growth and prosperity within Kampala.

3.2.6. Needs for the Future: Kampala

Although the Kampala City Council formally recognized UA contribution to food security and city greening in 2004 with the introduction of guiding Ordinances, urban-farmers within the city require further steps and support to ensure future growth success. As a result of research completed for this report I identified the following four needs: 1. secure land access; 2. education and technical knowledge; 3. Marketing initiatives and support; and 4. funding.

Secure land access:

The issue of land has been voiced by Kampala's urban-farmers as the biggest restraint to food production (Conway, 2006; Mougeot, 2000; Maxwell, 1995). In the City, land management is a complex blend of customary, colonial, and modern land tenure practices making land access "bureaucratic, time-consuming, and complex" (Conway, 2006, p.4; Maxwell, 1995; Kiguli, Nuwagaba, Mwesigwa, & Kiguli, 2003). High land values are an outcome of competition for land, placing UA in direct competition with industrial and building developments for land access (Conway, 2006). UA activities are often disadvantaged within this competition in terms of rent they can pay per m^2 of land. Such competition frames UA as a 'transitional' land use rather than permanent, threatening farmers land security (Conway, 2006).

The Kampala City Urban Agriculture Ordinances further restrict land access by limiting areas open to UA as a means of protecting: wetlands, greenbelts, road reserves, and drainage channels (Conway, 2006; KUFSALCC & Urban Harvest, 2005). Additionally, farmers who wish to grow on industrial sites, or other potentially contaminated lands, must first gain Council approval (Conway, 2006). Although these restrictions are in place to protect community and environmental health, they allude to the need for clearly defined land-uses which include urban farming (Conway, 2006). Such land definitions are necessary in order to promote farming amongst the urban poor who generally lack space for household plots (Convey. 2006).

Lastly, patriarchal customary land practices yield an additional gendered obstacle for women to overcome when trying to access land. Customary land practices dictate the automatic transfer of land titles from father to son or to the deceased husband's male kin (Conway, 2006; Kiguli, Nuwagaba, Mwesigwa, & Kiguli, 2003). This archaic practice greatly limits female's

access to land and leaves them dependent on male relatives. Women groups across Uganda are lobbying for reform in order to secure female's access to land (Conway, 2006).

Education and Technical knowledge:

A lack of education and technical knowledge was identified as a significant production constraint amongst urban-farmers (David, Lee-Smith, Kyaligonza, Mangeni, Kimeze, Aliguma, Lubowa, & Nasinyama, 2010). Lack of knowledge regarding the proper spacing and planting methods, along with crop and soil management were linked to a reduction in bean and maize crop yields (David, Lee-Smith, Kyaligonza, Mangeni, Kimeze, Aliguma, Lubowa, & Nasinyama, 2010).

Although the NAADS provides guidance for urban-farmers, it is clear that more technical training and education is needed in order to safeguard crop production. Urban-farmers would greatly benefit from group education and training programs as this would foster the transfer of knowledge between farmers, as well as provide insight from trained instructors.

Urban agriculture faces unique food production challenges as a result of population density, intense competition for land, and limited financing (Veenhuizen, 2006). In Kampala farmers have reported a reduction in yields as a result of: pests, disease, unreliable rainfall, shrinking land, and declining soil fertility (David, Lee-Smith, Kyaligonza, Mangeni, Kimeze, Aliguma, Lubowa, & Nasinyama, 2010). For these reasons UA would greatly benefit from innovative cropping technologies; however, these have been slow to appear in relation to rural (Veenhuizen, 2006; De Bon, Parrot, & Moustier, 2009). Adaptive technologies targeting urban growing conditions and restraints would provide necessary tools to increase productivity and broaden the skill sets of urban-farmers.

Marketing Initiatives and Support*:*

Urban agricultural activities are in continuous competition with non-agricultural economic activities for space and resources within the urban sphere. The accessibly to and distribution of water are prime examples of the struggle for resources between agricultural and non-agricultural urban activities (Molle & Beroff, 2009). It is largely authority's limited

comprehension of UA's environmental, social, and economic functionalities that results in such conflicts (De Bon, Parrrot, & Mouistier, 2009).

Water conflict centres on the modern day belief that water should be allocated towards higher value urban uses, rather than low value agricultural uses (Molle & Beroff, 2009). Although this debate generally occurs between urban activities and rural agriculture, with UA's increasing popularity similar sentiments are being echoed when discussing UA's access to valuable water resources. The debate is strongest in water scarce areas associated with percentages of populations lacking access to potable water supplies (Molle & Beroff, 2009).

Although concerns over urban population's access to potable water should not be ignored, the sentiment that UA activities further compromise access is not entirely true and reinforces its marginalization within the urban sphere. Firstly, agriculture tends to re-use waste water which is not suitable for drinking; and secondly, even a loss of water within a water short basin can be reclaimed and recycled down-stream, as it generally flows back to the river or aquifer (Molle & Beroff, 2009). Misconceptions regarding UA's misuse of water and potential health implication must be overcome in order for its practices to garner the necessary support for future development, removing it from the urban shadows.

Innovative marketing, branding, and quality labeling extoling UA social, environmental and economic benefits would greatly assist urban-farmers in overcoming market barriers and increasing public acceptance. Municipalities and health authorities play a crucial role in such projects (De Bon, Parrot & Mouistier, 2009). In Kampala permit requirements for UA activities are an excellent first step in ensuring quality of products for consumers; however, more resource and marketing support are needed to recognize and brand UA as a public good. Such branding would assist in securing its practices a space within the urban sphere.

Funding:

Financial and political support are necessary to increase UA's contribution to urban food security. Kampala's City Council has granted UA with legal legitimacy recognizing its role in urban food security, community greening, and local economy; yet, just as in many other African, Asian, and Latin American cities financial support has remained limited (Cabannes, 2012).

Within Kampala support for urban farmers generally originates from NGO's, international organizations, and the Kampala City Council (KCC) (David, Lee-Smith, Kyaligonza, Mangeni, Kimeze, Aliguma, Lubowa & Nasinyama, 2010). Micro-credit programs targeting urban-farming have increased somewhat; nevertheless, many urban producers still lack access to credit and investment schemes leaving them to develop their activities within a narrow scope of resources (Cabannes, 2009). Research carried out by the RUAF Foundation from 2008 to 2010, found that the majority of international donors and financial institutions still do not consider urban agriculture an essential issue; and within most national governments urban agriculture is incorporated within rural agricultural programs (Cabannes, 2012).

Financial support does not only refer to monetary funding, but also, non-monetary in the form of credits, subsides, and resources (land allocation, compost, fertilizers etc.). Earlier UN-Habitat/ UMP/RUAF studies found that credit programs do exist for UA however, the funds are generally allocated to livestock activities rather than vegetable crops (Cabannes, 2012). On the whole, credit institutions are reluctant to provide urban-farmers with loans due to: limited UA awareness; a perception that financing small scale agriculture is 'risky'; concerns about re-payments; as well as, concerns that UA is not profitable (Cabannes, 2012). Limited knowledge about UA practices and preconceived notions of small scale enterprises as a volatile investment reduce much needed credit opportunities for urban farmers. These notions also diminish resource support and land allocation as UA is seen as less economically viable than other urban economic activities.

Apart from international organizations, local governments have been found to assist urban farmers through subsides, technical training opportunities, and support groups such as those offered by the NAADS in Kampala. Within Kampala approximately thirteen organizations, including assistance from the KCC, were found to provide urban farmers with training and subsidy programs (David, Lee-Smith, Kyaligonza, Mangeni, Kimeze, Aliguma, Lubowa & Nasinyama, 2010). Although this support is needed, additional support providing and securing land and financing for poor urban farmers who fall outside of the institutions purview would go a long way to secure urban food production (Cabannes, 2012). Those farmers who lack access to financial institutions and local government programs tend to self-finance by: borrowing money from family or receiving remittances from family members abroad, joining rotating savings

systems, seek informal credits from suppliers of seeds, pesticides or fertilizers, and soliciting funds from non-institutional local money lenders (Cabannes, 2012). Borrowing from informal money lenders and suppliers can lead to poor urban farmers being trapped in a circle of debt due to high interest payments, leaving them vulnerable to financial risks.

Direct monetary financing in combination with indirect credit, subsides, and resources (fertilizers, compost, land security etc) are necessary to secure sustainable food production within the city. Sustainable urban food production is a public good as it not only increases food security for urban farmers, but also increases accessibility to nutritious food products for the community as whole.

3.2.7. Lessons Learned: Kampala

Urban agriculture has always been an important part of Kampala's urban landscape providing social, economic, and environmental benefits. The Kampala City Council's formal recognition of UA practices in 2004 led to the adoption of supportive ordinances along with the formulation of regulations and guidelines. These milestones allowed UA to become legally integrated within Kampala's landscape providing a strong foundation for the expansion of urban food security and community self-reliance. Although urban farmers require more land-security, agricultural education/ training, along with marketing and financing UA's long presence within Kampala's urban landscape has proved its resilience making it a permanent feature.

As first revealed by the literature review and further identified within the case study, urban farmers within Kampala are greatly motivated to participate in UA activities as a means to increase food security and household incomes. The widespread practice of UA for survival makes political acceptance of its practices essential for urban dwellers' well-being. UA within the City of Kampala has an advantage in comparison to other African cities for four main reasons; firstly, Kampala has the benefit of possessing a Poverty Eradication Action Plan (PEAP), as well as a Plan for Modernization of Agriculture (PMA). The existence of these plans is significant as they illustrate the local and national governments' commitment to poverty eradication, by increasing the quality of urban food produced and improving mechanisms of food production with the promotion of environmentally friendly Agro- enterprises (Ssembalirwa, 2008). Secondly, the IDRC, SIDA, along with various NGO's have worked tirelessly to raise

awareness of UA practices within Kampala. These efforts have drawn international attention and academic interest to UA's presence and essential functions within the City. The awareness raised through these efforts have assisted in placing pressure on Kampala's local and national government to formally recognize UA practices, increasing security for urban farmers. Thirdly, The Republic of Uganda's Decentralization Policy and Local Governments Act made local politicians more accountable to their constituents needs. The devolution of powers to Kampala's City Council provided the necessary conditions for the adoption of Kampala's five UA ordinances. Lastly, rural migration to Kampala continues to provide the City with residents possessing ample agricultural knowledge and skills necessary for UA's sustainability. Although gaps still persist in the areas of UA infrastructure, regulation, and monitoring these four features provide the necessary foundational support for moving forward.

Kampala's urban agriculture ordinances, along with corresponding policies and initiatives are among the first cases of policy response to urban farming practices by a municipal government in sub-Saharan Africa (Rockefellers Foundation, n.d.). Kampala City Council's framing of UA as an important food security measure rather than a public nuisance, has created an environment ripe for innovative change. With further support and targeted policy measures UA within Kampala has the ability to further increase food security and reduce poverty amongst urban residents.

3.3. Summation of the Toronto and Kampala Case Studies:

The analysis of UA practices within the cities of Toronto and Kampala provided the opportunity to examine UA's relationship to food security within developed and developing nations. This analysis was conducted in order to determine if and to what extent intra-urban agriculture contributes to urban food security within different geographic, economic, and cultural contexts. Toronto and Kampala were selected for this comparative analysis for the following two reasons. Firstly, both are the most populated cities of their respective countries; and secondly, their formal acceptance of UA practices have made them global leaders in regards to legal recognition and guidance of UA practices. The following will discuss UA's similarities and marked differences within the municipal boundaries of Toronto and Kampala. The overarching similarities detected revolve around the political acceptance and benefits of UA, rather than its

actual practice amongst urban dwellers. The differences identified are more pronounced, centered on temporal presence, participant motivations, level of food insecurity, and scale.

The City Councils of Toronto and Kampala have formally committed to increasing urban food security and self-reliance within their respective boundaries. This commitment is exemplified in Toronto with the Toronto Food Charter and in Kampala with the Poverty Eradication Action Plan (PEAP) and the Plan for Modernization of Agriculture (PMA). With these actions, both Toronto and Kampala have declared their support for policies that improve urban dwellers access to nutritious foods as a means to decrease food insecurity amongst their populations. These steps have led to municipal support for UA activities, along with enacting enabling policies and regulations within Toronto and Kampala.

UA's contribution to community greening and beautification, through the transformation of vacant and/ or abandoned urban spaces, has also been recognized by the municipal governments of Toronto and Kampala. The transnational ability of UA practices to beautify urban space and recycle urban waste makes it a valuable urban activity. As urban populations continue to rise, in tandem with food pressures and demands for sustainable urban practices, I predict that UA activities will be celebrated as valuable economic urban practice, rather than a transitional land use.

The multi-functional nature of UA activities within urban spaces of Toronto and Kampala categorize it as a public good. The inclusive nature of UA allows marginalized groups; namely, women, low-income groups, new immigrants, and migrants to take part in a meaningful social activity producing far reaching social, environmental, and economic benefits experienced by the whole community. UA contribution to urban food security, integration, community greening, and income supplementation/ savings assists is garnering much needed political and public support within North American and Africa.

The fertile lands and agricultural histories of Toronto and Kampala provide exceptional conditions for urban food production. The political and financial support necessary for the continuous growth of UA activities within their respective locations would not have been possible without the hard-work and dedication provided from NGO's, local organizations, community groups, and enlightened government officials. Continued support for urban

agriculture rests in urban farmers, local officials, planners, and policy maker's abilities to encourage the development of technologies and training targeting urban food production. Additionally, in order to increase much needed monetary and non-monetary support, these groups must vocalize the multitude of benefits produced by urban-farming to potential donors and agencies.

The above highlights overarching similarities between Toronto and Kampala's political acceptance of UA, stemming from its social, economic, and environmental contributions. Although similarities exists marked differences cannot be overlooked.

Firstly, temporal differences exist between UA practices of Toronto and Kampala. Within North America, the literature revealed that UA's role as a food security measure ebbed and flowed with economic (in)security. In times of economic crisis UA appeared as a coping mechanism, supplementing household food consumption; however, in times of security UA's presences greatly diminished. In contrast, UA has been a permanent feature within many African cities. Urban residents of Kampala have continually relied upon UA as a source of income and household food supplementation.

This temporal component is tied to the second marked difference related to levels of food insecurity within Toronto and Kampala. The exploration of Kampala revealed endemic food insecurity, in which urban residents rely on UA for their daily well-being. As discussed in the Food Security section above, endemic food insecurity is a result of limited availability and access to nutrient rich foods with damaging effects for individual and community health. In Toronto food insecurity is a marginal issue, with insecurity stemming from limited means rather than a physical lack of food supplies.

Thirdly, it is apparent that motivations behind participation greatly differ between Kampala and Toronto. In Kampala, the main motivation for UA participation is food supplementation and income generation. Although other motivations such as leisure and community strengthening exist, these are marginal in relation to UA's food security role. Within the relatively food secure city of Toronto, UA participation is driven by Alternative Food Movement narratives encouraging food justice, security, education, and environmental stewardship. Although food security is noted as a driving force behind participation, the absence

of endemic food shortages position it as a marginal motivation. Thus, in Toronto UA activities are generally constructed as preparation for the future insecurities, as well as an education tool for urban residents. In this context participation is greatly related to leisure, education, sustainability, and overall health.

Lastly, the scale of UA activities and participation greatly differ within Kampala and Toronto. As earlier noted, over 50% of Kampala's urban landscape is occupied by UA activities (Maxwell, 1995). This is an entirely different scale than that which exists in affluent cities. The scale of UA projects within the respective cities can be used as an indicator for measuring its relative importance to urban food security. UA's prominent land use position within Kampala eludes to its importance as an immediate food security strategy. When translating this argument to examining the much smaller scale UA activities within Toronto, it becomes clear that UA is not used as an immediate food security measure. This is not to say that UA's presence does not provide economic and social benefits for participants; but rather that it is not presently used to the same extent as in Kampala.

This leads back to the initial research question examining UA's relationship to food security within developed and developing nations. It becomes apparent that intra-urban agriculture practices do increase food security amongst urban dwellers by improving access and availability to nutrient rich foods, as well as creating income and employment opportunities. However, UA's impact on food security is intimately linked to its scale which varies greatly between developed and developing nations. The case studies examining Toronto and Kampala illustrate that UA's scale increases with levels of food insecurity; therefore, in developed nations where populations are relatively food secure UA is less of an immediate necessity and more of a strategy for future food supplementation and sustainability. Within this context food security is a marginal motivation for most participants but its practices still offer nutritional and economic benefits. In contrast, developing nations plagued by endemic food insecurity possess UA on a larger scale using its practices as a means to deal with immediate dietary needs. Within this context food security, along with income and employment generation are the primary drivers behind participation.

The following sections will employ the lessons learned to formulate recommendations. These recommendations provide present and future policy makers and urban planners of both

Toronto and Kampala with information on how they can further the successful integrate of intra-urban agricultural practices within their respective municipal landscapes and formal policies. Such integration is intended to produce community wide social, economic, and environmental benefits. These recommendations will be followed by concluding remarks.

Part 4: Urban Agriculture: Recommendations and Conclusion

4.1. Recommendations:

Based on the analysis the following recommendations are directed at what urban planners, policy makers, NGOs, and community organizations within Toronto and Kampala can do to successfully integrate urban agriculture within their respective municipal landscapes and policies. The recommendations are designed in response to the analysis findings and take into careful consideration the needs identified for sustainable urban agriculture growth within developed and developing cities. Although modifications will be required to meet culturally specific needs, these recommendations can provide municipalities and actors globally with a comprehensive guide for how to effectively incorporate UA within urban spaces of developed and developing cities to yield urban food security, social and environmental health, and economic growth.

The analysis and two case studies provided much insight into the benefits, needs, and barriers of urban agriculture within developed and developing countries. The similarities and differences detected have led to the creation of the following recommendations (Table 6) detailing how UA can be further fostered within Toronto and Kampala as well as on a larger global scale.

Table 6: Recommendations

Recommendations		
Toronto	Toronto and Kampala	Kampala
❖Amend zoning to include a separate land use category for urban agriculture. Designated urban agriculture zones will provide encouraging municipal policy and a recognized space for UA activities.	❖Encourage urban agriculture practices within municipal boundaries with formal land use policy changes. Urban planners can accomplish this by incorporating UA friendly policy within official community planning documents, as well as constructing targeted zoning and regulation amendments. Such official changes will encourage sustainable UA practices and safeguard against potential health and	❖Provide secure land leases to urban farmers on municipally owned land. Amendments to patriarchal customary land practices are also needed to protect female's access to land.

	environmental risks.	
❖Draft and endorse clear laws and regulations for urban food production and sale. These laws and regulations should encourage the sale of urban food products which meet health and safety regulations and work to reduce market access barriers. It may be necessary for the municipality to collaborate with the Ontario provincial government.	❖Amend building regulations and laws to encourage the incorporation of edible gardens and green spaces within new developments. Municipalities can accomplish this by providing incentives to developers.	❖Improve urban farmer's access to credit. Formal recognition of UA as an essential urban issue would increase international donors and financial institutions willingness to fund urban agriculture projects.
❖Provide all citizens, from school age to the elderly, with educational information on food production and consumption. Raising community knowledge of food systems increases local health outcomes and improves food consumption choices. This will further assist in re-integrating sustainable food production within city boundaries.	❖Increase UA's social value to reduce competition for resources; namely access to land and water. As a result of high urban land values UA is viewed as a transitional land use within developing and developed cities. This transitional status impedes its fair access to necessary resources. Increasing UA social value can be accomplished by completing an evaluation of UA practices within municipalities and a review of its contributions to the urban landscape. The quantification of UA's multifaceted benefits will heighten its visibility and urban value, broadening its access to land and resources.	❖Relieve urban food insecurities. Municipal and federal governments should collaborate to construct policies which reduce rural agricultural production of cash crops for export, instead encouraging the cultivation of food for local consumption.
❖Promote government and/ or private marketing campaigns to encourage urban dwellers to purchase locally farmed food products. This will assist in integrating UA products within mainstream food supply systems and reduce food import dependency.	❖Create land inventory to identify vacant and/ or underused urban spaces suitable to UA. Secure land leases and land identification provides UA with protected spaces for food production. Improving growers access to land provides urban farmers with the necessary security to invest in soil reclamation and composting translating into increased yields and urban food security.	❖Monitor UA activities occurring in restricted areas i.e. wetlands, road reserves, and drainage channels. UA practices within these areas should be required to conduct practices in such a way that prevents environmental degradation. Financial assistance from municipal governments or agencies may be necessary to assist low-income urban farmers established in these areas.
❖Create community groups. Encourage urban dwellers participation in urban farming with the creation of community groups to foster shared learning and social cohesion. These groups can be supported by the public or private sector.	❖Improve urban farmer's access to monetary / non-monetary funding. Differentiating urban farming from rural farming will assist in increasing financial support and targeting its unique needs.	❖Increase local knowledge of UA activities to reduce conflicts over urban resources i.e. land and water.
❖Support research examining the relationship between food security and UA. More research on urban agriculture and food security is needed within post-industrial developed cities to highlight its importance.	❖Encourage research examining new technologies specifically for UA. New technologies targeting UA's unique growing conditions will increase production yields and allow for more intense and sustainable growth.	❖Establish more concrete differentiation between urban land use zones. This will reduce risks of crop contamination.
❖Label food with how and where it was produced i.e. organically produced in the Okanagan Valley of British Columbia. This will assist in rebuilding the connection between food production and consumption.	❖Establish a central governing body to guide, monitor, and regulate urban agricultural practices within a municipality. A single governing body would reduce ambiguity, policy overlap and improve urban resident's access to resources, training, and guidelines.	❖Improve infrastructure (roads, sewage, drainage, etc.). This would allow for easier transportation of food products and goods, as well as create a more sustainable healthy environment.

❖Reduce barriers of participation by streamlining access to community gardens. Incorporate minority voices and needs within the Alternative Food Movement.	❖Ensure public safety. Public safety can be ensured by requiring urban farmers who wish to sell products to register with the UA municipal governing body. Registration would allow for easy monitoring of practices and increase urban farmers market access.	
❖Document crop yields and community consumption of UA products to measure its significance.	❖Provide education and training for urban farmers. Urban landscapes produce significant food production challenges for urban farmers. Given the challenges faced, urban farmers would greatly benefit from targeted education and training programs.	
	❖Encourage sustainable farming. Local authorities should encourage subsistence farming through programs supporting small-scale farming such as land identification, soil decontamination, fertilization, compost, pest control etc.	
	❖Lobby for governmental support. Urban farmers, NGO's and community organizations must lobby for municipal support and participate in the community planning process.	
	❖Utilize organic growing methods. Urban growers should make use of organic products and recycling of urban waste to garner further community support. Municipalities can encourage the use of organic methods within community groups, as well as, education and training programs.	
	❖Urban farmers and consumers should receive more information on environmental risks of UA.	
	❖Change modern understanding of the 'urban'. A paradigm shift is needed to alter the popular 21st century understanding of the 'urban' as being void of agricultural practices. For formal UA policies to transition into practice urban planners and policy makers must broaden their narrow understanding of 'urban' to incorporate food production activities. This can be done by increasing knowledge of UA's social, environmental and economic benefits.	

These recommendations provide guidelines for how urban planners, policy makers and group organizations of Toronto and Kampala can successfully integrate urban agriculture projects within their municipal boundaries. Although culturally specific modifications will be

required these recommendations can be applied globally to other developed and developing cities providing a foundation for meaningful change.

4.2. Concluding Remarks

The characteristics, function, and design of the 'urban' is often described in opposition to those of the 'rural'. This binary construction of the 'urban' and 'rural' leads to a dichotomous way of thinking dominating modern planning and urban design; consequently placing the terms 'urban' and 'agriculture' as antonyms. With rising urbanization creating global challenges for meeting nutritional needs of urbanites, preserving arable land from urban expansion, and creating sustainable cities promoting population and environmental health, such a rigid understanding of the urban is problematic. A growing number of urban residents, of developed and developing cities, are calling for a broader definition of the urban to include intra- urban agricultural practices. Within affluent cities of developed countries, support for intra-urban agriculture stems from the Alternative Food Movement; championed by calls for food-justice, nutritional education, environmental stewardship, and the desire to increase access of nutritional food products amongst low-income groups. Within low-income cities of developing countries, where intra-urban agriculture has always been a necessary feature of the urban landscapes, urban dwellers and organizations are calling for the formal recognition of agricultural practices.

Although it has been a slow process, this report has shown that municipalities globally have begun to recognize intra-urban agriculture for its social, economic, and environmental benefits. Such recognition have provided intra-urban agricultural practices more legitimacy, carving a place for its activities within urban environments. However, as the literature review and case studies illustrate more changes are required to enable its future growth in regards to: urban zoning, land-use regulations, financing, and re-evaluation of restrictive policies.

The main research question sought to examine urban agriculture's relationship to food security, to determine if and to what extent intra-urban agriculture practices contribute to food security amongst urban residents of developed and developing countries. Through in-depth research of urban agricultures overall community presence, with a close look at its social, economic, and environmental risks and benefits, the report found that intra-urban agriculture does have the capacity to increase food security amongst urban residents. However, this

capability is currently less exploited within affluent cities compared to low-income cities. The answer to this question opened up to a deeper understanding of the various motivations behind participation amongst and between developed and developing cities. The investigation reinforced the importance of critically examining the rise of UA and corresponding motivations in order to identify injustices and exclusionary practices within the alternative food movement. In addition, research identified the necessity of drawing out the differences between UA's practices, motivations, and participants within affluent and low-income cities to avoid constructing false parallels.

The report's findings provided insight into communities present and future needs for the development of intra-urban agriculture, not only for food security, but also for the overall ecological and population health of urban environments. The recommendations drafted above provide planners, policy makers, and group organizations with foundational strategies for the successful integration of UA within municipal landscapes and policy. Within cities of affluent countries, which appear to construct UA as a future source of food security rather than an immediate food security strategy, it will be interesting to witness how UA will further emerge within the present consumer market that is so intimately connected to global food systems. Additionally, the seasonality of North American climates create added barriers for year round dependence on UA production. The development of new urban farming technologies and marketing strategies will undoubtedly be helpful in overcoming these obstacles. In cities of developing countries, urban agriculture has had a more permanent presence within urban landscapes, appearing to grow in tandem with rising populations. It will be interesting for future research to uncover how UA will respond to increasing urban food demands stemming from unrelenting urban growth, limited infrastructure, and unreliable food networks.

The construction of this report offered the opportunity to explore intra- urban agriculture within the varying geographic, economic, and cultural contexts of North America and Africa. The ability UA possesses to reconnect urban dwellers to the sphere of ecology and food cultivation enables a new understanding of urban living, rescaling food supply chains. Future comparative research endeavors can build upon this work to further identify creative and innovative projects, charting successful alternatives for the creation of socially and environmentally just urban spaces.

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Appendix 1: Interview Respondents

Due to confidentiality agreements, I have replaced respondent's names with 'respondent #'. This has been done in order to protect participant identities. The following provides information on how respondents have been grouped, providing a clearer understanding of where respondents information stems from.

Respondent Number	Typology
Respondent 1 Respondent 2	These respondents are affiliated with either Toronto's municipal or provincial governments.
Respondent 3 Respondent 4 Respondent 5	These respondents are members of an UA private company or organization and also include free-lance academics/ researchers affiliated with Toronto, Ontario.
Respondent 6 Respondent 7	These respondents are members of not-for profit UA groups within Toronto, Ontario.

Appendix 2: Survey on Urban Agriculture

The survey's was constructed borrowing questions from Quon Soonya's report entitled: "Planning for Urban Agriculture: A Review of Tools and Strategies for Urban Planners" as part of Cities Feeding People Series Report 28. Additional open ended questions were formulated to tailor the survey to Toronto.

Project title: Urban Agriculture: Carving a Space for Agriculture in an Urbanized World.

PART I: PERSONAL INFORMATION

Name (Optional):

Male ☐ Female ☐

Age ☐ 18-30 years
☐ 31-40
☐ 41-50
☐ 51-60
☐ 61+

Began present job in year: _____

Job title: _____

Government department, agency or organization: _____

If government employee, what level of government?

City ☐
Region ☐
Country ☐

The name of the city, municipality or region that is the subject of this survey: _____

Please specify the boundaries of the area you will refer to (e.g. city boundaries, municipal boundaries, regional municipal boundaries): _____

PART II: SURVEY ON URBAN AGRICUTLRE

A. Understanding urban agriculture activities within official policy

Which, if any, of the following **agricultural activities are officially allowed** in your city?
(Check as many as apply)

☐ Do not know
☐ No agricultural activities are officially permitted in this city
☐ Growing vegetables and fruit
☐ Growing other crops for human or animal consumption
☐ Growing trees

- ☐ Growing flowers or ornamental plants
- ☐ Keeping small animals (e.g., rabbits, guinea pigs, chickens)
- ☐ Keeping large animals (e.g., goats, cows)
- ☐ Growing fish or seafood
- ☐ Production of other things (specify) _____
- ☐ Using waste water for irrigation
- ☐ Using household solid waste as fertilizer
- ☐ Using human waste as fertilizer
- ☐ Processing of city-grown products
- ☐ Marketing and distributing city-grown products
- ☐ Other activities_____

Which, if any, agricultural activities **do you think should be permitted**, that are not presently permitted in your city?

Do the policies of the city, municipality or region, you work in support urban agricultural activities? (e.g., location of activity, participants in activity) **Yes/ No/ Do not know**

Name any restrictions or conditions that apply to urban agricultural activities:

Is urban agriculture **mentioned** (either positively or negatively) **in the official documents** of your city?
Yes / No / Do not know

In which documents is urban agriculture mentioned?

- ☐ Official Community Plan policy statements
- ☐ District plan policy statements (if applicable)
- ☐ By-laws
- ☐ Provincial legislation or policy

Please name the responsible department or ministry_____

- ☐ Federal legislation

Please name the responsible department or ministry_____

____ Other _____

How would you **describe the official response** in your city to urban agriculture?
(Please check only ONE of the following)

- ☐ Do not know

Urban agriculture is:

- ☐ Supported and encouraged, but regulated
- ☐ Encouraged in policy, with few restrictions
- ☐ Permitted in policy, but with few support mechanisms
- ☐ Ignored
- ☐ Discouraged in policy, with few enforcement mechanisms
- ☐ Prohibited
- ☐ Enforced

☐ Not enforced ☐ Other _____

Do you think that the practice of agriculture is appropriate in your city? YES / NO/ DO NOT KNOW.

Please explain:

B. Locating urban agriculture and its activities

Where may urban agriculture activities officially occur in your city? (Check as many as apply)

- ☐ Not applicable, urban agriculture is not permitted
- ☐ Private residential property
- ☐ Public parks or open space
- ☐ Roadsides
- ☐ Utility and other rights-of-way
- ☐ Ditches
- ☐ Schools and institutional property
- ☐ Industrial or commercial property
- ☐ Other _____

Are there **areas where you think agriculture should or should not be allowed**? **Yes/ No/ Do not know** . Explain.

In your city's official plan policies, is urban agriculture recognized as a **land use category that is distinct** from other land uses? **Yes/ No / Do not know**

If no, is urban agriculture permitted under a different (broader)land use category? **Yes/ No / Do not know**

If yes, which land use category(ies) or zone(s)? (check as many as apply)

- ☐ Residential (specify)_____
- ☐ Commercial (specify)_____
- ☐ Industrial
- ☐ Institutional
- ☐ Park/Open Space
- ☐ Other _____

C. Regulating urban agriculture

Is any **government department or agency responsible** for urban agriculture control, regulation or guidance? **Yes/ No / Do not know**

If yes, what are the **names of the department(s) and/ or agency(ies)?**

D. Constraints to urban agriculture

What do you consider to be **the most significant constraints or barriers to urban agriculture** in your city?

How is urban agriculture promoted or facilitated in your city?

E. Urban agriculture activities in practice

Involvement/ location/ financing / benefits/ Infrastructure:

What are the main motivations for urban agriculture activities in your city?

- ☐ Save money
- ☐ Make money
- ☐ Subsistence
- ☐ Hobby
- ☐ Other (Please specify) _____

Who participates in urban agriculture activities within your city?

Are you a member of an urban agriculture organization or farmers organization? **Yes/ No**
Specify_____

If Yes:
Does your organization directly or indirectly participate in urban agriculture activities? Explain.

How many members participate in urban agriculture? How does one become a member?

Where do you, or others, carry out urban agriculture activities within your city?

- ☐ Roof tops
- ☐ Public plots
- ☐ Privately owned land
- ☐ Rented land
- ☐ Government owned land (school plots etc)
- ☐ Other (Please specify)_____

What is the size and scale of these activities?

Are these plots located within the city or along the cities periphery?

Do you ever receive any types of training, funding or assistance from the Ministry of Agriculture? **Yes/ No/ I Do Not Know**

What type of urban agricultural activities are you or your organizations members involved in?

- ☐ Vegetable and fruits
- ☐ Fishing
- ☐ Animal husbandry
- ☐ Ornamental plants
- ☐ Other_____

How many of the above mentioned crops do you or your organizations members have (by type vegetable/ fruit, fish, animals, plants, other)_____

Are these activities participated in year round? **Yes/ No**

Are you, or your organizations members, involved **full time** / **part time / Mixed**?

How long have you been actively involved in urban agriculture? _____

What types of farming tools are used?

☐ Hand tools ☐ Mechanical instruments

What is done with the waste from the garden and/ or animals? _____

Are any chemical fertilizers or pesticides used on the crops? **Yes / No** and Specify_____

Is there a record of how much is sold each year? **Yes / No**

What is done with the products produced?

☐ Personal use ☐ Sold ☐ Process or packaging ☐ Donate ☐ Other_____

If produce is sold, is it sold to?

☐ Restaurants ☐ Supermarkets ☐ Marketing agencies ☐ Households

☐ Street vendors ☐ Other_____

How often is produce sold?

☐ Dailey ☐ Weekly ☐ Monthly ☐ Other_____

How important is the food that members produce to their household in terms of providing food for their household?

☐ Very important ☐ Important ☐ Somewhat important ☐ Not important

Would you say those who participate in urban agriculture are able to eat healthier as a result of growing their own food? **Yes / No / Do Not Know**

What, if any, are the **main social benefits** of urban agriculture activities in your city?

What, if any, are the **main economic benefits** of urban agriculture activities in your city?

What, if any, are the **main environmental benefits** of urban agriculture activities in your city?

Infrastructure

How are the crops irrigated? _____

Is the land easily accessible? _____

Finance

How are the operations financed?

☐ Personal investment ☐ Credit ☐ Bank loans ☐ Fundraising

☐ Government Subsidies ☐ NGOs ☐ Other (Please specify)_____

Are subsidies available to urban agriculture within your area? **Yes/ No** _____.

How much do you or your organization members spend per year on urban agriculture activities?
$_____

Closing questions:

1. What are your thoughts or comments about urban agriculture in your city, and the role of urban and regional planners or other city staff in facilitating or discouraging urban agriculture?

2. What are the needs of your organization/ city in promoting urban agriculture?

3. In which socio-economic area is UA most prevalent in your community? (i.e. low/ middle/ high income)

4. What is the age range of participants?

5. How are the gardens managed?

6. Has the presence of UA been correlated with a decline in crime and vandalism in the areas they are located? If 'yes' please provide an example.

7. To the best of your knowledge are the UA projects you are aware of economically profitable? For whom?

8. Has the presence of UA in your area increased non-urban farmer's access to fresh produce and products?

9. What is the public opinion of UA in your area?

10. With the growing interest in UA have low income participants been displaced?

11. In terms of inspections: is there a governing body that inspects UA infrastructure to ensure proper materials are used?

The following few Q are in relation to regulations and legislation:

12. Would UA activities in your area benefits from being recognized as a land category distinct from other land uses?

13. What do you see as the positive and negative outcomes of recognizing UA through legislation?

The following Q are in regards to the future of UA:

14. Is UA in your area seen as supplementing or eventually replacing rural agriculture?

15. Do you or your organization see the future of UA as individual small scale or large corporate scale?

16. How do you see UA in your area in the next 10 years?

17. Do you have any additional comments regarding the topic and/ or this survey?

Thank you for taking the time to participate, please contact me at 438-823-4369 or kayla.pagliocchini@mail.mcgill.ca if you have any comments or concerns.