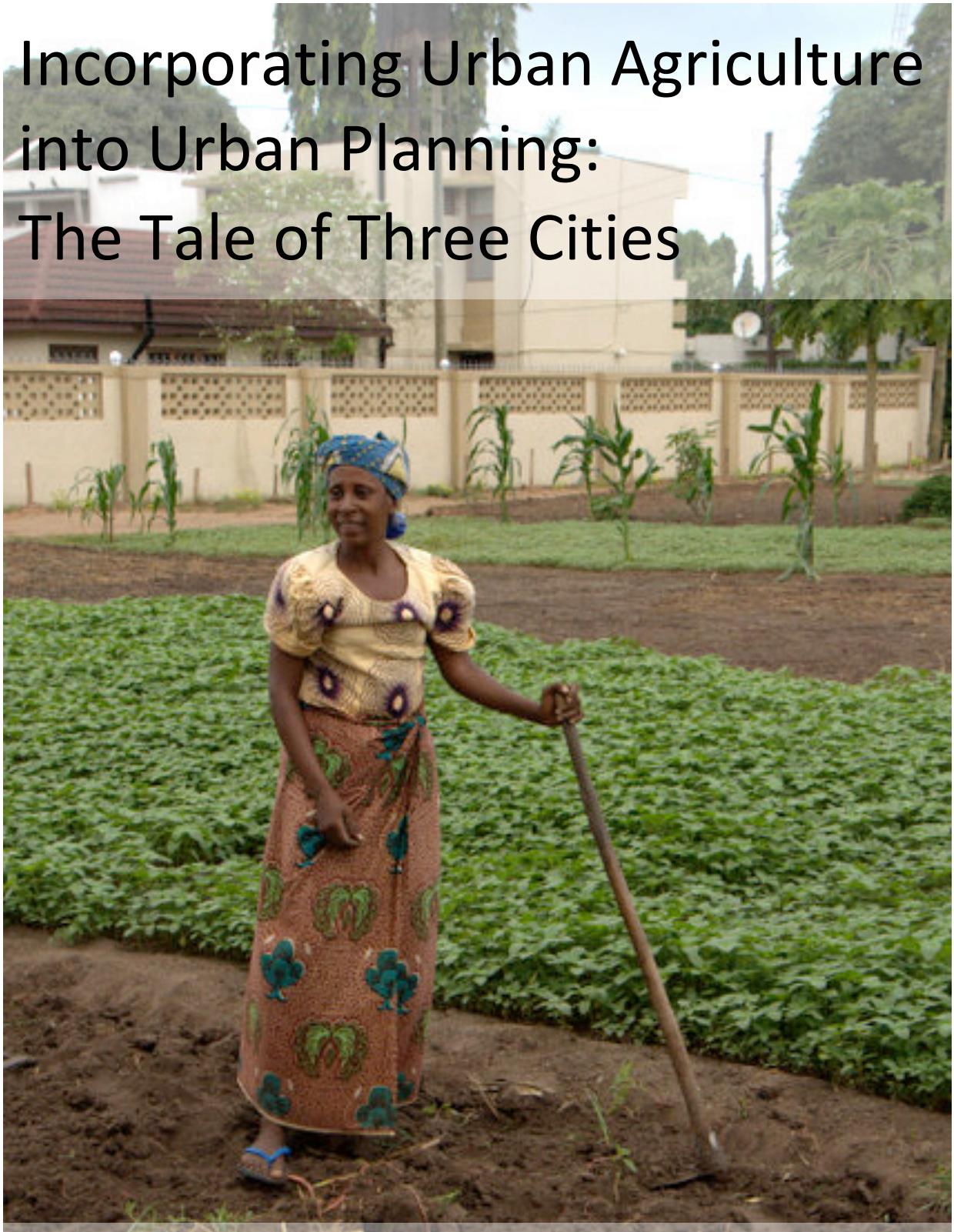
Incorporating Urban Agriculture into Urban Planning: The Tale of Three Cities



Independent Study
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Abstract

Although generally thought of as a livelihood strategy for the urban poor in developing countries, urban agriculture is prevalent in both the global South and North. Urban agriculture has been heralded for its environmental, social and economic benefits. However, in some cities it is an unrecognized practice and some typologies of urban agriculture are even treated as illegal.

Urban planning has an important influence in determining the structure of a city. This paper argues that urban planners are important stakeholders, which influence the successfulness urban agriculture legitimization and its incorporation into the urban environment.

This paper explores the influence of urban planning structures on the development of urban agriculture within three cities: Copenhagen, Denmark; Vancouver, Canada; and Dar es Salaam, Tanzania. Additionally, it outlines how the act of incorporating urban agriculture into urban planning structures can benefit urban farmers only when multi-stakeholder processes are implemented.

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Preface

Cities look to other cities for inspiration and often replicate one another. It was a series of conversations that I had with urban planners in Dar es Salaam, Tanzania that helped me realize that there is a knowledge gap in the relationship between urban agriculture and urban planning. For this reason I became increasingly interested in reviewing the practices of other cities in relation to how they planned for urban agriculture.

Although I have been continuously interested in Sub-Saharan Africa as my research focus, I recognize the importance of examining the urban agriculture strategies that cities use in order to encourage a knowledge exchange between cities, both in the global North and in the South.

The three cities of focus, Copenhagen, Vancouver and Dar es Salaam, were chosen because I have lived, as well as been involved in urban agriculture initiatives, in each of the three cities.

Definitions

Due to the scope of this paper, as well as the use of particular words and phases, it is important to define the terminology that is used within it. Definitions are provided below:

Urban Agriculture
An industry located within (intra-urban) or on the fringe (peri-urban) 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 (Mougeot, 2000).

Urban Food System
The series of interconnected activities that shape how food is produced, processed, distributed, consumed and recycled within the city. The urban food system is tightly linked to the regional food system (City of Victoria, 2010).

Food Security
When food is available at all times; that all persons have means of access to it; that it is nutritionally adequate in terms of quantity, quality, and variety; and that it is acceptable within the given culture. Only when all these conditions are in place can a population be considered "food secure" (FAO, 1996).

Food Systems Planning
The integration of food system issues into policies, plans, and programming at all levels of government (DVRDC, 2010).

Livelihood
A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base (Chambers *et al*, 1992).

Urban Planning
1) The branch of architecture dealing with the design and organization of urban space and activities and 2) *determining and drawing up plans for the future physical arrangement and condition of a community* (Princeton University, 2011).

1. Introduction

Cities today are experiencing unprecedented growth. Over the next 50 years the total amount of urban dwellers is expected to increase by 50% (Grimm *et al*, 2008). As population growth continues to shift to urban areas approximately 95% of the urban growth expected to occur over the next 50 years will occur in developing countries (ibid., 2008).

Cities in the South are already the most populous, as well as the most food insecure (van Veenhuizen, 2006).

Cities are net consumers of natural resources (Grimm, 2008), especially food. Providing food to cities is a major logistical challenge. Additionally, market changes, associated with high oil prices, as well as inflation of the price of food are other systemic challenges that must be addressed. Thus, urban agriculture is equally as important to countries in the South as it is to those in the North (IDRC, 2009).

The objective of urban planning is to ensure public access to basic facilities. This includes infrastructure, housing, roads, etc. Although food is also a basic need planners have only recently began recognised its importance in the urban context (Harris, 2008).

Planning plays a large role in determining the acceptance of urban agriculture within a city (Harris, 2008). It determines where it can happen, who can take part, the rules and regulations that govern the practices of urban farmers, how much public space will be allotted, and the zoning of land. Urban planners also influence how urban farmers use the land and what kind of activities they engage in. Thus, urban planners are often the ultimate determiners of how much or how little urban agriculture can be legally accepted within city limits (ibid, 2008).

Extensive research on urban agriculture has been conducted which discusses the importance of urban agriculture in social, economic and environmental sustainability. Urban agriculture is practiced in every city around the world, visible or hidden, and is both a recreational and livelihood activity (IDRC, 2009). It occurs on rooftops, in backyards, front yards, community gardens and open spaces. Still, many urban planners do not consider UA to be a legitimate urban activity (Dresher *et al*, 2009). Why is this so?

The traditional separation between “rural” areas as places for agricultural activities to occur and “urban” areas as centres for economic activity is no longer relevant in a modern context (IDRC, 2009). Urban agricultural activities are often dismissed as backwards, and as a fringe activity which has no place within the urban environment (IDRC, 2009). Most

cities in the global South, as well as in the North, tend to prohibit or restrict the practices of urban farmers since it is not considered a legitimate land use. There is great disparity between urban planning and urban agriculture (van Veenhuizen, 2006).

It is difficult to create one comprehensive solution to the integration of UA in the urban environment. Nonetheless, this paper seeks to examine examples from cities around the world in terms of legitimizing urban agriculture as a recognized urban activity and land use.

This paper argues that urban agriculture is an integral part of the urban environment, now and in the future, and cannot be ignored in planning processes. This paper also emphasises the importance of multi-stakeholder planning processes for integrating urban agriculture into urban planning.

The first section of this paper will examine the benefits and limiting factors of urban agriculture, as well as analyze the role of urban planning in urban agriculture.

The second section will look at the multi-stakeholder approach to legitimizing urban agriculture through bringing all actors to the table. The theory will then be demonstrated by two case studies from Dar es Salaam, Tanzania and Vancouver, Canada.

Thirdly, the three cities of analysis (Vancouver, Dar es Salaam and Copenhagen) will be introduced and a background on urban agriculture in these cities will be provided.

Lastly, a section on urban farmer typologies will briefly highlight the variety of urban agriculture within the cities of analysis. This will be followed by a discussion of the findings within the paper.

2. Objectives

1) To compare and contrast urban farmer typologies in different cities around the world
    a. Explore different types of urban agriculture land use

b. Examine differences and similarities between recreational and livelihood based urban agriculture

2) To examine ways in which agriculture can be incorporated into urban planning
   a. Examine the importance of multi-stakeholder processes
   b. Examine the processes of successful cities
3) To understand the consequences and benefits of incorporating urban agriculture into urban planning processes
   a. Compare and contrast the case of three different cities

2.1 Problem Statement

Incorporating urban agriculture into urban planning involves the input of a variety of stakeholders. However, the interests of key stakeholders, such as the urban farmers themselves, are often not taken into account. Nonetheless, if stakeholders are not involved in the correct manner, the process may be unsuccessful.

2.2 Research Question

How have major cities successfully incorporated urban agriculture into urban planning?

2.3 Hypothesis

Incorporating urban agriculture into urban planning can benefit stakeholders only when multi-stakeholder processes are implemented.

3. Methods

The core component of this paper is a comparative study between three cities: Copenhagen (Denmark), Vancouver (Canada), and Dar es Salaam (Tanzania). This comparison is to act as a basis to suggest when urban planning structures have influenced legitimization and enhanced support for urban agriculture.

3.1 Key Informant Interviews

The majority of the qualitative data in this paper was collected through key informant interviews. These interviews were semi-structured in nature and took place in person, over the telephone and/or via e-mail. The key informants include:

1) Henrik Vejre, Associate Professor - Department of Landscape and Forestry at the University of Copenhagen, Denmark;

2) Mie Søgård, Project Manager - *Københavns Madhus*, Copenhagen, Denmark;

3) Michael Levenston, Executive Director - City Farmer, Vancouver, Canada

An interview guide was developed to guide the interviews. A guide of approximately nine questions was designed to guide the interviews. By using a semi-structured interview format adaptations to questions could be made depending on the direction of the interview and the experience of the key informant. This arguably, allowed for more relevant data to be uncovered.

3.1.1 Justification for Key Informants

A variety of key informants were contacted, however, very few responded or had the time to engage in an interview.

For the Vancouver component of this paper Michael Levenston was chosen due to his experience with the Vancouver food system. Levenston, founder of City Farmer, a Vancouver-based urban farming organization, has worked with urban agriculture for more than 30 years.

For the Copenhagen section of this paper Mie Søgaard was chosen due to her current work with Københavns Madhus, an organization that works to promote sustainable eating habits amongst Copenhagen residents. Søgaard also wrote her master's thesis on "The Potential of Urban Agriculture in Copenhagen." Vejre was chosen due to his research on peri-urban areas outside of Copenhagen and his experience as a planner.

3.2 Action Research

Other primary sources for this paper have come from a six-month internship (February 2010 – August 2010) which I undertook. I acted as the urban agriculture project officer with Vancouver-based NGO, Sustainable Cities International in Dar es Salaam, Tanzania and helped to set up the Sustainable Cities: PLUS Network Africa Program Dar es Salaam Urban Agriculture Project. Many of the experiences and observation I made during this internship are represented within this paper.

3.3 Secondary Data

The literature reviewed in this paper comes from a variety of sources: Academic journals, NGOs, master's thesis', books, working documents, governmental/municipal laws and regulations, governmental websites and reports, conference proceedings.

3.4 Limitations

The research of this paper took into great consideration which primary and secondary sources were chosen. Nonetheless personal bias can occur. Having lived in all three cities I have formed my own opinions about how urban agriculture functions with in them. This may, in turn, have an influence on the paper and, as a result, the final conclusion.

All key respondents were eager to provide their opinions and thoughts on the matter. However, their responses were inevitably biased due to their position on the issue. Additionally, the responses they are given are greatly based on the work they have done in the field. In order to ensure the accuracy of this information it has been triangulated with secondary sources.

Due to time constraints key informants relevant to the content of this paper may have been overlooked. Since this paper focuses on three specific cities in three different regions of the world it is also important to consider that the comparison made does not necessarily reflect that of other cities, especially those in the same region. The conclusions drawn from this paper are specific to these three cities.

Additionally, due to the short amount of time dedicated towards this independent study (nine weeks) the focus has been narrowed leaving out very important discussion topics in urban agriculture, such as peri-urban agriculture.

4. Background

4.1 The Case for Urban Agriculture: Why Should it be a Part of the Urban Environment?

In the 21st century municipal and national governments have shown greater recognition of the importance of social, economic, and environmental sustainability within their cities. As the global urban population continues to grow exponentially, so does the need for food.

According to Mougoet “cities are centres for ingenuity and collaboration…. Urban populations are setting news standards and cities must reinvent themselves with new references” (2005; p. 2). Why is the city an important place to grow food?

Urban agriculture is often referred to as a livelihood strategy for the urban poor; however, we are now seeing global popularity for the practice spanning all socio-economic barriers (Drescher, *et al*, 2009; Mougeot, 2005). Undoubtedly, the research has shown the importance of urban agriculture in combating malnourishment and food insecurity, as well as increasing food sovereignty for those who are dependant on food imports. In fact, low income households are found to spend more than 50-80 % of their disposable income, on average, on food (ibid., 2009 & 2005).

For cities in the global North, like Copenhagen, Denmark, many of these issues are not relevant to the urban population, at first glance. Denmark, ranks as one of the most food secure nations in the world (Maplecroft, 2010). From an efficiency perspective it is arguable that it is a better use of resources to use the rural areas for food production (de Neergaard, pers. comm., January 10th, 2010) and leave the urbanized areas to specialize in areas of production, services and commerce.

However, there are other considerations other than efficiency and food security that those in favour of UA think should be made. Environmentally, UA has a role to play in global climate change through reducing transportation (Mugeot, 2005). Socially, it has helped contribute to bringing about social cohesiveness and creating a sense of community (Bellows, 2008; Mundel, 2008). Economically, it has helped to create institutional, organizational and private jobs for urban dwellers from all socioeconomic backgrounds (Deelstra *et al* in Bakker, 2000; Levenston, per.comm., Jan 6th, 2011).

In many cities around the world municipal governments have placed urban greening high on their priority list. (Kühn, 2003; Københavns Kommune, 2010a & b; Li, *et al*, 2005; Sousa, 2003;) Even metropolises like Bejing, China, have began implementing urban greening strategies, as they provide ecosystem services through the reduction of urban heat islands, oxygen production, air purification, regulation of microclimates, biodiversity, etc). It has been shown to benefit communities environmentally, aesthetically, recreationally, and economically (ibid., 2005).

UA has an important and multifunctional role within cities. All of the advantages of urban agriculture are applicable within both the global North and South. However, some are

more relevant than others, such as importance of urban agriculture as a livelihood in developing nations.

4.1.1 Limiting factors

If not managed correctly urban agriculture can also contribute negatively to the urban environment and its dwellers. However, it is important to note that many of these drawbacks are also prevalent in rural-based agricultural systems. Some of the limiting factors of urban agriculture include (Sawio, 1994):

- Leaching of solid and liquid animal waste into groundwater and waterways;
- Erosion;
- Noise and odour from animals;
- Heavy-metal/toxic substance bioaccumulation within plants;
- Use of domestic-use (treated) water for agricultural production;
- Potentially unattractive or unwanted within the city

4.2 The Role of Urban Planning in Urban Agriculture

Urban planners engage in land management, physical planning, land use policy/plans, public consultation, zoning, and municipal land development. They also influence the bylaws and other laws and regulations at the municipal level and act as an intermediary between citizens their local governments (Harris, 2008). All of these issues concern and influence the acceptance of urban agriculture under municipal policy.

Urban planners have slowly become more interested in engaging in urban agriculture and designing urban environments, which incorporate such components as community gardens, rooftop gardens, apiculture and aquaculture. In 2007 the American Planning Association came out with a set of guidelines that included urban agriculture. They wrote that: “Planners could play the following roles: Support the development of temporary farm stands, urban agriculture projects, and community vegetable gardens on school, park and community centre sites, and near public agency offices and non-profit providers offering health, human and social services. Promote the provision of community garden, urban agriculture projects and community kitchens in multi-family and low-income housing projects (APA, 2007).”

This is just one example of how urban planners in North America are beginning to recognize their role as stakeholders in urban agriculture. In recent years urban agriculture has been taken into consideration in recent comprehensive plans and neighbourhood

plans, such as those in Seattle and Vancouver. According the American Planning Association the role of urban planners in urban agriculture is the following, which corresponds with the (APA, 2010):

1. To address urban agriculture as a component of land-use and food policy in planning processes;
2. To create, enable, or fund community garden programs and urban agriculture organizations;
3. To create zoning and permitting processes that are friendly towards urban agriculture

4.2 Barriers

It has only been recently that urban planners have begun to be a part of the urban food system. In a 2000 study on food systems planning by Pothukuchi and Kaufman found that most planning literature ignores food issues completely. Up until recently, they note that major planning journals have generally overlooked food system issues. Their literature search was accompanied by a survey of 22 planning agencies in the United States. Of the agencies reviewed only one had significant involvement in community gardens. Only 18% had been involved in food related economic development and none were involved in agricultural land preservation.

Their findings were significant in telling the story as to why urban planning has avoided the urban food system for so long. The researchers grouped the seven reasons that planners gave as to why they were not engaged in the issue (ibid., 2000):

1. It is not directly related to their work;
2. It is not an urban issue, it's a rural issue;
3. The food system is driven primarily by the private market;
4. Planning agencies don't receive funding for food systems planning;
5. Food is already abundant in the city;
6. Lack of partners to collaborate with;
7. Lack of knowledge

As a result of this evident gap between urban agriculture and urban planning a relatively new field of planning, food systems planning, has arisen in North America. It has recently become a recognized expertise within the planning profession and a growing network of planners and their partners are engaged in strengthening the urban food system (DVRPC, 2010).

However, as widely demonstrated across the world, especially in the South, urban agriculture persists without the support of municipal authorities like urban planners (Descher *et al*, 2009).

4.3 The Role of Urban Planners in Copenhagen, Dar es Salaam, and Vancouver

With an upward trend towards rural-urban migration cities are trying to find new ways of addressing urbanization. In Vancouver, Canada urban planners have played an active role in incorporating agriculture within the city. For example, urban agriculture is a part of the City of Vancouver's Green Strategy (Levenston, pers.comm., January, 6th, 2010).

However, according to Michael Levenston of City Farmer, a Vancouver-based organization, urban planners have only recently been a part of urban agriculture in Vancouver.

According to the Director of Special Planning at the Ministry of Lands, Housing and Human Settlement, Tanzania, the role of urban planners is to zone land for agricultural land use. However, the Department of Spatial Planning does not feel obliged to locate areas to be zoned under agricultural use. Instead, they place the responsibility upon the urban planners at the municipal level as well as agricultural extension Each of the three municipalities in Dar es Salaam have now created strategic plans for how to spatially address urban agriculture (Bailey, pers.comm., May 24, 2011).

According to Herik Vejr, Lecturer in the Department of Forestry and Landscape at the Faculty of Life Science, University of Copenhagen, the role of urban planners should be the development and conceptualization of new ideas of how the fringe areas of the city can be used. He also notes that urban planners should also address the rural-urban divide and re-invent peri-urban agriculture. On a more practical level, he believes that planners should engage in the partitioning of land for new land uses.

Agreeing with Vejr, Levenston notes that planners need to designate new land for growing food. "If [planners] can plan for a park they can also plan for an urban agriculture area. If planners can help making land available, then the farmers will come" (pers.comm., January 6th, 2010).

According to Mie Søgaard of the Københavns Madhus municipal governments have the ultimate authority in governing how cities are run, but it is the urban planners that come up with the design of how the city should look. Therefore, their role in influencing urban agriculture, positively and negatively, carries a lot of weight (pers.comm. Jan. 14, 2011).

Planners are not the only key stakeholders in urban agricultural systems. In fact, the amount of players who are directly and indirectly linked to urban agriculture is immense. The section below will discuss the importance of multi-stakeholder processes in incorporating urban agriculture into urban planning structures.

5. Incorporating Urban Agriculture into Urban Planning: Building a Participatory Process

5.1 Multi-stakeholder Processes

Multi-stakeholder processes (Figure 1) have been recognised as an important element of policy design, action planning and implementation. They help to develop policies and programs that meet the needs of the city and those who live within it (Urban Harvest, 2010; Dubbeling, 2010). These processes involve a wide spectrum of stakeholders in order to ensure inclusive and successful implementation of urban agriculture development within the urban setting (Dubbeling *et al*, 2010; Mougeot, 2000).

Within the urban context urban agriculture touches on a variety of urban management areas. According to Dubbeling (in van Veenhuizen, 2006) these areas include land planning, environmental and waste management, economic development, public health, and social and community development. Due to the crosscutting nature of urban agriculture it also involves a diverse array of systems and their related actors. Stakeholders vary between cities, but according to van Veenhuizen (2006), they can include:

- Different levels of government
- Relevant departments and professionals
- Local leaders and village councils
- Private sector
- Academic organizations or research institutes
- NGOs, social movements, grassroots, and religious organizations
- Male and female producers and their organizations

Multi-stakeholder processes can help to increase the quality of decision-making by creating a better understanding about the priorities of those involved in the process. It can also improve the likelihood of implementing urban agriculture and create a more credible process (Hemmati in van Veenhuizen, 2002; Mougeot, 2000).

In the development of urban agricultural systems Urban Harvest recommends “to define the complex interactions between different urban systems and to involve all the interested stakeholders in a participatory process of consultation” (33, 2007).

When knowledge gaps are discovered it is important to address them through targeted education, demonstration and participation. This is essential, as many negative perceptions of UA are unjustified and not based on factual evidence (ibid, 2007).

However, effectiveness can only be achieved when the needs and priorities of the different stakeholders are taken into account. Additionally, the specific socio-economic and political-institutional context of each region of the city should also be addressed, as neighbourhoods and sections of cities may differ greatly (van Veenhuizen, 2006).

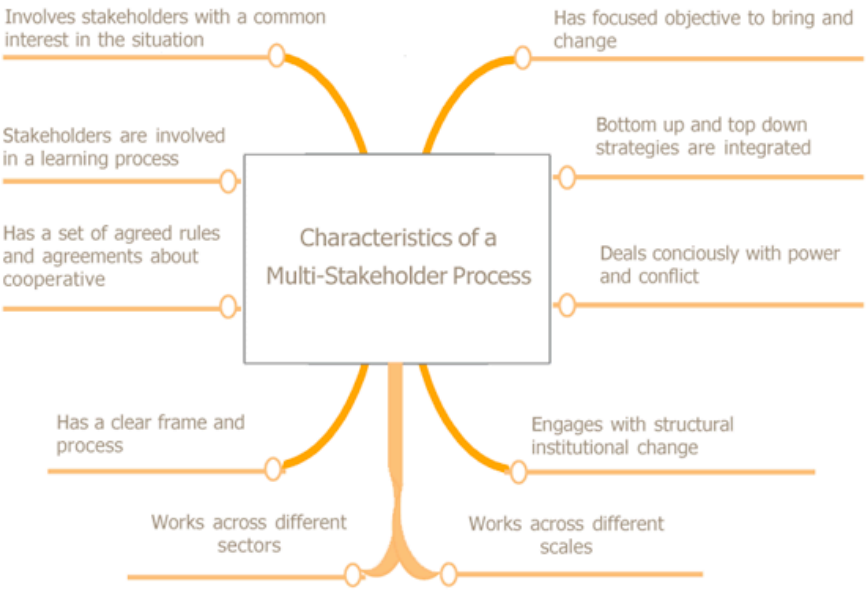

Figure 1 Characteristics of a Multi-stakeholder Process (Dubbeling in van Veehuizen, 2006).

Some of the drawbacks of multi-stakeholder processes include: specific financial and skilled human resources, time to allow for cultural acceptance of public participation in

decision making processes and imbalance in stakeholder influence (if transparency is not immediately achieved) (Dubbeling in van Veehuizen, 2006).

Here we look at two different methods of implementing multi-stakeholder processes, one from Vancouver, Canada and another from Dar es Salaam, Tanzania:

5.2 Case Study #1: Vancouver Food Policy Council

Vancouver Food Policy Council (VFPC) works to advise the Vancouver City Council on its food policy by acting as a liaison between citizens and civic officials. The VFPC is comprised of farmers, food distributors, nutritionists, processors, waste managers, activists, and academics, all of whom are highly engaged in the Vancouver food system (VFPC, 2011). It has been reputed as a functional and highly successful multi-stakeholder model (Dubbeling in van Veenhuisen, 2006).

According to the VFPC their primary goal is "to examine how our local food system operates and provide ideas and policy recommendations to Vancouver City Council on how it can be improved" (VFPC, 2011). The VFPC has been a fundamental part of creating the Vancouver Food Charter and Hobby Beekeeping Guidelines, establishing the 2010 Community Gardening initiative[1], and producing long-term plans for Vancouver's farmer's markets (ibid.).

Stakeholders have been discussing the idea for the VFPC since the 1990s. A Food Policy Task Force was set out to consult experts in urban food policy. It was through their recommendations the VFPC was create. The first action items that were proposed and supported by the City of Vancouver were a citywide food system assessment, rooftop gardens, community gardens, farmer's markets and coordinated food processing and distribution facility for low-income citizens.

Since the 1990s extensive research, training and consultation has been carried out in order to best understand how to address the five action items (Mendes, 2004).

[1] The 2010 new community gardens were established before the 2010 Winter Olympics in Vancouver as a part of this initiative.

The VFPC meets on a monthly basis at Vancouver City Hall. Their meetings are open to the public and public contribution is encouraged (VFPC, 2011). In terms of urban agriculture, the VFPC, along with the Vancouver City Council has been a major actor within the creation and governance of community gardens.

5.3 Case Study #2: Sustainable Cities: PLUS Network Africa Program

In 2010 the Sustainable Cities: PLUS Network Africa Program developed the The Dar es Salaam Urban Agriculture Project. Its primary objective is to legitimize urban agriculture within the urban planning system. The three-year project is aimed at improving the economic, social and environmental sustainability of urban farms by providing technical assistance and seed funding to contribute to urban farming activities. Additionally, it aims to facilitate participatory stakeholder engagement in order to effectively determine how to incorporate urban agriculture into the urban planning structure. It will also enhance the existing knowledge of the function of agriculture in urban environments through the research and documentation activities of the project.

Throughout the development of the Sustainable Cities: PLUS Network Africa Program Dar es Salaam Urban Agriculture Project a multi-stakeholder process took place and is still underway. In the initial stages of development stakeholder meetings were held between Sustainable Cities and individual stakeholders. These included (Figure 2):

- Urban planners (City of Dar es Salaam and Ilala, Temeke, and Kinondoni Municipalities);
- Agriculture Extension Agents (Dar es Salaam Regional Commission and Ilala, Temeke, and Kinondoni Municipalities);
- Urban Farmers (Six urban farmer groups (over 200 farmers) from all three municipalities);
- Department of Spatial Planning at the Ministry of Land, Housing and Human Settlements;
- Academics and Researchers (University of Dar es Salaam, IFAKARA Health Institute, University of Oregon, University of Freiburg, Cornell University, Sokoine University of Agriculture);
- Institutions (Canadian High Commission, Finish Embassy, Sustainable Cities: PLUS Network Africa Program partner cities in Dakar, Senegal and Durban, South Africa)
- Mikocheni B Vocational School

Figure 2 Some Dar es Salaam Urban Agriculture Stakeholders

Through initial interviews with individual stakeholders a communication gap between stakeholders was identified. An “Urban Agriculture in Urban Planning” workshop was held to facilitate dialogue between stakeholders. Additionally, a proposal for the Dar es Salaam Urban Agriculture Project was presented to the stakeholders for comments. The outcome of this meeting was an Urban Agriculture Action Plan for Dar es Salaam, which was used to guide the three-year project.

Four areas of concentration were agreed upon: 1) Policy and legitimization; 2) Capacity building; 3) Stakeholder engagement, and 4) Research.

6. City Profiles: A Comparison Study Between Vancouver, Copenhagen and Dar es Salaam

	Dar es Salaam	Vancouver	Copenhagen
Human Development Index (HDI) ranking (Out of 169)[2]	148th	8th	19th
Food Insecurity Index (Out of 163 countries)[3]	14th	159th	160th
Food spending (% income)[4]	70%	14%	15%
Population [5]	2,497,940	578,041	518,574
Land Area (km2)[5]	1,590	115	455.00
Population Density (people per km2)	1,793	5,335	2,592

6.1 Vancouver, Canada

The City of Vancouver has a population of 578,041 and relatively high urban density (City of Vancouver, 2011). Canada ranks high for national food security (Maplecroft, 2010), however urban food security in Vancouver, in certain neighbourhoods, can be relatively low (Dieticians of Canada, 2009). Canada is ranked high on the United Nations Development Program's Human Development Index (UNDP, 2011).

Urban agriculture, like in Copenhagen and Dar es Salaam, has had a long history in Vancouver. During WWII Vancouver residents cultivated allotment gardens, and to this day 44% of Vancouver's population is involved with urban agriculture of some form (City Farmer in Kaethler, 2006). Like the majority of cities, Vancouver is facing immense urbanization and development pressure. Thus, maintaining green space and a high standard of living within the city remains a constant challenge.

Urban liveability, the environment and social justice are priorities of the City of Vancouver. In developing these priorities the City of Vancouver has recognized the importance of urban agriculture, as it can offer the solution to the variety of urban problems (Mendes, 2004).

2 (UNDP, 2010)
3 (Maplecroft, 2010)
4 (Economist, 2011; Dieticians of Canada, Dieticians of Canada, 2009; RUAF, 2010)
5 (City of Vancouver, 2010; Københavns Kommune, 2011; RUAF; 2010)

Vancouver is often used in urban agricultural case studies. This is due to the immense support for urban agriculture within the city at the municipal, organizational, community, and household level. Vancouver is home to many non-profit organizations, community groups and a supportive city council, making it, comparatively, a positive political climate for urban agricultural initiatives to be carried out (Kaethler, 2006). Many grassroots actors have shaped urban agriculture in Vancouver.

Food security is an important issue in Vancouver. Although food is in relative abundance, access, distribution and income play a large role in determining the availability of food. Over half a million Canadians go hungry each day. For Vancouver, urban agriculture has presented itself as a solution to reversing urban food insecurity (Fairholm, 1998).

Please refer to Section 5.2 for the History on the Vancouver food policy council.

6.1.1 Barriers

According to Levenston, one of the largest barriers to urban agriculture in Vancouver is "all about land. Finding spare land, and getting the use of it. Great Vancouver is made up of 21 cities and the central one, Vancouver, has little spare land and it's worth millions. There is more land available in surrounding cities such as Richmond, Delta, Surrey and advances will be made there" (pers. comm., Jan. 6th, 2011).

The demand for community gardens is higher than the supply. However, more detail will be given to this subject in the later section on typologies.

6.2 Copenhagen, Denmark

Copenhagen is a city of approximately 500,000 people and has medium urban population density (Københavns Kommune, 2011). Denmark is a highly developed country and has amongst the highest national food security in the world (Maplecroft, 2010; UNDP, 2010).

In a literature search of urban agriculture in Copenhagen there were very few academic articles on the subject. Why is this?

Within Copenhagen Municipality there is a great emphasis on urban greening, but no mention of how urban agriculture can be incorporated into the city. Within the Copenhagen Vision 2015, one of four themes is to have a greener and bluer city (Københavns Kommune, 2010a; ibid., 2010b). However, the objective of greening the urban

environment is to increase recreational access to parks, not for food production (ibid, 2010a; ibid., 2010b: p. 14-15).

Søgaard argues that it is because of the high quality of life and, debatably, one of the best social systems in the world that Copenhageners do not consider urban agriculture due to high overall national food security and busy lifestyles.

From her 2010 master's thesis on the "Potential of Urban Agriculture in Copenhagen" Søgaard remarks that there is a potential for urban agriculture in Copenhagen and that there are relevant stakeholders willing to engage in the subject, such as the Municipality of Copenhagen. In fact, the first Copenhagen urban agriculture conference was held on May 18th, 2011.

According to the former Mayor of the Technical and Environmental Administration at the Municipality of Copenhagen, Bo Asmus Kjeldgaard, "Copenhagen has set itself the ambitious target of becoming the world's first carbon neutral capital by 2025. To meet this ambitious goal we need ambitious measures. Therefore we have now decided to ensure the City adapts to extreme weather conditions by making new requirements for getting grass on top of as many buildings as possible (Københavns Kommune, 2011)." As a part of this strategy the Municipality of Copenhagen has adopted policy that requires any new building with a roof slope of less than 30 degrees to have a green roof. However, food production on these roofs has not been taken into consideration by the municipality (Rasmussen, pers. comm., Jan. 19th, 2011).

6.2.1 Barriers

The political and social structure within Denmark has been generally top down. In other words Danes have become seemingly accustomed to having the government take care of them. According to Søgaard, Danes do not demand change and do not engage in as much grassroots activism, in terms of urban agriculture, as seen in North American cities (Søgaard, pers. comm.. Jan. 14th, 2011).

Søgaard explains that urban agriculture is a relatively new concept to Danes. Although urban agriculture has been carried out in allotment and community gardens, it is for novelty purposes (Søgaard, 2010). Even the word urban agriculture in Danish, *landbrug*,

literally means “countryside use”. Therefore, she argues that the most do not consider agriculture to be a part of the city (pers.comm., Jan. 14th, 2011).

One of the greatest barriers to urban agriculture within Copenhagen is soil contamination (Jan Rassmusen, pers.comm., Jan. 19th, 2011). Due to the long history of the city, soil remediation must occur before it is used for vegetable production. Some kitchen gardens have been vacated due to potential carcinogenic contaminants within the soil (SMF, 2001).

According to Søgaard, 92% of Copenhageners live in apartments (pers.comm., Jan. 14, 2010). This is can also be seen as a barrier preventing residents from engaging in urban agriculture in Copenhagen.

6.3 Dar es Salaam, Tanzania

As of 2010 Dar es Salaam is the 9th fastest growing city in the world with average annual growth (between 2006-2020) of 4.39% (RUAF, 2010). A recent study found the metropolitan population of Dar es Salaam to be 2,500,000, although this number is often disputed due to the fact that over 65% of the population lives in unplanned settlements (ibid.). Tanzania has a low Human Development Index ranking and comparatively low food security (Maplecroft, 2010; UNDP, 2010).

Urban agriculture in Dar es Salaam constitutes for 40% of the total informal and formal employment (Sawio, 1994). Approximately 90% of the vegetables and 60% of the milk available in the city comes from urban production (Dresher *et al*, 2009). Urban farmers in Dar es Salaam are not just the urban poor; Conversely, they cut across all social, economic, educational and cultural classes. Such a substantial contribution to the local food system is hard to ignore.

However, despite such impressive statistics “urban agriculture is not explicitly mentioned in all policy papers, but is affected by a number of laws and initiatives (e.g. Natural Resource Management, Poverty Alleviation, Employment Generation for Youth) (Jacobi *et al,* 2000; p. 19).”

Within the long-term national development strategy, Vision 2025, agriculture is recognized to have a central role in the national development of Tanzania. Julius Nyerere’s

government first promoted the importance of urban agriculture: Since the 1970s, food security through food self-sufficiency has been identified as an important national objective. According to Vision 2025 “food self-sufficiency and food security” is identified as an important step in achieving a “high quality livelihood” (United Republic of Tanzania, 1998).

Regulation of urban agriculture occurs at the national, regional and municipal level. Aside from national, regional, and municipal planning departments, the Ministry of Agriculture and Cooperatives also play a role in the rules and regulations that govern urban farming practices (RUAF, 2010).

According to the National Agricultural Policy of Tanzania "urban agriculture - although not considered a principal function of towns - has the potential to provide employment, income and is a supplementary source of food" (Sumberg, in Jacobi, *et al.,* 2005). Under the Local Government (Urban Authorities) Act of 1982 the role of urban authorities is to “regulate and improve **agriculture**, trade, commerce, and industry” (emphasis added). This Act also gave municipal authorities the right to make relevant by-laws (Mniwasa & Shauri, in RUAF, 2010).

Although the Act does not mention the role of urban agriculture outright, the National Food and Nutrition Policy of 1992 aims “to strengthen the procedures of obtaining and supplying food within the household, villages and towns by utilizing locally produced foods” (Mlozi *et al.* in RUAF, 2010). Nonetheless, under the National Policy “the Government will continue to regulate the conduct of urban agriculture and ensure that it does not disrupt planned urban development” (United Republic of Tanzania, 1997). Needless to say “disruption” of urban development is undefined under the Agriculture and Livestock Policy of 1994.

In addition to this the Human Settlements Development Policy of 2000 indicates the government will (p. 48):

- Designate special areas within planning areas whereby people will be granted legal rights to engage themselves in agricultural activities;
- Review existing laws to facilitate planned urban agriculture;
- Facilitate the construction of appropriate infrastructure to mitigate/prevent land degradation, water pollution and health and safety hazards in areas whereby urban agriculture is permitted.

The United Nations/World Bank Sustainable Cities Program, the German Agency for Technical Cooperation (GTZ) Urban Vegetable Promotion Project, International Development Research Council (IDRC), the Natural Resource Institute, and Sustainable Cities International have all contributed to demonstrating the importance of agriculture for sustainable urban development in collaboration with local agencies and institutions since the early 1990s (Sawio, 1994).

6.3.1 Barriers

Although national policy appears conducive to urban agriculture, the situation appears quite different at the municipal level. By-laws restrict urban farmers from raising four or more livestock. They also restrict farmers from cultivating permanent and semi permanent crops, such as maize, rice and sorghum (RUAF, 2010).

In order for Tanzania to remain true to its national policies the municipal by-laws that regulate urban farming practices must be updated to ensure sustainable urban agriculture in Dar es Salaam.

On paper the National Government of Tanzania has indirectly recognized the importance of urban agriculture in food security and improved livelihoods. However, there is still a long way to go in order to put policy into practice. According to an International Development Research Council Study inadequate technical extension, unrealistic by-laws, land shortage and some of the major constraints faced by urban farmers (Lupanga *et al,* 1991; Sawio, 1994).

7. Urban Farmer Typologies

Urban agriculture varies between cities and communities within cities. This section examines the different typologies of urban farmers. They range from backyard gardeners to open space farmers. Each typology utilizes urban space differently and with varying intensities (Figure 3).

Other researchers and organisations have tried to come up with their own methods of categorising urban farmers. Even fairly progressive cities, when it comes to urban agriculture, have only started to identify the different urban agriculture land users, or

typologies (Mendes, pers. comm., Jan 12th, 2011). This is difficult due to amazing variety of urban farmers and land uses, and the diversity of definitions of the term "urban agriculture".

In this section I have tried to identify the most predominant typologies. Nonetheless, there are emerging typologies that are difficult to categorise, such as guerrilla gardeners, due to a lack of research into their activities.

	INTENSIVE	LESS INTENSIVE
Extensive in Area	rural or periurban farms and associated agricultural activities	backyard and community gardens, limited livestock, and farmstands
Less Extensive in Area	urban farms, farmers markets, and composting operations	backyard and community gardens

Figure 3 Extensive and Intensive Urban Agriculture Land Use (APA, 2010)

7.1 Recreational vs. Livelihood Based Urban Agriculture

One common misconception is that urban is a livelihood strategy only used by the poor (de Neergard, pers.comm., Nov. 15th, 2010). On the contrary, people of all socio-economic classes practice urban agriculture. However, whether they generate profit from it or simply use it as a recreational activity is another question. Nonetheless, both recreational and livelihood-based urban farmers should have the right to access land in the name of food production.

For example, in Canada, the City of Vancouver has started promoting and recognizing urban farmers as potential entrepreneurs. There are urban farmers that cultivate their back yards and front yards and sell their produce to their neighbours, although questionable whether this falls under City of Vancouver by-laws. There are also urban farmers that cultivate a series of plots around the city that would otherwise be vacant and sell the produce at farmer's markets (City Farm Boy, 2011). This exemplifies that even a country with the 10th highest GDP (World Bank, 2009) in the world can be home to urban farmers that cultivate as a livelihood strategy.

Another example of this is Detroit, a city undergoing massive “ruralisation.” Detroit is home to some of the largest and most extensive urban agriculture plots in the developed world due to the downfall of the automobile industry in the city. Urban farmers have begun to occupy all derelict and neglected property to cultivate food (City Farmer, 2010).

Nonetheless recreational farmers are the most predominant typology in the global North.

7.2 Vancouver

7.2.1 Commercial Urban Farming

According to Micheal Levenston of City Farmer “The City is moving to support commercial urban farmers but there is so little spare land available in the City of Vancouver that this will be a challenge” (pers. comm., Jan. 6th, 2011). There are several gardens in Vancouver that generate an income. This includes SOLE Farm in the Downtown Eastside (DTES) in Vancouver, Canada, where 64% of the population is considered low income (City of Vancouver, 2009a). This area is best known as “Canada’s poorest postal code.”

SOLEfood Farm was developed to provide training and employment opportunities for people of the DTES community. The Farm grows and sells the produce to retail stores, farmers markets and restaurants (SOLEfood Farm, 2011).

SOLE food farm was a recipient of Vancouver’s Green Economy funding in 2009. A Vancouver City Planner states that this initiative “is part of an emerging green economy program that our department is developing. The green economy program report will go to Vancouver City Council in January 2010. It will have elements of urban agriculture, but it will also talk about green roofs and public realm infrastructure that can demarcate this neighbourhood as a green zone" (Vancouver Observer, 2009).

There are many other examples, such as this one, in Vancouver.

7.2.2 Community Gardens

According to Levenston, Vancouver planners have focused most of their efforts on community gardeners thus far (pers. comm., Jan. 6th, 2011). They define a community garden as “a place where people grow and maintain plants on City-owned property as a

community development and environmental enrichment initiative operated by a non-profit society (City of Vancouver, 2005).

The City of Vancouver permits community gardens anywhere within the city. The gardens are situated on public land and may be used by non-profit societies to produce edible and ornamental crops for personal use. If food is to be sold and used publically, then it must benefit cooking programs or be used for City of Vancouver approved economic development training opportunities (City of Vancouver, 2005).

Additionally, community gardens must include one or more of the following features (City of Vancouver, 2005; p.1):

- A community development program which encourages the involvement of local schools, youth groups, senior citizens, and others who do not have an assigned plot in gardening activities;
- An environmental enrichment program which offers demonstration activities to encourage urban agriculture outside of community gardens;
- Promotes an increase in environmental biodiversity and understanding of local food production;
- Contributes to growing food for charitable purposes;
- Represents the diversity of the community in which the community garden is located.

The demand for community gardens far exceeds the amount of community gardens the City has to offer (Kaethler, 2006).

7.2.3 Backyard/Frontyard Agriculture

According to one study on urban agriculture in Vancouver the backyard represents the most important space for urban farming in the city. The amount of space available in the backyards of Vancouver residents is equivalent to the amount of actively cultivated farm land in the province of British Columbia, thus exemplifying the high potential of urban cultivation (Bohn *et al*, 2005). Naturally, this is difficult to achieve due to the other land uses that may occur in one's backyard. However, it goes to show that agriculture is a relatively untapped resource with in the urban environment.

For those that do not have backyards due to the specific circumstances of their accommodation an online forum has been set up by City Farmer and the City of

Vancouver. It encourages those who have vacant garden space in their backyard to share it with their neighbours (City Farmer, 2011).

7.2.4 Animal Rearing

Urban chickens and bees can also be kept within the city. In 2005 the Health Bylaw was amended allowing hobby beekeeping to occur within the City of Vancouver. Guidelines for the management of the bees were also outlined by the City of Vancouver (City of Vancouver in Kaethler, 2006). According to the City of Vancouver urban apiculture is limited to (2005):

1. One and Two-Family Dwelling Districts;
2. Agricultural Districts on sites containing a one- or two-family dwelling;
3. A site containing a community garden;
4. A site where beekeeping will form part of an educational program.

A maximum of two beehives are permitted on a parcel of land less than 10,000 square feet and a maximum of four beehives can be kept on a parcel of land with an area over 10,000 square feet (City of Vancouver, 2005).

In 2009 the City of Vancouver created a bylaw that allows for the rearing of chickens in backyards. The bylaw states that four hens are allowed on one parcel of land despite the number of dwelling units. Each hen must be registered with the City of Vancouver and can only be used for personal use (City of Vancouver, 2009).

7.2.5 Rooftop and Open-space Agriculture

Although these typologies are not as abundant as backyard/front yard farming open space farming they still contribute to the urban foodscape in Vancouver.

The Rooftop Kitchen Garden (195sq m) at the Fairmont Waterfront Hotel supplies the hotel kitchens with fruit, vegetables, herbs and honey. However, other Vancouver residents are using their rooftops to cultivate vegetables. The City of Vancouver has also made it an objective to increase the amount of urban production on rooftops. There are over 24 rooftop gardens in Vancouver (City of Vancouver, 2009).

The University of British Columbia (UBC) Farm at the Centre for Sustainable Agriculture in Vancouver is a 24ha learning and research farm located on the UBC Campus. Although it

is a part of the university and is a student-driven initiative members of the wider community also use this space. It is the only working farmland in the City of Vancouver (UBC Farm, 2010).

7.3 Copenhagen

7.3.1 Nyttehaver (Kitchen Gardens) and Kolonihave (Allotment Gardens)

Since the 19th Century, Denmark has had a long tradition of cultivating vegetables in urban spaces. *Pauper gardens* were encouraged in cities by King Frederik VI to promote self-sufficiency of the working class due to the poor economic conditions that existed after the Napoleonic wars. In the beginning, many failed due to the lack of foresight of garden expenses and poor soil quality (Damin & Palmer, 2003).

However, in the late 19th Century private landowners began buying land and renting it to blue-collar workers to cultivate on the basis of individual contracts (ibid.). According to Damin and Palmer (2003) "The Industrial Revolution, country to city migration, poor housing, and an increase in population all contributed to this increased interest in allotment gardens."

In 1884, A Danish parliament member, Jorgen Berthelsen, tried to parcel government-owned land to working class urban dwellers. Other parliament members were not convinced, so Berthelsen leased municipal land on his own accord. Eighty-five plots were created and subleased to the *Arbejderforening af 1865* (Worker's Society of 1865). The government quickly changed their opinion after seeing how the gardens positively affected the worker's work ethic. This was the beginning of the first Allotment Gardens, and many are well preserved today (ibid. 2003).

Today, allotment gardens are primarily used as summer homes for Copenhagen residents. According to Henrik Vejre and Mie Søgaard, the allotment gardens are now used for growing mostly ornamental flowers, and little food production occurs on their grounds (pers.comm. Dec. 2010; Jan. 14th, 2011).

Nyttehave are similar to allotment gardens, but without the house. They contain a small shed and are used for vegetable production. According to Mie Søgaard many of those who

own allotment gardens in Copenhagen also own kitchen gardens, where they grow vegetables in the summer (pers. comm., Jan. 14th, 2011).

The City of Copenhagen is currently engaging in a plan to open up 250 new *Nyttehaver* in Copenhagen (Københavns Kommune, 2010).

7.3.2 Skolehaver (School Gardens)

Within Copenhagen there are eight different school gardens. The *Skolehaverforening*, or the School Garden Association, operates these gardens. These gardens give children an opportunity to cultivate flowers and vegetables during class hours and during their spare time. Each child has its own garden (Københavns Kommune, 2011).

In 2009 the Municipality of Copenhagen City Council released a budget dedicated to the creation of school gardens in Lersøparken. Approximately, 1.5 million DKK ($270,000 USD) was given to the creation of an orchard and gardens for schools that do not already have their own gardens on site (Københavns Kommune, 2011; Søgaard, pers. comm.. Jan. 14, 2010).

7.3.3 Kogræsserforeninger (Cow Driving Associations)

Kogreæsserforeninger are cooperatives, which graze cattle in a protected area, in order to maintain biodiversity in a given area and take part in their raising their own food (Figure 4). According to the Danish Nature Society marshes, meadows, grasslands and ponds are habitats that are disappearing from the Danish landscape. By grazing the cattle they help to increase the species richness of animals, insects, birds and plants by removing weeds and other unwanted plants. Within two of the administrative districts in the Municipality of Copenhagen you can find two Kogræsserforeninger (DN, 2010).

Figur 4 Sundby Kogræsserforening

In 2010, the Sundby Kogræsserforening had almost 70 members and 20 Hereford cows. The cows are raised according to Danish organic standards. To become a member individuals (or families) must pay a 50 DKK (approx. $9 USD). Each member has rights and obligations that they must abide by in order to get their share of the slaughtered meat at the end of the season. Members can sign up for one half, one quarter or one eighth of a share in a cow. For one quarter of the slaughtered cow (45kg of meat) the society estimates that it will cost the member 2,800 DKK (approx. $500 USD). However, this price varies according to a variety of factors (SKF, 2010).

The Danish Society for Nature Conservation supports various Kogræsserforening in Denmark (DN, 2010).

7.4 Dar es Salaam

7.4.1 Home Gardeners

In Dar es Salaam municipal land is zoned according to its potential land use. Thus, home gardening, or backyard farming, is not regulated (Jacobi, *et al.* in RUAF, 2010). According to a study by Jacobi *et al,* backyard farming is the most important type of urban agriculture in terms of the amount of urban dwellers engaged in the practice (Jacobi *et al*, 2000). Cultivation of vegetables at the household level is seen within all socioeconomic classes.

Home gardens are located on residential plots. Thus, security of tenure is dependant on whether or not the resident lives in a planned or unplanned settlement, and whether or not they have right to the land on which they dwell (Jacobi *et al*, 2000).

Although a City of Dar es Salaam bylaw states that there are only four animals allowed per household, a walk around any neighbourhood within the city indicates otherwise. During one walk around Msasani Peninsula in July 2010 a herd of cattle and goats could be found grazing football pitches, a large-scale poultry operation was seen, as well as a small-scale backyard dairy operation.

Access to water is one of the largest barriers for all urban farmers in Dar es Salaam; this is no exception for home gardeners. Those who can afford it can access tap water, but the majority of home gardeners do not have access to utilities such as water and therefore must use water captured in shallow wells. Those that use the latter method are restricted to cultivating between May and October due to a long dry season (Drescher *et al,* 2009; Jacobi *et al,* 2000).

7.4.2 Open space farmers

A considerable amount of urban farming in Dar es Salaam occurs in open spaces. Land tenure is generally insecure or informal (Jacobi, *et al.*, 2000). According to one study, vegetable production in open spaces in Dar es Salaam is carried out on road reserves, railways, power lines, schools, universities, army land, river valleys, industrial areas, and areas around human settlements (Figure 5) (Dongus, 2000).

The majority of these farms were established in the early 1970s during a time of economic crisis. President Julius Nyerere's government encouraged open space farming in Dar es Salaam as a nation building strategy. After 1975 there was a decline in open space urban farming, however, it has increased in recent years (Stevenson *et al.* in Jacobi, *et al.* 2000).

Nevertheless, the cultivation of perennial, or long-duration crops, and other investments in the land, may help farmers to dispute their rights to open-access land. For example, the Tazara-Mchicha Vegetable Farmer's Group in Ilala, Dar es Salaam was given permission in the 1980s to cultivate the land next to the repair station for the Tazara train line on the condition that they cleared the land. They were also given access to water for irrigation, but were required to pay for it. However, when the water became too polluted with

industrial waste, the farmers were no longer required to pay. To this day they are still cultivating the land.

Figur 5 Open space farming in the Msimbazi Valley

Short-duration crops (like amaranth or tomatoes) are generally planted due to a lack of security in land tenure. Those farming common land will often not invest in soil improvements, infrastructure, water harvesting techniques, or the cultivation of long-duration crops (Bakker *et al*, 2000; Dresher *et al,* 2009).

7.4.3 Community Gardeners

Community gardens in Dar es Salaam are common to high- and medium-density areas on public land. A community garden serves the purpose of both subsistence and income for the gardeners. Plots are generally found close to the residences of the gardeners and are usually larger than home gardens, but smaller than those in open spaces (Jacobi *et al*, 2000).

The formation of community gardens is, more or less, informal. However, members of these groups often pool their resources together and establish credit and savings, or pool money together during funerals, sickness and weddings (ibid., 2000).

For example, in Dar es Salaam a group of urban farmers, called “The Drive-in Group” (See cover photo) cultivates mainly *mchicha*, or amaranthus. Although, they were granted the

land by the Msasani Ward, (medium-density area of Dar es Salaam) the land can be taken away at any time due to the community garden's location in a road reserve.

When asked whether the farmers feel insecure of their land tenure, the leader of the Group presented a letter, which she had received from the Msasani Ward officer stating permission to use the land. This confidence is also demonstrated in fact that the farmers had a permanent borehole and water pumping system for irrigation[6]. Very few farmers in Dar es Salaam have access to clean running water for irrigation.

However, a representative from the Ministry of Lands, Housing and Human Settlement, as well as an urban planner from Temeke Municipality stated that the farmers would be asked to leave the land immediately without compensation if TANROADS were to widen the section of road.

8. Discussion

8.1 Urban Planning

Although urban planners are just one of many key stakeholders within the process of establishing urban agriculture in cities, they are very important due to their influence in fostering an understanding about urban agriculture, as they serve as an intermediary between government, politics and the community.

Urban planners everywhere are beginning to understand the importance of urban agriculture within their cities. However, there is still a long way to go. The barriers that were identified in Section 4.2 must be addressed. Firstly, this can be done through incorporating food systems planning into municipal planning profiles. Secondly, planners must be educated more on the issue in order to understand how the state or agriculture within the city is directly related to their work. Thirdly, planning agencies should engage themselves in creative solutions to sustainable development and incorporate urban agriculture within their innovation.

6 The borehole and pump were provided to The Drive-In Group through an election campaign strategy by the ruling party Chama cha Mapinduzi (the Party of the Revolution).

Opportunities to account for urban agriculture include: input to municipal plans and planning policy, use of tools and strategies to realise planning goals (zoning and zoning by-laws, urban land databases and urban baseline studies, environmental impact assessment, public capital investment, subdivision control, economic and other tools) (Harris, 2008).

The planning environment in Vancouver appears to be the most conducive to urban agriculture. Nevertheless, with or without governmental support and secure land tenure urban agriculture persists in all three cities Consequently, there appears to be no correlation between the extent of urban agriculture within a city and planners attitudes' towards the act. Planners in Dar es Salaam do not recognize urban agriculture as a legitimate land use, but approximately 40% of the population in engaged in it for a livelihood (Sawio, 1994). Comparatively, 44% of Vancouverites engage in recreational urban agriculture and their activities are recognised as legitimate and promoted by the City (City Farmer in Kaethler, 2006).

8.2 Multi-stakeholder Processes

In terms of Dar es Salaam, though participating in action research while working with Sustainable Cities in Dar es Salaam, it seems that another approach must be used to incorporate urban agriculture in the Master Plan. Since the 1990s there have been many NGOs working on urban agriculture issues in Dar es Salaam, as well as other cities in Tanzania. Little progress has been made, especially in the way of institutional change.

One potential way to do this is through creating peer exchanges amongst other African cities and those with similar development, like Durban, South Africa and Lima, Peru, who have come further in incorporating urban agriculture into their municipal planning structures (Dubbeling in van Veenhuisen, 2006).

Nonetheless, municipal peer exchanges should extend beyond the South. For instance, Copenhagen can learn from Vancouver, which shares a relatively similar climate, population and vision for sustainability. Many planners were not educated in a time where urban agriculture was not something they learned about. Thus it is important to keep those in decision making positions up to date with current trends in urban development and planning.

Sustainable Cities International Network is one model that could be used for connecting cities together. The Network is made up of “40 cities around the would who share best their learning and best practices about long-term planning for sustainability.” Member cities are committed to building on their existing planning process, as well as their long-term plans, which include 50-100 year visions, 30-year strategies and 5-year implementation plans. Members also identify one immediate demonstration project to engage in and participate in peer exchanges with other cities (SCI, 2011).

Food policy councils and food systems planning seems to be generally a North American phenomenon. Due to the well received nature of the Vancouver Food Policy Council in Vancouver and their role in advising the Vancouver City Council on food policy related issues, especially those concerning urban agriculture, other cities, like Copenhagen and Dar es Salaam can learn from Vancouver.

Although Copenhagen has the Københavns Madhus, which advises the Copenhagen Municipality on food issues, according to an interview with Mie Søgaard, it appears that there has been little in terms municipal influence on incorporating urban agriculture into the: “Things are changing. There are some positive things have come out of climate change,” says Søgaard referring to the slow increase in interest in urban agriculture in Copenhagen (pers.comm., Jan. 14th, 2010).

Additionally, multi-stakeholder processes only prove to work when each stakeholder is given the opportunity to voice their opinions on the matter. In the case of Dar es Salaam urban farmers are rarely consulted. In Copenhagen, there have been very few actors driving to bring urban agriculture to the table, thus the opportunity has not even been realized until recently.

8.3 Comparing and Contrasting Copenhagen, Dar es Salaam, and Vancouver

Each city experiences completely social, economic, political, cultural, and environmental conditions. There is a willingness to include agriculture within the urban environment within each city, however, as we can see from the findings within this paper that each city is on a different level when it comes to urban agricultural development.

In overall performance Vancouver appears to have the most urban agriculture-friendly political climate. Although planners have only recently come onboard, Vancouver has become world famous within the field. This is partially, due to the bottom-up and top-down approach that has been taken to legitimizing urban agriculture within policy and urban planning.

As presented within this paper, there are a variety of urban agriculture typologies, each adapted to the urban environment of each city. However, they all have a few things in common, they engage the local population and contribute to food security. They also provide ecosystems services to the surrounding landscape.

Each city is dealing with a different political climate and level of development. In terms of Dar es Salaam, urban agriculture is the most abundant, however, there are many political forces acting against legitimizing the act of urban agriculture. Dar es Salaam has the potential to become a model African city for urban agriculture. Currently, the majority of the city falls into the medium- to low-density category. Much of this land is and can be used for agricultural activities. However, over the current decade urban growth in Dar es Salaam is projected to double (UNEP, 2010). If left unplanned the city will experience rapid urbanization and urban sprawl, which in turn will reduce the amount of open space and community gardens within the city.

Nevertheless, various actors have tried to engage in establishing multi-stakeholder processes which have failed or been abandoned. Bureaucratic structures, lack of communication between stakeholders and lack of inclusion of stakeholders are often to blame. In this respect, the Sustainable Cities International: PLUS Network Africa Program's Dar es Salaam Urban Agriculture Project has been trying to find the best way to avoid a repeat of the past attempts of legitimizing urban agriculture.

As a city trying to become carbon neutral by 2025 it is difficult to believe how urban agriculture is not a part of the Municipality of Copenhagen's strategy. Copenhagen has been internationally acclaimed for its progressive attitudes toward climate change, yet it is only now that there is talk of the prospect of urban agriculture.

Due to the top-down, institutionalization of planning and political processes in Denmark Copenhagen could benefit from a more inclusive multi-stakeholder process. The predominant driving force for this process appears to be the Københavns Madhus. However, according to Søgaard there must also be a paradigm change within the Copenhagen population in order to accept urban agriculture as a legitimate land use.

Vancouver can always improve. Since the City has primarily focused on the development of community gardens there are other areas in which they can focus on such as increasing the number of rooftop gardens.

8.4 Opportunities and Future Outlook

In November 2010 this e-mail correspondence was received from Tiffany Tong, Sustainable Cities International: PLUS Network Africa Program Urban Agriculture Project office: "Each Municipality, through their Agriculture and Livestock Departments and the Town Planning Department have been working on their draft Urban Agriculture Legitimization Strategy Plans. The strategic plans compromise of the rationale for supporting urban agriculture in Dar es Salaam, the potential areas that can be demarcated for growing food in the city, and the criteria and regulations. These draft plans have been submitted to the Ministry of Lands, Housing, and Human Settlement Development for preliminary feedback. In late January, we will be organizing a stakeholders meeting to present the plans, to get comments, and then to finalize the plans for submission" (pers.comm. Dec. 3rd, 2010).

The Mayor of the Technical and Environmental Department in the Municipality of Copenhagen has also expressed interest in urban agriculture and incorporating it into the city (Rasmussen, pers. comm.., Jan. 19th,, 2011). On May 18th, 2011 Københavns Madhus hosted an urban agriculture seminar in Copenhagen. The Københavns Madhus is also working with schools to establish more school gardens and orchards within the Copenhagen Municipality (Søgaard., pers.comm. Jan. 14, 2011).

In 2010 a project aimed at developing viable urban agriculture farming businesses in Vancouver commenced. Although the project is just underway the next step is to place

urban farming into working groups and start developing a list of indicators for urban farming to allow the urban farmers to develop their business ideas (Regan *et al*, 2010).

9. Conclusion

With increased urbanization and global food insecurity on the rise cities around the world are looking for solutions. Extensive research has shown that urban agriculture can provide environmental, social and economic services for urban dwellers and their urban surroundings (van Veenhuizen, 2006).

Urban planners and municipal governments are the ultimate determiners of the look and function of a city. Their stake in urban agriculture is highly influential, but often ill-informed opinions of the practice has allowed for the potential of urban agriculture to be overlooked (Harris, 2008; Kauffman *et al*, 2000).

In order to incorporate agriculture into urban planning it is important to include all stakeholders. Various institutions and organizations have used multi-stakeholder processes to create a fair and equal platform for actors to voice their opinions (Dubbeling in van Veehuizen, 2006).

This paper argues that urban agriculture is an integral part of the urban environment, but its potential cannot be fully realized until it is accepted and legitimised by urban planners. In arguing this point three cities (Vancouver, Copenhagen, and Dar es Salaam) from three different continents with a variety of urban agriculture typologies have been analyzed.

In conclusion, both Copenhagen and Dar es Salaam have promising potential to incorporate urban agriculture into their urban planning structures and legitimize urban agriculture, but they also have a long way to go. Much can be learned from the process in which Vancouver has undertook to be where it is today in terms of urban agriculture. Together these three cities represent various levels of urban agricultural development.

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