PALACKÝ UNIVERSITY IN OLOMOUC

FACULTY OF SCIENCE

DEPARTMENT OF DEVELOPMENT STUDIES

Bc. Lenka Voleníková

Community Based Urban Agriculture in Southern Africa

Case Study of Ndola, Zambia

Master Thesis

Supervisor: Mgr. Zdeněk Opršal, PhD.

Olomouc 2014

I declare in lieu of oath that I wrote this thesis myself. All information derived from the work of others has been acknowledged in the text and in a list of references is given.

Olomouc, 9th May, 2014 .....

Signature

UNIVERZITA PALACKÉHO V OLOMOUCI
Přírodovědecká fakulta
Akademický rok: **2012/2013**

ZADÁNÍ DIPLOMOVÉ PRÁCE

(PROJEKTU, UMĚLECKÉHO DÍLA, UMĚLECKÉHO VÝKONU)

Jméno a příjmení:	**Bc. Lenka VOLENÍKOVÁ**
Osobní číslo:	**R120644**
Studijní program:	**N1301 Geografie**
Studijní obor:	**Mezinárodní rozvojová studia**
Název tématu:	**Community Based Urban Agriculture in Southern Africa: Case Study of Ndola, Zambia**
Zadávající katedra:	**Katedra rozvojových studií**

Zásady pro vypracování:

As urbanization rates are getting higher the biggest challenge for the future is to feed urban population. Developing countries are no longer able to provide sufficient food to theirs inhabitants. Therefore, urban agriculture becomes more and more significant not only in terms of food security and economics. This thesis is focused on community based urban farming widely popular in developing countries. Issues will be discussed as follows: introduction to urban agriculture, description and analysis of community based urban agriculture in region of Southern Africa, case study of Ndola, Zambia.

Rozsah grafických prací:	**dle potřeby**
Rozsah pracovní zprávy:	**20 - 25 tisíc slov**
Forma zpracování diplomové práce:	**tištěná/elektronická**

Seznam odborné literatury:

Bakker, N.; Dubbeling, M.; Guendel, S.;Sabel Koschella, U.; de Zeeuw, H. (eds.) (2001). Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda. Feldafing: DSE.
Hampwaye, G.; Nel, E.; Rogerson, Ch. M. (2007). Urban Agriculture as Local Initiative in Lusaka, Zambia. Environment and Planning C: Government and Policy 2007 [online]. Volume 25, pages 553 ? 572. Available at: http://www.envplan.com/abstract.cgi?id=c7p.
Smit, J.; Nasr, J.; Ratta, A. (2001). Urban Agriculture : Food, Jobs and Sustainable Cities [online]. 2001 Edition. The Urban Agriculture Network, Inc, 2001. Available at: http://www.jacsmit.com/book.html.
Van Veenhuizen, R. (ed.) (2006). Cities Farming for the Future ? Urban Agriculture for Green and Productive Cities [online]. Published by RUAF Foundation, IIRR, IDRC Available at: http://www.ruaf.org/node/961.

Vedoucí diplomové práce:	**Mgr. Zdeněk Opršal, Ph.D.** Katedra rozvojových studií
Datum zadání diplomové práce:	**22. ledna 2013**
Termín odevzdání diplomové práce:	**16. dubna 2014**

L.S.

Prof. RNDr. Juraj Ševčík, Ph.D.
děkan

Doc. RNDr. Pavel Nováček, CSc.
vedoucí katedry

V Olomouci dne 5. prosince 2013

ACKNOWLEDGEMENT

At first, I would like to express my gratitude to my supervisor Mgr. Zdeněk Opršal, PhD. for his valuable advice and patience. I am very grateful to Dave Richardson whose help was incalculable.

I would like to thank to Department of Development Studies which provided me with financial support in form of Vavrousek Stipend and to Palacký University for other funding.

A great thank you belongs to the RUAF Foundation and prof. Jacob Mwitwa from Copperbelt University who helped me with the arrangements of my research. Finally, I would like to help to the Henry Matola and Juliet Mutwale and all people who participate during the research.

ABSTRACT

Urban agriculture is an increasingly discussed phenomenon. Its importance has risen with the growing urbanisation rates of the developing world. Nowadays, cities are no longer able to feed their populations and urban agriculture represents a viable livelihood strategy for many poor households. This thesis describes the basic features of urban agriculture; namely the benefits and risks. The second part of the thesis is focused on community based urban agriculture where the top-down and bottom-up approaches are recognized. Finally, the case study of Ndola, Zambia is introduced. The socio-economic characteristics of farmers, their motivation for urban agriculture and the perception of the community and the cooperative are observed.

Key words: urban agriculture, community, cooperatives, food security

ABSTRAKT

Fenomén městského zemědělství se stále více a více dostává do popředí. Jeho význam roste spolu s rapidní urbanizací v rozvojových zemích. Celá řada měst dnes není schopná uživit své obyvatelstvo a městské zemědělství tak představuje jeden z možných způsobů pro chudé, jak ve městě přežít. Tato práce popisuje základní charakteristiky městského zemědělství, respektive hlavní příležitosti a rizika. Druhá část je zaměřena na komunitní městské zemědělství, přičemž jsou rozeznány dva základní přístupy: bottom-up a top-down. Poslední část práce představuje případovou studii města Ndola v Zambii. Ta se zaměřuje zejména na socio-ekonomickou charakteristiku farmářů, jejich motivace pro městské zemědělství a jakým způsobem vnímají komunitu a družstevnictví.

Klíčová slova: městské zemědělství, komunita, družstvo, potravinová bezpečnost

LIST OF ABBREVIATION

CBUA – Community based urban agriculture

CHVGS – Chipulukusu Vegetable Growers Society

FAO – Food and Agriculture Organization

FSTT – From Seed to Table

IDRC – International Development Research Centre

NGOs – Non-governmental organisations

MACO – Ministry of Agriculture and Cooperatives

MDP-ESA – Municipal Development Partnership Eastern and Southern Africa

RUAF – Resource Centres on Urban Agriculture & Food Security

SAPs – Structural Adjustment Programmes

UA – Urban agriculture

ZESCO – Zambian Electricity Supply Corporation

LIST OF CONTENT

OVERVIEW

Today, urban agriculture is becoming a significant phenomenon, especially in the developing countries. It greatly reflects the needs of urban populations in highly urbanized regions and it is a viable survival strategy for poor urban dwellers.

Despite the fact that urban agriculture is still quite neglected by development agencies and NGOs, it is slowly gaining reasonable recognition. Nevertheless, there is lack of research and the need for qualitative and quantitative data is urgent. Consequently, a comparison of individual cities is almost impossible as each case study is based upon different methodologies and the aims also vary. The situation is complicated by the fact that urban agriculture operates under diverse circumstances in each city.

The regional disparities in particular are the most obvious. In western countries urban agriculture is popular but not as a survival strategy – it is rather a form of relaxation. Conversely, urban farmers in the developing world are mostly motivated by a lack of capital for the fulfilment of their basic needs. While part of the developed world's population seems to be keen on urban agriculture as it expresses opposition to mass consumption, they have no idea about the urban agricultural practices of developing countries. This is even reflected in the available literature, especially where community-based urban agriculture is concerned. The literature mostly refers to the community gardens of the USA and Canada and neglects the community gardens of the developing world.

Community-based urban agriculture is one of the most popular forms of urban agriculture but it is neglected in the literature. Therefore, this thesis is focused on the region of southern Africa and the different forms of community-based urban agriculture. The cases of community gardens involving disadvantaged communities are referred to as well as the in-depth elaborated case study of a farmers' cooperative in Zambia.

1. AIMS OF THE THESIS

The thesis represents a comprehensive study of urban agriculture. All major aspects are discussed with a particular focus on the benefits of and threats to urban agriculture. The negative and positive aspects of urban agriculture are deeply interconnected and proper management is needed to avoid some of the risks. A complete understanding of all the driving forces and impacts is needed for the final conclusions.

The first part of the thesis is an introduction of the concept. Firstly, the definition is drawn and the significance of urban agriculture is highlighted. Then, the benefits and threats are discussed. Aspects of food security and health, socio-economic development and environmental impacts are depicted, as seen in the current available literature. Urban agriculture seems to be an important contributor to household well-being at all levels. First, it provides certain food security through direct provision of food. Second, urban agriculture generates additional income which allows households to purchase otherwise unavailable food. Third, it can improve the environment, especially in terms of urban organic waste recycling and the green cover.

The following section presents community-based urban agriculture, which is the most popular type of urban agriculture. Communities are seen as the impetus for development as it is assumed that collective action has a wider impact than the action of an individual. Two approaches to community-based urban agriculture are introduced. The top-down approach is characterized by the intervention of external agencies (NGOs, churches, governments) where the community gardens are more likely established with the purpose of including of disadvantaged communities. Urban agriculture is usually implemented rather than natural. Conversely, the bottom-up approach involves those communities where farmers have been familiar with urban agriculture for a period of time.

Finally, the case study of Ndola, Zambia is the essence of the whole thesis. The community of farmers in Chipulukusu, the oldest and biggest low-income area in Ndola, is introduced. The field research conducted by the author in the summer of 2013 focuses on the socio-economic characteristics of farmers and on their

perception of the community. The farmers' community was part of the From Seed to Table project initiated by the RUAF Foundation. During the research it was found that the cooperative was established but it failed when the participation of the RUAF Foundation and the Ministry of Agriculture was over. Thus, one of the specific objectives of the research was to discover the causes of the cooperative's breakdown.

2. METHODOLOGY

This paper contains both, primary and secondary sources of information and combines a compilation and analysis of the existing literature with field research. The primary data originates from the qualitative research conducted by the author in the summer of 2013 while the secondary data are from the available social science literature, case studies and other resources.

Chapters 3. and 4. are based on the secondary data analysis. The theoretical part is a review of the existing relevant and updated literature covering the issue of urban agriculture. The information for the thesis has been taken from studies written in English only. In the majority of cases the information has been retrieved from internet databases.

Chapter 5. is based on the field research mainly conducted by the author in the summer of 2013 in Zambia. The methodology, aims and the specific objectives of the research are described in detail in chapter 5.1. Research Methodology. There is also a description of the study site.

Both, direct and indirect quotations are used in this thesis. Direct quotations are distinguished by quotation marks and the text is written in italics. Longer quotes are written separately in new paragraphs. No quote used in the text is longer than one paragraph. If there is no citation, the statement is by the author alone. All literature used and other resources are listed at the end of the thesis in the Bibliography section.

3. INTRODUCTION TO URBAN AGRICULTURE

Urban Agriculture (UA) is a significant phenomenon which is spread around the globe. It is found almost everywhere – from Vancouver's rooftops to slums in Tanzania. Its importance increases with the level poverty of a country's inhabitants. Farming in Vancouver is usually a leisure activity, while in developing countries – especially Africa – urban agriculture is one possible survival strategy. Moreover, it greatly reflects urban dwellers' needs. With growing urbanization in developing countries, cities are no longer able to feed their populations. Therefore people look for ways to satisfy their basic needs.

This chapter describes the basic characteristics of UA. The most important possibilities and the risks are also mentioned.

3.1. Defining Urban Agriculture

Although UA is not a new concept, it has been neglected by policy makers and agriculturists as well as academics and development agencies. This attitude was changed by a Canadian based International Development Research Centre (IDRC) in 1983 (Tinker, 1994). All the literature on this issue is relatively new and scientists are still trying to find appropriate definitions. Probably the most relevant one is assigned by Smit, Nasr and Ratta (2001, p. 1) comprehensive study *Urban Agriculture: Food, Jobs and Sustainable Cities.*

> Urban Agriculture is an industry that produces, processes, and markets food, fuel, and other outputs, largely in response to the daily demand of consumers within a town, city, or metropolis, on many types of privately and publicly held land and water bodies found throughout intra-urban and peri-urban areas. Typically urban agriculture applies intensive production methods, frequently using and reusing natural resources and urban wastes, to yield a diverse array of land-, water-, and air-based fauna and flora, contributing to the food security, health, livelihood, and environment of the individual, household, and community.

Urban agriculture is characterized by its proximity to the markets[1]. Limited space in urban areas corresponds with high competition for land with other industries and economic activities (van Veenhuizen, 2006). Hence urban farming systems must be seen as a *"permanent and dynamic part of an urban socio-economic and ecological system"* (van Veenhuizen, Danso, 2007, p. xi).

While Mougeot (2000) concludes that UA is defined as much by its location but more by its connectivity to an urban economy, a social and ecological system, the definition mentioned above operates with the terms *intra-urban* and *peri-urban*. For a full understanding it is important to distinguish between these two concepts. *Intra-urban* expresses agricultural production within an inner city while *peri-urban* represents the agriculture and related activities on the city's fringe (van Veenhuizen, Danso, 2007). Tinker (1994) stated that it could be difficult to define the meanings of urban and peri-urban. She argues that growing cities often absorb existing villages where agriculture is practised naturally. Transportation also connects remote rural areas to an urban economy by market relations. Also a lot of urban dwellers own plots of land outside the city but bring their produce into the city. An interconnection between rural and urban areas is caused by urban sprawl, and an uncontrolled extension of the city to the rural areas (van Veenhuizen, 2006).

Urban agriculture is influenced by urban planners and policies as well as other activities which are undertaken in urban spaces (van Veenhuizen, Danso, 2007). Recently, UA has generally lacked public support, which is necessary for its development. Suitable policies can reduce risks and hazards connected to UA, such as the use of untreated waste-water or squatting on contaminated land. The attention of urban planners can resolve the struggle for land between UA and other urban based industries (Bryld, 2003).

[1] Distance to the market is discussed below in chapter 3.1.1. Significance of UA.

3.1.1. Significance of Urban Agriculture

UA significantly influences a city's informal economy. Smit, Nasr and Ratta (2001) state that UA is one of the most viable economic activities carried out in cities[2]. Despite its low support, UA produces goods valued in tens of millions USD. Some products, e.g. leafy vegetables, have a higher comparative advantage if they are grown in urban areas instead of rural areas. It is clear that the production of perishable goods is best carried out as close as possible to the consumer. UA is also more profitable than rural-based agriculture (Mougeot, 2000). Additionally, UA must be perceived as a complementary and not a competitive industry to rural agriculture (Mougeot, 2006).

Though its character is more informal than formal, UA also boosts urban employment rates (Smit, Nasr, Ratta, 2001). The rapid growth of urban populations means an increase in the demand for jobs. In the fastest urbanizing countries thousands of jobs must be created every year. Obviously, these cities are not able to provide a sufficient number of available jobs to theirs inhabitants. Thus the share of urban poor is rising (Nugent, 2000). Even though unskilled labour is the most needed, slum dwellers are often stigmatized and thus discriminated against in the labour market (UN HABITAT, 2012). In this case, UA can be seen as a self-employment opportunity.

There are few statistics and only a small amount of literature focused on UA. This means that almost all the data about productivity or involvement in this sector are usually based on expert judgement. Van Veenhuizen and Danso (2007) estimates more than 200 million urban dwellers are involved in market-oriented UA, thereby providing 15 to 20% of the global food. Concerning the total number of urban farmers, Mougeot (2000) states that nearly 800 million urban citizens are involved. More closely, it is estimated that more than 40% of all households in sub-Saharan Africa are engaged in urban agricultural activities and home-gardening is the most common in 11 of the 27 countries (FAO, 2012).

UA is also crucial to maintaining food markets in the cities of the developing world. Most of those countries are vulnerable to external and internal shocks

[2] In contradiction, Nugent (2000, p. 68) argues that if UA is measured officially, it does not create a substantial share of urban employment or GDP.

or crises – an economic crisis can affect a country's ability to import food, and civil war or land redistribution could be harmful to its domestic food production. The agricultural and export policies of a given country also play a role in crop orientation in domestic production (Mougeot, 2005). Because UA depends more on people's initiative than on government policies, it could serve as a helpful tool in times of crisis.

This phenomenon offers many significant opportunities and has a great deal of potential, as discussed below.

3.1.2. Urban Farmers and theirs Motivation

To understand the whole concept of UA it is necessary to acknowledge what is behind a farmer's decision to start practising agriculture in an urban space. The motivation is closely connected to the farmer's background. It is obvious that poor slum dwellers have different motivation to the owner of a poultry farm.

In general, most urban farmers belong to the low-income groups that live in developing countries. Subsistence and small-scale agriculture are the most common. The majority of farmers use land illegally (Smit, Nasr, Ratta, 2001). Women predominate in urban food production. There are several reasons: in developing countries women are perceived as the one who have to feed their families and take care of their children. UA usually means a job close to a woman's house, and thus she is able to fulfil her traditional childcare role and other tasks. It also serves as a perfect way to provide food for children and other household members (Mougeot, 2006). Thank to UA a women often get greater control over the household budget and decision making. Because mothers are usually more concerned about the future of their children, the re-distribution of income is more pro-educational (Mougeot, 2000). Although UA seems to be a great job for women, several constrains exist. Women often face challenges in gaining access to resources and services. Cultural background and prejudices can discriminate against women who wish participate in UA[3] (van Veenhuizen, Danso, 2007).

[3] Women are usually engaged in subsistence farming while men are more market-oriented. As a market becomes more competitive, women are often forced out of business. Women are disadvantaged

However, while UA could be seen as the occupation of the poorest of the poor, the reality is different. UA requires at least some capital, in the form of land or money. Poor people very often lack both and access to credit services is almost impossible for them. On the other hand, there are still urban farming systems which are low capital-intensive and special skills are not involved. Those farmers grow a variety of crops, such as leafy vegetables and root crops. Diversity does not require high access to resources in the same way as monoculture does and it is also risk-reducing[4] (Smit, Nasr, Ratta, 2001).

Agriculture in cities is often connected with rural-urban migration. According to common wisdom immigrants from rural areas take their best practices to the city and agriculture is something that they do know. Actually this statement is only partly true. Urban farmers usually originate from smaller towns and have been living in their current locations for several years, and often for decades (Mougeot, 2000). In his research, Sawio (1994) states that in the city of Dar es Salaam, nearly half of all urban farmers have been living in the city for between 10 and 20 years, 30% of farmers have spent more than 30 years there. Recent migrants who have arrived into the city within the last 10 years make up only 20% of all urban farmers. Newly arrived migrants do not dispose of needed capital, while residents do, or at least they can ensure access to the inputs more easily through connections which they have already built up (van Veenhuizen, Danso, 2007).

Banerjee and Duflo (2007), in their study *The Economic Lives of the Poor*, claim that food expenditure takes the highest share of total expenses in low-income households. Spending on food usually takes from 56 – 74% of all consumption[5]. It is not surprising that food security is the most common motivation for households to participate in UA. Urban poor are disadvantaged by limited purchasing power as their access to labour markets is low. Food security basically depends on the ability

---

by structural factors: lower education, less access to land and other capital, and fewer property rights (Hovorka, 2009).

[4] In the case of monoculture, there is a high risk of crop failure, while diversified systems ensure at least some yield.

[5] The share of food spending differs by country, depending on the price of consumer goods in that specific country. It is not surprising the most common motivation for a household's participation in UA is food security (Banerjee, Duflo, 2007).

to purchase food, which is complicated for a majority of low-income groups (Armar-Klemesu, 2000). Another impulse is to improve a household's economic situation. Small-scale farmers commonly consume a major part of their production and the surplus is sold. Thus, a household saves on food and has some additional earnings (Smit, Nasr, Ratta, 2001).

Farmers from middle- and high-income groups use UA to strengthen elements of their well-being (Bryld, 2003). Home-grown vegetables improve the value of consumed food and give a sense of personal satisfaction from successful cultivation. There is also economic motivation. UA is not as capital-intensive as other industries and it can attract entrepreneurs to start their business in agriculture (Smit, Nasr, Ratta, 2001). The production of perishable goods or high yield crops close to the market is more valuable than production in rural areas (Bryld, 2003).

Nugent (2000) concludes that the major motivating factors are economic. Based on a comparison of seventeen city case studies, she gives the following reasons for people to engage in UA: production for home consumption, income enhancement, economic crisis, high prices of market food, income or asset diversification and supplementary employment.

3.2. Benefits and Threats of Urban Agriculture

The characteristics of urban agriculture are not complete without a brief description of the main benefits and threats which are deeply interconnected. For instance, UA can improve the health status of the poor by providing better nutrition intake. At the same time it can be also harmful if incorrect practice is used. Both positive and negative aspects need to be looked at for a complex analysis[6].

Plenty of related problems also appear in rural areas. The higher concentration of inhabitants in cities makes these risks more visible. Due to higher population density in urban areas, the risk of animal contagious disease is more likely and polluted land has an impact on a higher percentage of population. Almost all threats can be resolved by proper policy action, such as promotion of best practices (Smit, Nasr, Ratta, 2001).

Health, economy and environment are the dimensions most affected by urban agriculture. All these segments will be discussed in the following chapter. Special attention is paid to food security and socio-economic impact and these topics are the heading for further chapters and a case study where theoretical concepts will be linked up with a more practical case study.

3.2.1. Food Security and Health

Health and sufficient access to food go hand in hand. These two aspects are also crucial for economic development and must be considered as fundamental to human capital where investment is needed. A healthy (and well fed) population is more productive than a malnourished representative an engine of economy in every single country (World Bank, 1986).

It is estimated that 25% of poor in developing countries live in cities. Poor people are urbanizing faster than the global population and poverty is becoming more an urban rather than a rural problem (Ravallion, Chen, Sangraula, 2007). Poor urban dwellers are identified as one of the most vulnerable to increase in food prices

[6] Obviously, regional disparity exists. While in South East Asia and China benefits are higher than threats because of sufficient policy support, in Sub-Saharan Africa where policies are basically weak and support for UA almost does not exist, risks connected to UA predominate (Voleníková, 2012).

(Zezza, Tasciotti, 2010). There is no simple way to feed cities during a time of crisis but urban agriculture can illustrate one.

An economic crisis is usually accompanied by food insecurity. A brief overview of history shows the development of urban agriculture within the context of structural adjustment programmes and unequal distribution of food in the 1970s and 1980s.

Food security[7] requires equal distribution of food worldwide and purchasing power (World Bank, 1986). According to Maxwell (1999) two major causes of food insecurity exist: the matter of overall food supply to African cities and structural adjustment programmes – SAPs.

The economic crisis during the 1970s and SAPs[8] in the 1980s had undesirable impact on food prices in developing countries. Public expenditure on the social sector was reduced and subsidies for food production were cut (Drescher, Jacobi, Amend, 2000). Food prices sometimes rose five times higher while real wages were devalued up to ten times. In many cases urban poor lost their purchasing power (Bryld, 2003).

In the short term, SAPs have worsened the availability of food in the cities by shock prices. In the medium term, this problem was solved, but temporary solution of food crisis has caused withdrawal of the issue of food security from the policy scene. Although food insecurity has become more acute, it remains invisible to policy planners in developing countries[9] (Maxwell, 1999).

Definitely, SAPs are not the only cause of the urban food crisis. Rapid urbanization is followed by population growth and cities have to deal with it. Urban expansion is fast-moving and the development of sufficient services and infrastructure is critical for food distribution. All these facts make urban food markets more fragile (Smit, Nasr, Ratta, 2001). Another relevant aspect of food security is price of food.

[7] Food security is defined as follows: "access by all people at all times to enough food for active and healthy life". This should be perceived as an investment to human capital which can ensure development of society (World Bank, 1986).

[8] Structural adjustment policies/programmes aimed to liberalize economies of developing countries during the 80s. Cuts in socially-focused policies as well as lessening of the state's role in the economy should help poor countries in their development (Riddel, 1992). SAPs were a politically sensitive and massive protest against these policies which occurred in cities in the countries with the highest urbanization rates (Maxwell, 1999).

[9] It is caused by three reasons: other (and more urgent) problems exist, e.g. unemployment and deficient services, policymakers pay more attention to rural food security than urban, and food security is seen mainly as a household-level problem and thus it does not require a solution on a national level (Maxwell, 1999).

The impact of SAPs on food prices has already been mentioned but also the food production chain is the essence. The increasing import of food from distant centres is caused by growing demand in cities[10] (Armar-Klemesu, 2000). There are many interventions during the journey of food to the household table. Each stage of processing adds extra costs and thus the price of the final product is advanced. Transportation and storage are the most costly parts of the whole process (Newland, 1980).

The supermarket model of food distribution has affected almost all aspects of food marketing in the cities. The result is clear – in poor urban neighbourhoods good shops and markets are missing (Armar-Klemesu, 2000).

Urban food insecurity is more urgent than rural food security. In rural areas the poor are usually able to obtain more food through home production and by barter so their expenditure on food is reduced. Therefore, income level is more crucial to food security in urban areas (Mougeot, 2000). Paid employment is the crux of the matter but many urban dwellers have jobs in the informal sector and their income does not cover all household expenditure. The poorest families are not able to buy sufficient and nutritionally valuable food (Armar-Klemesu, 2000).

In 1995 a case study from Nairobi (Kenya) was published. The data are based on a survey of 210 low-income households and its aim was to compare access to food of urban farmers and families who are not involved in UA. Although the amount of consumed food is not sufficient in any case, households which are engaged in UA are able to produce at least 20 – 25% of their own food consumption. Farmers do not greatly depend on food transfers and gifts (Mwangi, 1995). Other evidence concerning nutrition comes from Kampala. Maxwell, Levin and Csete (1998) found that UA is positively associated with a higher nutritional status of children in households where at least one member is engaged in farming. This finding results from an increased and more stable access to food and the ability of mothers who farm to pay more attention to childcare than mothers who are employed in other economic activities. Nevertheless the measurement of the share of home food production over total food consumption is more complicated. The role of home production varies with dependency

[10] Food is imported not only from rural areas but also from abroad.

on plot size, produced crops and consumption habits of a single household (Jacobi, Amend, Kiango, 2000).

Zezza and Tasciotti (2010) point out the unreliability of data on urban agriculture. They argue that much of the evidence related to UA is more qualitative than quantitative[11]. In their research available survey data has been compiled from 15 developing countries, with the aim to find empirical evidence on the impact of UA on food security. Even though the influence of income shares is not significant enough[12], in two thirds of the countries analysed UA has a correlation with food security. Direct access to wider a variety of food protects the poorest urban dwellers in time of crisis. Consequently, UA should be noticed by policy makers and urban planners.

Several approaches to food security exist but their sustainability is questionable. Governments usually promote food coupons, food aid, subsidies or price control. All of these strategies require some intervention on a state or even an international level (in the case of food aid). For all, UA is not a very popular strategy among local government but it is form of self-help strategy. UA is more cost-effective and more empowering than food aid (Smit, Nasr, Rattaa, 2001). By producing goods close to the markets the production chain is shortened (together with the number of interventions) and transport costs are reduced. All these factors cut the final price of the food (Van Veenhuizen, Danso, 2007).

Moreover, urban agriculture affects public health in several ways. Scientific evidence supports the hypothesis that UA is a tool which prevents urban food insecurity and provides better nutritional status for households involved. On the other hand, several problems exist. It must be mentioned that many of these health risks are connected to improper planning and technologies. The impact of urban agriculture on food security and nutrition has been discussed above. Thus this chapter is focused more on its negative aspects and possible preclusions.

[11] Most of the data used in literature are based on the author's observations and experiences. The authors of the study maintain that some often cited data are even anecdotal.

[12] Making the average across the population sample could be misguided, thus it must be emphasized that for certain groups of the urban population UA creates a sizeable share of their well-being (Zezza, Tasciotti, 2010).

Many health risks associated with urban agriculture exist. The most common are infectious intestinal diseases caused by contaminated food and poor preparation. Irrigation and wetlands within an urban space can attract anopheles mosquitoes and aggravate the malaria situation. Bronchitis and other respiratory problems occur if insecticides and pesticides are used without protective equipment (such as masks, gloves and appropriate clothing). The incorrect application of fertilizers and other agrochemicals can damage the health of farmers, the whole community and individuals (Smit, Nasr, Ratta, 2001). The most important health issues connected to urban agriculture are discussed below.

Relevant health concerns are mostly linked to pollution (chemical and biological) of food before harvesting and also to contamination at each stage of the production chain (Armar-Klemesu, 2000). We can find many toxins within a city which affect soil, air and water, all used for UA. Everything is clearly caused by industrial, commercial, residential and other urban activities (Smit, Nasr, Ratta, 2001), but the most intensive sources of pollution are road traffic, irrigation of untreated waste-water from factories, and squatting on vacant industrial land (van Veenhuizen, Danso, 2007). In many cases land can be contaminated by heavy metals (usually lead), pesticides, sulphur and nitrates (Armar-Klemesu, 2000). These pollutants mainly remain in leafy vegetable and crops with a longer growing period (Bryld, 2003).

Deelstra and Girardet (2000) argue that this situation can be influenced by appropriate management. The choice of a good plot of land is crucial. Farmers should avoid setting their fields closer than 10 metres to busy roads. Polluted land requires special precautions. These problems can be tackled by maintaining a high pH of the soil with the addition of plenty of lime. Also high organic material levels are important, thus organic fertilizers helps to immobilize heavy metals in the soil. The last step is the choice of crop varieties (see Bryld, 2003).

Another issue is the application of organic waste such as animal manure, urine and compost. It plays a significant role in nutrient recycling and performs as a reasonable fertilizer. Composting is definitely a favourable way of recycling organic waste but if the waste is not sorted out properly it poses a health risk (Armar-Klemesu, 2000). One example for all – in Egypt a situation was described when the distributed compost contained heavy metals thanks to inadequate waste

separation. It has an impact on public health as well as soil quality (Mougeot, 2000). Organic waste can also pose a health risk if manure from vector-carrying animals is applied (Armar-Klemesu, 2000) or composted materials contains high levels of human excreta (Cofie, Adam-Bradford, Drechsel, 2006). Additionally, when compost is managed badly, pathogens can be implanted into the soil. For example, parasite eggs and nematodes can survive the decomposition process and thus can be transmitted to the farmer's fields (Birley, Lock, 1999). Finally, waste-water is often used for irrigation purposes. In the developing world, 90% of all sewages flow directly to the rivers, lakes, streams and coastal waters. Thus the water is polluted by faecal coliform bacteria that cause intestinal diseases (Armar-Klemesu, 2000).

Urban agriculture is also criticized because of raising animals within the cities. Without questions, livestock is a large carrier of parasites, bacteria and viruses that can cause serious health problems (Armar-Klemesu, 2000). Contagion is mostly spread if the livestock is kept close to human settlements. Unfortunately, this factor is almost unavoidable due to insufficient grazing land. Proximity to a slaughter house also presents a risk to public health (Mougeout, 2000).

Even though urban agriculture seems to be critical to public health, it is important to mention that all these problems can be found in rural areas too. Some of the threats can be resolved by intervention from the policy makers, urban planners and NGOs. Obviously, mitigation is often expensive but low-cost, effective solutions do exist. For example, biological treatment can remove pathogens and bacteria from waste-water. The combination of sunlight, time and algae or duckweed is essential. The rest of these plants can later serve as organic fertilizer or animal feed (Smit, Nasr, 1992).

3.2.2. Socio-economic Aspects of Urban Agriculture

What makes urban agriculture special is not only its contribution to urban food security, but also its answer to structural unemployment and thus poverty reduction. It is almost impossible to measure the impact of UA on the total GDP of a given country or even city, because agricultural activities in urban areas are, for the most part, the business of the informal economy.

In general, the presence of agriculture in urban areas of the developing world is related to structural changes during the 1980's. The impact of SAPs on food security, availability and access to food respectively, has already been discussed in chapter 3.2.1. Food Security and Health. This period of time was followed by a decline in real wages due to the fall of the urban formal economy, wage freezes, the drop in urban employment and the increase in food prices (Maxwell, 1995). In consequence, the wage levels of the urban poor were so low that an increasing number of city dwellers were unable to satisfy their basic needs. This situation has led to the search for possible new survival strategies including urban agriculture (Ellis, Sumberg, 1998).

No doubts urban agriculture is one income source but the measurement of income level earned by it is complicated. Although some survey data related to earnings from urban agriculture can be found in literature, it is somewhat risky to generalize these findings because of the diversity of the whole phenomenon[13] (Nugent, 2000) and it is simply impossible to apply data from Vietnamese urban farming to Zambian reality. Still, it is possible to recognize different strategies regarding urban agriculture.

Moustier and Danso (2006) classified urban agriculture into four categories, which reflect its location, scale and orientation. Firstly, there are *subsistence home (intra)urban farmers* who farm around their homes or adjacent to their dwelling places. UA is usually utilized for home consumption rather than sale. A second strategy involves *family-type commercial farmers*, and these seem to be the predominant group. A common feature of these farmers is previous experience in both, the formal and informal employment sector followed by its failure. UA seems to be the optimal

[13] Urban agriculture depends on various circumstances such as land accessibility, water availability, and the resources brought into the agricultural process (Ellis, Sumberg, 1998). There is also geographical matter whereas topography and climate play role (Nugent, 2000).

way to earn monetary income to pay additional expenses (housing, schooling, health care, etc.). A third category describes *urban agricultural entrepreneurs* who are characterized by large-scale production and provision of salaried employment. They also often control the marketing of their produce. The last group are *multi-cropping peri-urban farmers.* In this category it is possible to find many characteristics of rural agriculture, but the farmers are limited by urbanization and hardly influenced by the city. All these categories are more closely described in Table 1.

Table 1: *Classification of urban agriculture according to socio-economic profiles*

	Home-subsistence farmers	**Family-type commercial farmers**	**Entrepreneurs**	**Multicropping peri-urban farmers**
Location	urban (peri-urban)	urban/peri-urban	peri-urban	peri-urban
Outlets	home	urban markets	urban markets + export	home + urban market
Objective	home consumption	income for subsistence	additional income leisure	home consumption and income for subsistence
Size	< 100 m^2	< 1 000 m^2	> 2 000 m^2	> 5 000 m^2
Products	leafy vegetables, cassava, plantain, maize, rice, goats and sheep, poultry, fruits	leafy vegetables, temperate vegetables, poultry	temperate vegetables, fruits, poultry, livestock, fish	staple food crops, local vegetable
Gender	Female	female + male	male	female + male
Limiting factor	Size	size, land security, access to inputs, water and services, marketing risks	technical expertise, marketing risk	access to inputs, soil fertility

Source: Moustier, Danso (2006)

Table 1 provides a comprehensive insight into urban agriculture socio-economic classification. It also clearly shows differences in particular strategies in terms of location, market orientation, the general purpose of farming as well as the size of a farmer's plots and production. It suggests there is a wide variety in the concept of UA and demonstrates why it is so difficult to measure its economic impact. It must be noted that it is hard to state which strategy predominates and where it can be found. Finally, range analysis is important for evaluation of the socio-economic impact of urban agriculture.

Urban agriculture has a variety of impacts on an economy. They range from a household to a regional level. Regarding the overall topic of the whole thesis, the author focuses mainly on the household and community level. Nevertheless, all dimensions intersect therefore it is quite hard to find an exact line among them.

Nugent (2000) demonstrates the significance of income earned by urban agriculture on different case studies across the developing world. It was found that in several African cities UA functions as a meaningful contributor to household maintenance, especially for vegetable growers. Earnings from farming represent a significant share of their total income. This depends on several factors: from those mentioned in Table 1. (location, size of land, market orientation and products) to more particular ones, such as availability and price of inputs, irrigation level during the dry season, technologies and market accessibility (Van Veenhuizen, Danso, 2007).

An important aspect of urban agriculture is the provision of a significant part of their diet by the farmers themselves. Thus, households engaged in UA are able to save part of their money which can be used for further investment. This additional income can be spent on more nutritionally valuable food, schooling for children and on health care (Mougeot, 2000). The welfare of single households depends on the scale of agricultural production, income level and on the way the money is invested.

Van Veenhuizen and Danso (2007) conclude that irrigated open-space vegetable production allows significant profits and despite of its informal character it is one of the most productive farming systems in Africa. Ornamental plant and flower production seems to be the most profitable branch of UA. On the other hand, small-scale subsistence agriculture is more important in terms of household maintenance. Keeping livestock is also significant, pigs and poultry farming in particular represent profitable ventures and guarantee high return of investments but they require higher start-up capital.

On a community level, urban agriculture can boost a local economy and contributes to formal and informal channels of food distribution in the neighbourhoods. In low income areas in Bissau (Guinea), Brazzaville (Congo) and Nairobi (Kenya) a positive impact has been observed on local communities. Urban farmers are linked with the food trade, they produce previously unaffordable food

products, provide food transfers and gifts as well as food sharing (Mougeot, 2000). Employment is another area where 80% of the urban population are working in the informal sector. It implies that the majority of urban dwellers are self-employed (FAO, 2012). Thus, urban agriculture contributes to overall employment. It provides jobs for the farmers themselves, it offers jobs for those who failed on the labour market and it makes up a secondary or seasonal income for those who are not able to cover their basic needs (Smit, Nasr, Ratta, 2001). Nugent (2002) argues that wage labour is little used in urban agriculture and it has a more seasonal character rather than regular.

Urban agriculture also stimulates economic activity. There are several incentives for related industries due to urban farmers, who need to obtain basic inputs as well as to ensure their access to the markets. Throughout agricultural production whole chain of associated agencies can be developed. They range from fertilizer processing (organic and artificial), agricultural technologies (e.g. irrigation technologies, sewing machines) to food treatment, package and sale (Moustier, 2001). In contrast, Nugent (2000) states that these activities are not as significant as other studies assert. Urban agriculture uses little inputs and most of them are available for free (e.g. land, water, labour) or for a low price. Consequently, the boost for the local market economy is low. Finally, if UA is not large-scale, highly market-oriented and widely practised, its injection function has failed.

On the other hand, urban agriculture brings at least some economic potential to areas which do not accommodate other activities. For instance, UA competes with other industries for space but it very often utilizes idle land which is not suitable for house construction[14] or other development (Bryld, 2003). Urban agriculture uses water surfaces, rooftops, floodplains, steep slopes and other spaces within and around cities. Moreover, urban waste recycling has hidden economic benefits in terms of processing and marketing (Smit, Nasr, Ratta, 2001). Conversely, organic waste marketing is closely related to a farmer's willingness to pay, and studies have shown that large-scale centralized composting is not economically viable (Cofie, Adam-Bradford, Drechsel, 2006). This finding again supports Nugent's

[14] Utilization of vacant land is further discussed in chapter 3.2.3. Urban Agriculture and the Environment

statement that urban agriculture has certain economic advantages but on the regional level it does not have a significant effect.

Although empirical research on economical impact of urban agriculture exists, it is tricky to apply the given data universally. Particular studies use different methodologies with different objectives, thus comparison across regions or even cities is impertinent (Nugent, 2000). Van Veenhuizen and Danso (2007) support data incompatibility by emphasizing the informal character of urban agriculture. Most of the products are sold at informal markets and it is hard to determine their price. Moreover, official statistics do not cover overall production. Another question concerns the fact that urban farming households are better-off than the norm. This presumption is supported by Lee-Smith (2010) who has tried to solve this riddle. Based on case studies from Kampala, Nakuru, Yaoundé, Dar es Salaam and Addis Ababa, she demonstrates that among farming households better-off families are proportionally over-represented. Regarding the extent of opportunities which can be undertaken by poor urban farmers, there are still many queries, but the answer remains unclear based on the available data.

Whether urban farmers are successful or not, greatly depends on the household capital. Prain and Lee-Smith (2010) distinguish five types of capital or assets which are needed for a household's livelihood development: natural capital[15], physical capital[16], human capital[17], financial capital[18] and social capital[19]. These assets determine the form of livelihood strategy implementation and what kind of livelihood outcomes households will achieve. Lack of each capital means significant impediment. In this section, the author mainly focuses on land tenure and the perception of urban agriculture by local governments, taking into consideration the fact that these attributes require certain attention on behalf of the policy makers.

One of the major obstacles for urban farmers is a lack of natural capital; land specifically. Only 20% of all urban agriculture takes place on land under the private

[15] Natural capital involves amount and quality of accessible land, water and biodiversity, ranging from formal land titles to informal and illegal utilization of public spaces.
[16] Physical capital includes all kinds of material inputs (buildings, equipment, domestic animals, transport, seeds and others) which are necessary for any agricultural production.
[17] Human capital is represented by manual labour, practical skills, knowledge, health and wellness.
[18] Financial capital is created by available income and savings and access to credit services (formal and informal).
[19] Social capital is made up by membership in formal and informal networks and groups which have supportive functions and involves different kinds of reciprocal services.

ownership. This implies that the majority of farmers use public or hired land for their cultivation (Bryld, 2003). Adequate land is crucial for any agricultural activity but many farmers utilize public open-spaces and private vacant land without the permission of the owner (Ruel, Haddad, Garret, 1999). Title deeds are rare as well as tenancy agreements, and if any exist contracts are mostly unsecured and overpriced because a proper legal framework is often missing (Bryld, 2003). Additionally, land ownership defines not only the legal or illegal status of urban agriculture, but also its formal or informal character. Access to the land and its possession is critical for the sustainability of the whole livelihood strategy (Van Veenhuizen, Danso, 2007).

Another issue is insecure yield. Many conditions that affect a farmer's production (water scarcity, land quaility, climatic effects, plant pests, etc.) are risks for both, rural and urban agriculture. Additionally, urban agriculture has to face one extra limiting factor. In many cities of the developing world, UA is an illegal or restricted activity. Particularly in Africa, there are several laws and by-laws pertaining to urban agriculture and its relation to other segments of urban life[20] (Mubvami, Mushamba, 2006). Consequently, cases of slashing crops have been reported across the whole continent. These attacks are usually initiated by city councils and they are quite often even in times of crisis. Farmers are also confronted with the very changeable minds of town clerks and the sporadic agenda on UA. In general, claims that agriculture does not belong to urban space prevail (Mbiba, 2000). Fortunately, this trend is declining recently and many efforts for a legal framework for UA exist and local governments have slowly started to include it into their policy plans (Mubvami, Mushamba, 2006).

Contentious land tenure as well as a negative perception of UA by local governments discourages farmers in terms of market behaviour, further investment in the land and environmentally-friendly behaviour (Ruel, Haddad, Garret, 1999). Many farmers implement risk-reduction strategies, therefore they grow vegetables with low yield and short-duration seasonal crops. This is a form of protection against crop slashing and occasional thefts (Bryld, 2003).

[20] For example, Town and Country Planning Act Cap 283 of the Law of Zambia restricts use of residential land, road reserve or recreational land for urban agriculture because it is in contradiction with physical development of the country. Also the Public Health Act Cap 295 of the Law of Zambia excludes urban agriculture from the residential areas. UA is perceived as a source of diseases (Mposha, 2005, cited in Mubvami, Mushamba 2006).

3.2.3. Urban Agriculture and the Environment

Most of the developing countries have poor urban planning. Rapid urbanization is closely associated with uncontrolled urban sprawl when cities absorb adjacent villages. Rural-urban migration is another problem which must be dealt with. Unfortunately, the establishment of shanty towns seems to be the common way to accommodate the poor population in the cities of the developing world. Areas of informal settlement have usually consumed all green spaces and the environmental damage is perceivable there as anywhere else. Additionally, poor urban dwellers are the most vulnerable to these unpleasant changes. Urban agriculture could be helpful as (spontaneous) a substitution for urban greenery and can alleviate consequences of environmental destruction. At the same time UA contributes to the sustainable development of cities.

Basically, a majority of cities in the developing world lack environmental policies regarding nutrient recycling, tree planting and so on (Bryld, 2003). Although urban agriculture is not the common tool for preserving the urban environment, it has several positive impacts.

Firstly, UA can significantly improve local climate. For example, air pollution is a serious issue in developing countries, especially in the emerging economies of Latin America and Asia where it is rising dramatically with the growth of industries and cities. Air problems have negative health and other effects (Smit, Nasr, Ratta, 2001). Trees and other green plants can absorb dust and gases through their foliage, they can increase humidity by water evaporation from their leaves and they can reduce radiation heating (Bryld, 2003; Deelstra, Girardet, 2000). Additionally, plants covering surfaces allow rainwater and runoff to soak into the land. Any green space helps protect cities against floods and landslides while hard-covered surface (e.g. streets, rooftops, parking place) maximize the risks of natural disaster (Deelstra, Girardet, 2000).

Within urban areas there is plenty of vacant land which cannot be used for commercial purposes, such as floodplains and steep slopes. Urban agriculture is a suitable activity which can be undertaken in these areas. Floodplains represent the opportunity to grow crops with a high need for irrigation (e.g. rice) while fruit-trees can be planted on steep slopes. This can be considered as a win-win situation where

vacant land gets some practical utilization beyond a mitigation function[21] (Smit, Nasr, Ratta, 2000).

Probably the most significant impact of urban agriculture on the environment is its ability to manage urban organic waste, an issue which is one of the major challenges for municipal authorities. The waste management sector remains under-financed and thus it is hard to ensure the presence of technical and institutional capacities for collecting, transporting and safely treating urban waste (Cofie, Adam-Bradford, Drechsel, 2006). The aim of efficient waste management should not just be to create dumping grounds and provide collection and transportation of garbage. Obviously the most effective solution is the waste reduction. Three different approaches are required at all levels of consumption: diminish amount of waste, re-use what can be re-used and recycle. Urban agriculture can be effective in all three approaches though the reduction of packaged food[22], during the production phase many items of household waste such as tires, carpets and clothing can be re-used. But the really pronounced activity connected to a reduction in the amount of waste is the recycling of organic waste (Deelstra, Girardet, 2000).

Composting is a popular way to recycle urban organic waste. It is done on different scales by different actors for different purposes. For example, large-scale municipality composting projects were implemented during the 1970s in the Western world but without proven success[23]. This example suggests that a better way of composting is decentralized and carried out as close to the resource as possible (Cofie, Adam-Bradford, Drechsel, 2006).

Urban agriculture, as with other agricultural systems, requires needed inputs such as fertilizers. It has already been mentioned that urban farmers very often lack basic capital, thus they are not able to purchase fertilizers. In this case, organic waste can be a low-cost and eco-friendly substitution for artificial soil conditioners. At the same time, UA represents a supply area for urban organic waste. Furedy (2002) concludes that current agricultural practice includes the utilization of organic waste.

[21] Plants grown on the riverbanks have a retention function, thus they are preventing floods. Terraced crops (trees and grasses) are the best option to use the steep slopes and to prevent soil erosion and landslides (Smit, Nasr, Ratta, 2001).
[22] Food is usually packaged if transported on longer distances.
[23] The collection and transportation of waste to the composting place is a time consuming and expensive process. Fossil fuel inputs extends economic inefficiency at the macro-level (Cofie, Adam-Bradford, Drechsel, 2006).

Firstly, we can find the direct application of decomposed solid waste which has been sorted out manually at disposal sites or on farms. Secondly, on-farm composting of urban animal and agricultural wastes is common. Finally, agricultural cultivation directly on dumpsites is not unusual. Thereby, Furedy's statement supports the Cofie, Adam-Bradford and Drechsel (2006) argument against centralized composting.

Urban agriculture can also indirectly improve urban water management. With the growth of an urban population there is also an increase in water consumption. Competition for fresh water resources among households, industry, institutions (e.g. hospitals) and agriculture is more intense (Buechler, Mekala, Keraita, 2006). In semi-arid and arid areas access to fresh water is limited, even for households. Water for irrigation is less available. Thus waste-water is often use for urban and peri-urban agriculture (Smit, Nasr, 1992).

Van der Hoek et al. (2004) created a typology classifying waste-water use into three categories. Firstly, urban waste-water can be applied directly to the land from a sewage system without any treatment; secondly, waste-water is treated and then channelled to a particular area for direct irrigation; thirdly, the indirect use of waste-water which is taken from other receiving water bodies (ponds, rivers, canals etc.). Conventional treatment is very expensive and in many developing countries most of the waste-water is dumped untreated – into the water bodies or onto the land (Buechler, Mekala, Keraita, 2006). It means that most farmers, especially the poor, use untreated waste-water both, directly and indirectly.

The use of waste-water for urban agriculture is beneficial in two major ways. At first, waste-water can substitute for fresh water and thus make it more available for drinking, cooking and other purposes. Waste-water is also rich in nutrients and provides precious agricultural inputs (Smit, Nasr, 1992). Alternatively, recent sewage systems of the developing world combine waste-water with several pollutants which are dangerous to health[24]. Waste-water re-use demands investment in treatment processes and plants, and also improved organizational capacity (Deelstra, Girardet, 2000).

[24] Risks connected to use of waste-water are discussed in chapter 3.2.1. Food Security and Health

Definitely, the recycling of urban organic waste and the re-use of waste-water (treated and untreated) are relevant resources for agriculture and help sustainable urban growth. But today's cities are confronted with another environmental issue which is less obvious than the management of urban waste or waste-water, and it is called nutrient recycling.

Waste in the cities is often seen as something useless without any benefit to modern society. Municipalities usually imagine cities as a place where there is no waste and everything is transported out of the urban area. Another approach to waste exists. It must be seen as an important element in sustainable urbanization. Local governments operate *open loop* systems with *"one-way flows of resources (in) and wastes (out)",* while the ideal solution is a *closed loop* system where *"the definition of wastes and resources becomes blurred"* (Smit, Nasr, 1992:143). A typical example of linear urban *metabolism* is a sewage system which is usually discharged (treated or not treated) into rivers and coastal areas. Coastal waters are heavily polluted while cities lose their nutrients. Human waste is not the only pollutant, artificial fertilizers and chemicals also appear in the sea. Paradoxically, waste-water contains necessary nutrients which are then replaced by agrochemicals, and not only in the cities (Deelstra, Girardet, 2000). Urban agriculture is a clear example of the possibility of converting the linear system into one based on the consume-process-reuse closed loop (Smit, Nasr, 1992).

Even though urban agriculture represents a way forward for sustainable cities, several environmental issues must be considered. First sight suggests its eco-friendliness but the recycling of organic wastes and the use of organic fertilizers is not so common. Of course, evidence of best practice exists in Cuba, where almost everything is grown without additional agrochemicals. There is a law which prohibits the use of artificial fertilizers within the limits of Havana (Altieri et al, 1999). Unfortunately, the reality in other world cities looks different, and organic UA is only sporadically carried out[25].

Fertilizers, pesticides and others agrochemicals are exactly the issue which usually is used against UA. Obviously, they can cause serious environmental

[25] There is no general pattern of urban agriculture and organic fertilizer use but within one city can be found highly fertilizer intensive agriculture and organic production at the same moment.

damage. Land contamination in the place of direct application can be spread due to rain or groundwater (Brown, Jameton, 2000). In general, the utilization of agrochemicals is typical for market-oriented urban agriculture, respectively cash crops. Poor subsistence farmers cannot afford to purchase expensive fertilizers and replace them by organic inputs (Van Veehnuizen, Danso, 2007). The utilization of agrochemicals is sometimes uncontrolled where (mainly poor) farmers do not have sufficient knowledge of their application. Those farmers are also more vulnerable to the health impacts from inappropriate use as well as to land contamination (Smit, Nasr, Ratta, 2001).

Bryld (2003) concludes that every single agricultural activity is unsustainable in the long term if farmers do not have environmental awareness. Monoculture leads to soil erosion and high level irrigation causes nutrient depletion (Van Veenhuizen, Danso, 2007). Urban agriculture can also be harmful to biodiversity if rich ecosystems are modified into farmlands (Smit, Nasr, Ratta, 2001).

3.2.4. Conclusion

Table 2 briefly depicts the most significant benefits of urban agriculture which have been discussed in detail in the previous section. Urban agriculture definitely contributes to several indicators of urban well-being. It can improve the availability of food for urban poor by direct provision of vegetable and other nutrition by farmers. It also reduces the price of food by direct marketing without the need for packaging and long term storage. Selling surplus or market oriented production increases household income. Certain socio-economic benefits exist. They are significant mostly on a household and community level. The impact on the overall economy of a city is unclear and disputable, but it contributes to the diversity of food production and thus provides at least some stability. Finally, urban agriculture has a positive environmental effect if correctly practised. Hydrological functions as well as improvements in air and soil quality have been proved.

Of course, many negative aspects are present. They are mostly connected to health risks, such as disease transmission. Although UA has many positive effects on the environment, it can also contribute to the degradation of land through

inappropriate practices. Most of these problems related to UA can be solved by proper policy planning.

The lack of policy attention also causes uncertainty among farmers. They have to challenge insecure land tenures and often depreciation on the side of city councils. In the future there are many challenges which must be handled. Further research and better understanding of the whole concept are needed for the undertaking of policy action.

Table 2: *Benefits of urban agriculture*

Agricultural production	**Indirect economic benefits**
marketed	multiplier effects
non-marketed	recreational
	economic diversity and stability
Social and psychological benefits	**Ecological benefits**
food security (available and affordable)	hydrologic function
dietary diversity	air quality
personal psychological benefits	soil quality
community cohesion and well-being	

Source: Nugent (1999)

4. COMMUNITY-BASED URBAN AGRICULTURE

Recently, development assistance is increasingly using the concept of *community-based development* since the communities are usually seen as the impetus for the development (Mansuri, Rao, 2004). This process has two major goals: to improve the well-being of all community members and to involve all members in this process (Nikkah, Reduzan, 2009). Other goals of community development are: poverty alleviation, empowerment, raising of social capital, sustainability and so on (Mansuri, Rao, 2004). Nikkah and Reduzan (2009) also recognize two major approaches: *bottom-up* and *top-down*. Bottom-up means that the community itself stimulates activities while top-down is more often led by outside institutions such as government and development agencies.

Bottom-up and top-down approaches to the communities are integrated within the concept of urban agriculture. We can find community gardens aimed at disadvantaged groups (HIV/AIDS positive, disabled children, orphans, prisoners) as well as cooperatives and informal groups of farmers. Both types are targeted by *community-based development* projects and programmes.

Questions about the sustainability of the concept of the community gardens have arisen. The author's hypothesis is that urban community gardens which involve disadvantaged groups are more likely to represent the top-down approach. These communities are not usually familiar with the farming which represents just another form of empowerment. These circumstances make this concept more unsustainable in terms of the continuation of the project, considering the fact that after the end of donations and control from the second side, these top-down communities may disappear.

On the other hand, non-formal groups of farmers and urban agricultural cooperatives are seen by the author as the more sustainable form of community-based urban agriculture. These groups are very often small-scale but market-oriented and thus they are able to fund their activities and they do not depend greatly on the development aid. Usually, this concept is not implemented from outside. Projects aimed at these communities are predominantly focused on capacity building (e.g. better farming practices) and the development of the group members' knowledge and abilities.

Nevertheless, the author does not underestimate either of these concepts as it is assumed that every collective action has a wider impact than the action of single person. Moreover, communities (no matter if they are established artificially or not) can become very powerful players if well organized. Additionally, each type of community-based urban agriculture has a specific impact on community members which differs from case to case.

Finally, community-based urban agriculture is a form of institution, and community gardens which are usually supported by public bodies, NGOs and private foundations. Supporting community projects seems to be more sustainable than supporting individuals (de Neergaard, Drescher, Kouamé, 2009) and community gardens are even promoted by governments, such as Mozambique and Cuba (Smit, Nasr, Ratta, 2001).

In this section, the author focuses on all forms of community-based urban agriculture and links them with the benefits and threats described above in chapter 3.2. Benefits and Threats of Urban Agriculture. Afterwards, a case study of the Zambian city Ndola will introduce the results of qualitative research conducted by the author in the summer of 2013.

4.1. Defining Communities within the Context of Urban Agriculture

The term *community* is becoming increasingly popular among scientists, development agencies, NGOs and the public. It is possible to recognize many different types of communities, but those who undertake so called *community-based development* usually do not distinguish between them properly.

Basically, three types of communities can be distinguished: *communities of place*[26], *communities of interests*[27] and *communities of circumstances*[28]. All three types can overlap and members of each community can recognize what is common for all of them, but they do not separate themselves from the rest of urban society (Smit, Bailkey, 2006). It must be noted, that it is not exceptional to be a member

[26] Community of place can refer to cities, villages, neighbourhoods and refugee camps for instance.
[27] Community of interests reflects something in common for all the members such as belief, cultural background, job, education, etc.
[28] Community of circumstances refers to race and ethnicity, disabilities, prisons, orphanages, and so on.

of more than one community. For example, one can be a member of community of interest (farmers) and at the same time this person is clearly a member of community of place (neighbourhood). Mansuri and Rao (2004) point out a very serious problem: that communities are actually very often endogenous constructs rather than the organic forms. Such artificial communities are usually defined by outside actors and do not correspond with local power structures. This fact reflects the *top-down* approach to communities and their development.

Community-based urban agriculture can be represented by all the above types of communities but it sometimes leads to the misunderstanding that actually all urban agriculture activities are community-based. Conversely, community gardens are the second most common site for practising urban agriculture (Smit, Nasr, Ratta, 2001). Moreover, many forms of urban agriculture embody at least some social organisation which strengthens urban communities and enhances community capital (Smit, Bailkey, 2006).

Community gardens (community-based urban agriculture) are usually characterized by shared access to the water resources and the common land tenure (de Neergaard, Drescher, Kouamé, 2009). Each member usually maintains his/her own plot but shares responsibility for particular elements of the community such as water supply, security, pathways, fences, etc. (Smit, Nasr, Ratta, 2001). Communities have higher potential to ensure secure leasehold than individuals (de Neergaard, Drescher, Kouamé, 2009) thus the institutionalization of urban agriculture brings several advantages.

The available literature referring to community-based urban agricultural activities suggests that this activity is widely practised in the countries of the global North while in the developing countries it is less common. Therefore, very little literature and research covers this issue in the global South.

4.2. Disadvantaged Communities and Urban Agriculture

Urban dwellers are very often disadvantaged in African countries. This drawback can be caused through many factors such as poverty and related problems, but some of them are more stigmatizing than others. For example, orphans, people with physical and mental disabilities and people who are HIV/AIDS positive are among the most vulnerable groups. Community centres aimed at these socially excluded groups have been established all around the developing world recently. Urban gardening has become a popular way to enhance the lives of disadvantaged communities. Although this approach is more likely top-down than bottom-up, it plays a significant role in society and it can change the lives of these people.

In this section the author focuses on communities where urban agriculture is implemented rather than authentic. The literature usually refers to *community gardens* but this concept still has much common with community-based urban agriculture. There is only a little literature and research available concerning community gardens in the developing world, especially in Africa. It has been proven by Guitart, Pickering and Byrne (2012) through their exploration of available original research on community gardens. They suggest that only two research studies were undertaken in Africa. Nevertheless, it must be emphasized that their paper included only English language journals thus the scale of published research results and case studies may be broader if other languages are considered.

This part of the thesis is mainly based on case studies published in UA Magazine supervised by the RUAF Foundation. These papers are very site specific and they offer different cases of community gardens and community-based urban agriculture. Unfortunately, the case studies from UA Magazines are dated 2006 and 2009 and many changes could have happened. It is also very rare to find current reports describing named community projects. Firstly, the overview of different projects and efforts in CBUA will be introduced. The following section will pay attention to the effects and impacts of such programmes on the community members.

Recently, urban agriculture projects encompassing communities are becoming increasingly popular. HIV/AIDS communities in particular are targeted by these projects. Households where at least one person suffers from this illness are usually forced to change their diet and the food security mechanism is affected.

Those who are sick are not able to work to generate income to purchase food (Wills, Chinemana, Rudolph 2009). HIV/AIDS positive people also require a higher protein intake and a sufficient amount of vitamins and minerals to cope with and slow down the progress of the infection. Unfortunately, most urban poor households are unable to satisfy the nutritional needs of the sick members (Mubvami, Manyati, 2007). Such projects are important specifically in southern Africa as the prevalence of HIV/AIDS is the highest in the world.

The Ubuntu Foundation in Port Elisabeth (South Africa) started with the food gardening project in a local health clinic in 2005. The food garden was established and intensive training was carried out. This project brings together the local community and patients of the clinic who are supported by the community members. The garden provides economic and nutritional support to individuals on antiretroviral therapy. Almost 60% of the yield is consumed by the patients while the rest is sold or consumed by the gardeners (Lief, 2007).

The Ubuntu's gardening project is a typical example of community-based urban agriculture as defined by Smit and Bailkey (2006). According to them, CBUA is a shared activity aiming to build and strengthen the community while producing fresh food and other agricultural products. The Ubuntu's health clinic garden brings together locals from the neighbourhood and supports HIV/AIDS infected people at the same time, thus the project provides social interaction and cohesion. Definitely, every project has certain limitations and the main problem of a clinic garden is the additional stigmatization of people living with HIV/AIDS. When the community members started to work together with some members of the supported group, the issue was clarified after several meetings and it has even led to deeper social cohesion (Lief, 2007). Mubvami and Manyati (2007) confirm that the inclusion of people affected by HIV/AIDS in the gardening projects is crucial for the stigma removal. They also demonstrate that community gardens where infected people can work alongside the rest of the community are suitable learning grounds for issues related to HIV/AIDS. These community projects can also provide an occupation for the high-risk groups thus they lower their vulnerability.

Projects promoting community-based urban agriculture can also reach the physically and mentally disabled. Evidence from Kampala School for the Physically

Handicapped, which is home to 100 children, shows that even people with disabilities can be involved in the urban agriculture. The pupils range in age from 6 to 24 years and they participate in the agricultural activities according to their abilities. The school maintains a productive garden where food for the children's needs is cultivated. This project brings the innovative idea that disabled children can grow their own food and they can use the acquired knowledge in the future. Teachers cooperate with the pupils and they all provide the food needed for the school's nutrition programme (Rutt, 2007).

Another example of community-based urban agriculture is the so called *garden in a sack* or *farming in bags.* The implementation of such projects is a response to land scarcity in the urban areas. For instance, the French NGO Solidarités supports the communities in Kibera, the biggest slum in Nairobi (Kenya). One of its activities is also the *garden in a sack* project. Most of the land in the slum is dedicated to housing, thus little land can be used for agriculture. Sacks are filled with soil and they supplement scarce agricultural land. In 2007, 11,000 households were engaged in the project. Household members have adopted the technique and they have started to cultivate vegetables on their doorsteps. Individual members of community donate some part of their land for use by the Solidarités and the nursery beds were established. Seeds and the guidance have been provided by Solidarités while community members managed the nurseries (Pascal, Mwende, 2009).

A similar project has been implemented in refugee camps in northern Uganda. Refugee camps are perceived as temporary settlements and people who live there are seen as passive recipients of aid. Refugees are not usually allowed to work outside the camp and they are totally dependent on the food transfers. On the other hand, many dynamics and processes remain hidden in the camps. There are still some resources which can be found within the camps, such as primary and secondary schools, medical centres, shops and others. Thus an informal economy has evolved and today's refugee camps with thousands of inhabitants have become separate urban environments (Jansen, 2009). The micro-gardening project in Opit and Amuru camps in northern Uganda aims to improve the livelihood and food security for local households. Demonstration gardens where training is carried out are located in both camps. Community members are taught about the construction of a farming bag,

its maintenance and the vegetable harvesting. Each household is supported by one sack, seeds and an instruction sheet (Radice, Velly, 2009).

Among others, gardens adjacent to schools, orphanages and community centres are very common. They are usually established with the purpose of obtaining part of the pupil's diet. Children learn about agricultural practices, they become aware of what they eat and the knowledge gained can be utilized in their future lives. Especially in Africa, some schools are even able to earn additional income by selling their products, and thus they are supporting themselves and lowering their dependency on external donations (Smit, Nasr, Ratta, 2001).

Recently, it is possible to find many projects similar to those described above. The problem actually is that the literature offers particular case studies describing the success of the projects but the deeper exploration and research are very often missing. Still, based on available case studies it is possible to draw conclusions concerning top-down approach to community-based urban agriculture. Although these projects are aimed a different excluded communities, they still have many common fetatures.

The first and the most obvious point is that all projects are enhancing the quality of life in disadvantaged and vulnerable communities. The main objective is usually food security and nutrition obtained through subsistence agricultural production. Schools, people living with HIV/AIDS, orphans, the disabled – they all often rely on aid, transfers and gifts. Urban agriculture, community gardens in particular, can help them to maintain their livelihoods and simultaneously lower their dependency on external donations. Although most of these projects are run under the coordination of NGOs, churches, governments and other institutions, community-based urban agriculture creates funds where the members contribute through their farming efforts and thus the ownership of the whole project is distributed across all participants and stakeholders.

Moreover, community gardens also provide additional income for the farmers. The amount of money earned and its use varies according to the community and project. Still, participants are provided with the knowledge about farming and they are able to use the skills gained in the future. Human capital is developed and the probability of the community members' social inclusion rises. Institutions running

these programmes very often emphasize the empowerment of vulnerable groups and sub-groups.

Thirdly, some projects also involve people from the surrounding neighbourhoods so they are connecting disadvantaged groups with communities of place. These links have hidden potential in terms of hidden educational activity. Locals can learn about the difficulties and constrains of HIV/AIDS positive people, the disabled and orphans by working alongside them.

Finally, Smit and Bailkey (2006) conclude, that community-based urban agriculture builds and strengthens community capital. They distinguish seven dimensions of community capital found within CBUA.

Table 3: *Community capital enhanced through community-based urban agriculture*

Human capital	health, education, individual skills
Social capital	strength of groups, networking, common vision of members, connection across different communities
Political capital	group organisation and leadership dynamics, relations with government and supporting institutions
Cultural capital	values and heritage of the community and their celebration
Economic capital	investments, savings, contracts and grants
Built capital	land, housing, buildings and other physical settings
Natural capital	local air, water, biodiversity and scenery

Source: Smit, Bailkey (2006)

The assets named in Table 3 are necessary for the future progress of a community. *Human capital* is developed at the educational and health level. Also skills and knowledge are developed. For instance, school gardens represent a sort of educational preparatory. School children gain a practical knowledge of agriculture as well as becoming aware of discipline, organisation and responsibility. *Social capital* is important for communities where social cohesion is weak. Throughout community farming, group organisation and leadership are introduced. The most significant is social interaction itself and the sense of community ownership. *Political capital* can be split into two dimensions. Firstly, political capital can be measured through internal organisation and decision making (democratic, authoritative or a combination of the two). The second way of measurement is represented

by the relationship among community and local government structures. Such relations are vital for further community development. Cultural events celebrating the values and heritage of a community are depicting the *cultural capital.* The significance of cultural capital rises with the weakening of community self-determination thus it is more characteristic of places where minorities and traditions are oppressed[29]. *Economic capital* is deeply dependent on human and social capital but it is an engine for the overall development of a community. Moreover, if a community has shared financial assets it can be followed by the establishment of viable entrepreneurship. As economic capital is determined by human and social assets, *built capital* is subject to these three. It is often overlooked but CBUA utilize such urban areas which are not suitable for other economic activity. Secondly, built capital includes not only the infrastructure needed for agriculture but housing for the farmers is also involved. Finally, *natural capital* is developed through the engagement of new, more eco-friendly practices and techniques. For instance, the implementation of agroforestry and permaculture can improve the local environment and thus the overall well-being of the community members (Smit, Bailkey, 2006).

Certain negative aspects of community-based urban agriculture occur. The most pronounced one is the additional stigmatization of disadvantaged communities such as HIV/AIDS infected people. The danger is incidental if these groups are not directly involved in the projects, particularly if the community supports the excluded groups without their participation. Ownership of the project has to be split between both groups and cooperation is crucial for the sustainability and positive social implications of these programmes.

[29] Cultural events are very common in western countries but they can also occur in the developing world.

4.3. Cooperatives and Non-formal Groups of Urban Farmers

Urban agriculture is one possible survival strategy for the urban poor. It usually emerges in times of crisis and it is a response to the worsening well-being of the urban poor. Disadvantaged and excluded groups usually see urban agriculture as an already implemented concept, while small-scale subsistence farmers chose UA when they were looking for employment opportunities.

This part of the thesis will focus on groups and communities which emerge naturally. The formation of community does not have to be the matter of governments, NGOs and other agencies. There are also grassroots movements that reflect the needs of local people. These initiatives are very often supported from external sites but the first impulse originates from the farmers. If some projects are implemented, they are usually aimed at improving farmers' skills, abilities and knowledge.

The case study of Chipulukusu Vegetable Growers Cooperative in Ndola, Zambia will be introduced. The study is perceived as a representative example of bottom-up approach to community-based urban agriculture. For lucidity, the case study from Ndola will begin a new chapter.

5. CASE STUDY: CHIPULUKUSU VEGETABLE GROWERS SOCIETY, NDOLA, ZAMBIA

The case study of Ndola gives an overview of the lives of urban farmers who have chosen agriculture as their survival strategy. Many of them have been farming for several years or even decades, while some farmers have only recently decided to start with agriculture.

The first part of the study will introduce research methodology and the site of the case. The second section will discuss the results of the research. The third part will conclude the results of the research and make a final statement.

5.1. Research Methodology

The case study covering the farmers of Chipulukusu, the biggest (32,066 inhabitants) and oldest township in Ndola, Zambia, is based on field research conducted by the author in the summer 2013 in partnership with the RUAF Foundation, Copperbelt University and the Ministry of Agriculture and Cooperatives, Ndola district.

5.1.1. Aim and Specific Objectives

The farmers of Chipulukusu were targeted by the RUAF Foundation's three years From Seed to Table (FSTT) project in years 2009 – 2011. The aim of the research was to explore the impact of the project on the farmer's well-being and the main research question was *How did the From Seed to Table project influence the Chipulukusu farmers' community?* Nevertheless, specific objectives describing and analysing more particular questions have been designed. The specific objectives are listed in Table 4.

The aims and specific objectives have been chosen upon the literature and the observation of the research site. It must be emphasized that before arriving in Ndola, the author's vision of the research was slightly out of focus because the available literature usually refers to different types of community-based urban

agriculture. The prior assumption was based on the model of a community garden as described in chapter 4.2 but in reality the place was much different. Thus, most of the research was designed in the place after the area of Chipulukusu had been observed.

Table 4: *Specific objectives and used methods*

	Specific Objective	**Methods used**
1.	To identify the farmers of Chipulukusu	Observation, interview
2.	To explore the motivations of the farmers to start with agriculture	Interview
3.	To summarize the average weekly income which is earned through urban agriculture	Interview
4.	To analyse the relationship between FSTT and the local community	Interview, focus group
5.	To determine the aspects and perceptions of the community and the cooperative	Interview, focus group
6.	To determine the causes and impacts of the cooperative failure	Focus group

5.1.2. Primary Data Collection and Methods Used

Primary data were collected over the 2 months which I spent in Ndola. My stay was arranged with the help of the RUAF Foundation, MDP-ESA and Copperbelt University. During the preliminary phase I contacted the RUAF Foundation to ask them for mediation of my arrival in Ndola. Then I was linked to MDP-ESA, which is RUAF's partner for this region of southern Africa. MDP-ESA is based in Harare, Zimbabwe and I was put in touch with prof. Jacob Mwitwa from Copperbelt University in Kitwe (Zambia). He was the local coordinator of the FSTT project. Finally, officers of the Ministry of Agriculture and Cooperatives in Ndola became my principal gatekeepers, considering the fact that Kitwe was about 60 km away.

Different methods of qualitative research were utilized during the research. As a very helpful guide for the research design and the decoding of the data which

followed the publication *Qualitative Research Practice: A Guide for Social Science Students and Researchers* (Ritchie, Lewis, 2003) was used.

Observation was a critical source of information needed for the formulation of interviews and it also had a complementary function to other methods. The initial stage of the research was focused on the author's interaction with the MACO officers and the farmers. It took 10 days during which plenty of informal talks were carried out and these served as the basis for the next research design.

Within this period several obstacles were found. Despite the fact that I was introduced to the MACO officer who was responsible for the FSTT project, and the collaboration was agreed, cooperation was difficult in terms of time keeping and information communication. Therefore, after the first meeting with farmers all arrangements were made independently and MACO started to hold the position of gatekeeper rather than key informant. The position of key informant was spontaneously occupied by Davies M. who presented himself as a leader of the community. His personality played a significant role in the whole research as will be shown later. However, observation was very important in the initial phase and its significance rose in the time I spent with the farmers of Chipulukusu. Later, others key informants were found and the distortion of reality as given by Davies M. was discovered.

Semi-structured interviews with the farmers are the core resource of the research. After the observation phase the interview structure was completed. Only open-ended questions were asked and respondents had the opportunity to extend their answers to areas which were not included into the structure. If any doubts and misunderstanding happened, supplementary questions were asked to clarify the conclusion. Within the period of one month 18 semi-structured interviews were undertaken, of whom 11 respondents were men and 7 respondents were women. Five interviews were conducted in English, while the rest were in Bemba[30] with translations provided by Davies M. All interviews were recorded by digital device under the oral consent of the interviewees. Respondents were familiarized with the purpose and aims of the research. The names and the language of the interview are listed in Table 5.

[30] Two interviews were partly in English and partly in Bemba.

If the information gained from the interviews is used, the name of the respondent is noted in the bibliography.

Expertise interviews were limited by the unwillingness of the representatives of the supportive institutions and by a lack of time. Therefore, only one in-depth expertise interview was carried out. Three other interview requests failed after I was asked to send the questions by email. I did not receive replies, even though the respondents were claimed they did reply.

Finally, after the exploration of the internal problems of the group, four *focus group* sessions took place. While semi-structured interviews were focused on the overall situation of the farmers, their motivation and perception of community and cooperative, the focus group questions aimed in particular to discover the causes of the failure of the cooperative. The decision to carry out these group discussions was made after others key informants Bennard Ch. and Demar M. came up with information describing the troubles within the community. Focus groups were undertaken within a period of 8 days and four groups were called for the discussion. Each group comprised of between ten and twenty people and everyone had the opportunity to give his opinion.

Given data were decoded, analysed and triangulated. Links to the personal interviews are clarified in the text to avoid misleading interpretations. All interviewees are indicated by their first name and the initial letter of the surname to ensure their privacy.

Table 5: *List of Interviewees*

No.	Name	Language	No.	Name	Language
1.	Davies M.	English	10.	Elizabeth M.	Bemba
2.	Benard Ch.	English	11.	Emeldah L.	Bemba, English
3.	Francis Ch.	Bemba, English	12.	Evelyne B.	Bemba
4.	Davison L.	Bemba	13.	Albetina Ch.	Bemba
5.	Piyhson T.	Bemba	14.	John N.	Bemba
6.	Christopher M.	Bemba	15.	Promise K.	Bemba
7.	Demar M.	English	16.	Osia Ch.	Bemba
8.	James N.	English	17.	Mary Ch.	Bemba
9.	Esnart M.	Bemba	18.	Phillip M.	Bemba

5.1.3. Secondary Data Analysis

Secondary data were utilized with the purpose of complementing the data obtained through the research. MDP-ESA in partnership with the RUAF Foundation has issued several studies describing the situation of urban agriculture in Ndola. The three studies, *Farming System Analysis of Ndola Urban and Peri-Urban Agriculture, Applied Study on Local Finance for Poor Urban and Peri-Urban Producers* and *Summary of Key Issues and Recommendations on Urban Agriculture*, were the major resources of background information.

Throughout multi-stakeholder policy action planning (MPAP) the *Urban Agriculture Strategic Agenda* and *Urban and Peri-Urban Agriculture Policy* were released in 2008. These two documents were very helpful when stakeholder analysis was needed. They were also used at the point when clarification of the facts concerning the legal framework of urban agriculture was needed. All documents published by MDP-ESA and the RUAF Foundation were crucial for the research design and they were supplementary to the observation process.

Another valuable source of information was the From Seed to Table project documentation. Documents regarding urban agriculture in Ndola (project documentation, urban agriculture analysis and others) have been kindly provided by prof. Jacob Mwitwa.

5.1.4. Limitation of the Case Study

The case study has several limitations which are caused by different aspects and concerns. The first bias could be generated by the translation of the interviews and the constant presence of Davies M. It might happen that respondents did not answer freely or the interpreter could change the meaning of their answers (purposely or accidentally). Consequently, the language barrier could cause misunderstanding of both, questions and answers.

An additional and probably very relevant impediment originates from the chosen sample. At the beginning I was introduced to the group of farmers led by Davies M. He became my key informant and he did not tell me about the existence of a second

group of farmers. This error occurred because of the author's total dependence on information from Davies M., while Benard Ch., the second leader of the project group, was not present at that time. When the interview with Demar M. and Benard M. (former secretary of the project) was conducted information about relevant problems in the community, was discovered. Thus, after more than 40 days of research, I found out accidentally that the community of farmers who participated in the From Seed to Table project had split into two competitive groups. Consequently, I accomplished interviews only with the member of the first group and I did not have enough time to continue with the research into the second group.

These circumstances also brought a new dimension to the specific objectives. Due to the surprising situation a new element of the case study was inserted and also a new qualitative research method was utilized. Anyway, prior knowledge of the overall situation could lead to the verification of data. The ideal scenario might be as follows: interviews conducted in group one (Davies M.) could be complemented and verified by questionnaires in the second group (Benard Ch.).

A third limitation was caused by an insufficient exploration of the position regarding urban agriculture of the representatives of the Ndola City Council and other experts engaging in urban agriculture who are not full time farmers but who are the policy makers, planners and agricultural experts.

Finally, the data gained through the field research cannot be applied universally. Several reasons exist. Firstly, urban agriculture is different in every single country or city and it is influenced by different circumstances and conditions. Secondly, the surveyed group is very specific in terms of its natural formation and the following intervention which has dislocated the community structures. Thirdly, the study is based on qualitative data only and that makes the results incomparable with other explorations.

5.1.5. Justification of Study

This study is significant especially in terms of its topic. Up to now, only a limited amount of research targeting community-based urban agriculture in Southern Africa exists. Literature on CBUA particularly targets South Africa (see Karaan and Mohamed, 1998; Lief, 2007; Oelofse, Auerbach and de Neergaard, 2007) and Zimbabwe (e.g. Mubvami and Maniaty, 2007) but Zambian urban agriculture lacks attention, despite the fact that the country belongs to LDCs (United Nations, 2014) and urban agriculture is practised almost everywhere. Moreover, if any case study exists, it more likely explores the top-down communities (see chapter 4.2. Disadvantaged Communities and Urban Agriculture).

Thus, the research is innovative because it considers the bottom-up driven development of a farmers' community. It shows evidence that informal groups of farmers have the potential to be developed into the formal and legal structure of a cooperative. The intervention from the external agencies is questionable as the research shows that the implementation of the cooperative vision has failed.

5.2. Research Site

Ndola is the third largest city in Zambia and the administrative capital of Copperbelt province. Copperbelt is well known for its copper production and despite the drop in the economy by the end of the 1990s, when local mines were losing millions of dollars each month (The Economist, 2001), the province is still a production centre for the whole country.

Traditionally, Copperbelt province has been the urban centre of the country. The urbanization process was induced by the boom of the mining industry and the site of urban settlements emerged at the beginning of the 20th century. Even after decolonization, the government kept investing in the infrastructure and the development of the mining industry in the province (Potts, 2005). Today, Ndola is the commercial centre of Zambia. Manufacturing companies support mining industry which is spread all around the Copperbelt (Kalemba, 2013). However, poverty rates are very high and the economic growth in Zambia has not shown significant results in poverty

reduction. Major obstacles are population growth and the dependence on copper (World Bank, 2014).

Additionally, Copperbelt was hit by the economic crisis caused by the liberalization of the economy which also included the privatization of the mining industry. These circumstances led to the economic decline at the end of the 1990s and to the closure of many companies in the region around Ndola especially. Employment rates have fallen and poverty levels increased. Thus locals started to seek new working opportunities to sustain their lives. At that time, urban agriculture emerged as a vital survival strategy for those who had failed on the labour market and were not able to find a job (Phiri, 2009).

Recently, Ndola's overall population is 455,194 indicating that 23.2% of Copperbelt's inhabitants live in the city (CSO, 2011). Kalemba (2013) states, that 14.5% of Ndola's population lives in the slums. The proportion of people living in low-income areas who are unemployed is 71.7%. Moreover, only 11.1% of slum dwellers work in the formal sector[31] while the rest are employed in the informal sector[32].

Chipulukusu is the oldest and largest low-income area in Ndola with a total population of 32,066. This township can be defined as an unplanned settlement because the basic facilities (drainage system, pipe water, electricity, paved roads etc.) are missing and many houses are built from the mud (Kalemba, 2013).

The majority of Chipulukusu's inhabitants are unemployed or working in the informal sector where the selling of the smallware is the most popular activity (Kalemba, 2013). Nevertheless the forms of livelihood strategies can be different. For instance, Chipulukusu lies close to a lime factory therefore some people exploit old mining pits to extract the deposits left after the mining. Others depend on natural resources such as charcoal[33] production and wood collection (Davies M., Benard Ch.). Furthermore, over 500 people survive with the help of urban agriculture. The number of urban farmers is highest in the city (Phiri, 2009).

[31] Those people are usually employed as unskilled or semi-skilled workers.
[32] People looking for some income generating activities in the informal sector usually run stalls on the roadside or they are street vendors.
[33] Popular term for charcoal is *chaco* in Zambia.

5.3. Urban Agriculture in Ndola

Urban agriculture can be found almost everywhere in Ndola and activities such as maize cultivation have been practised in the city for a long time. It is impossible to generalize the typical urban farmer in Ndola as the population engaged in urban agriculture are spread across the income spectrum. Thus, people from different socio-economical backgrounds can be characterized as urban farmers. Also the purpose of farming varies. Urban dwellers farm with the need of maintenance of their lives as well as for economic profit. Eventually, leisure farmers can be found. Moreover, schools, colleges, prisons and other institutions such as Ndola City Council run their own food gardens (MDP-ESA, RUAF Foundation, 2008).

Henry M. (2013) drew the general conclusion that backyard gardening for home consumption is found within middle-income and high-income areas, and the cultivation of open space is typical for low-income areas. Some residents of high and low income areas also own small plots outside the city in peri-urban areas (MDP-ESA, RUAF Foundation, 2008). The purpose of subsistence predominates among gardeners, while farmers who squat open spaces are more involved in market production. Respectively, almost all farmers are engaged in agriculture in order to ensure a basic food intake, but many of them also sell the surplus (Henry M., 2013).

Farmers in Ndola are engaged in vegetable and livestock production but the cropping systems predominate. While livestock keeping is very rare, chicken rearing is quite popular (Henry M., 2013). It is typical for middle-income and high-income areas rather than low-income townships. This distribution is based upon the assumption that poultry production requires sufficient space and high capital inputs (pasture, construction of poultry-house, medication, etc.). Residents of low-income areas lack capital and space, thus they chose such farming systems which do not depend upon them (Mwitwa, 2008).

Gender is almost equally distributed between both sexes; 61% are women and 39% are men. More than one third of women farmers are single and they support five household members on average. The farmers of Ndola are widely specialized and their experience covers all conceivable employments. Medical workers, teachers, librarians, priests and other professions which require deep specialization are represented, as well as unskilled workers, salesmen and others. The wide distribution

of urban agriculture across a wide spectrum of occupations suggests that UA is not restricted to unemployed people and that it is a significant contributor to household well-being (Mwitwa, 2008).

The main obstacles for urban agriculture in Ndola are usually connected with access to water and land tenure. Land issues originate from the fact that Ndola city does not include urban agriculture in its land-use planning and policies. This problem is linked with the ownership of the land. In many cases, the owner is not known or the land belongs to the City Council. The majority of farmers do not have title deeds for the land they occupy even though it is used for backyard gardening. Additionally, Ndola City Council does not consider urban agriculture as a legitimate activity (MDP-ESA, RUAF Foundation, 2008). Henry M. (2013) mentioned that there have been cases where the City Council slashed crops (maize usually) found in open spaces. This phenomenon was common, particularly during the wet season before the crops matured. The justification for such behaviour was lead by aesthetic reasons. He also claimed that the Ministry of Agriculture and Cooperatives tries to help the farmers with the title deeds. MACO very often enforces the cooperative policy which guarantees the title deeds for the established cooperative.

A positive shift in the perception of urban agriculture by Ndola City Council happened in 2008 when the four years Cities Farming for the Future[34] project was near the end. In that year, *Urban Agriculture Strategy Agenda* and *Urban and Peri-urban Agriculture Policy* were created by the Multiple-Stakeholder Platform (RUAF Foundation, 2014). Both documents ensured the recognition of urban and peri-urban agriculture by the Ndola City Council. Henry M. (2013) concludes that after the release and adoption of the documents, the City Council has changed his position towards the concept and urban agriculture has been legitimized. Today, MACO supports urban agriculture by providing trainings[35] together with the coordination of several projects (independently on the RUAF Foundation or under the cooperation with the RUAF Foundation).

[34] Project lasted from 2005 to 2008.
[35] DACO extension officers provide trainings for farmers if they are invited by the group of farmers.

5.4. Characteristics of Urban Agriculture in Chipulukusu

Urban agriculture is placed traditionally in Chipulukusu. The area is not suitable for building construction and it does not have any other potential for economic development as the fields are located in a flood area and are strongly waterlogged. This makes Chipulukusu an ideal place for agriculture where crops can be grown through the year (Davies M., Benard Ch., 2013).

Figure 1: *Farming area in Chipulukusu*

Source: Google maps (2014)

The growing of rain-fed crops and the gardening of rape, chinese cabbage, spinach, pumpkin leaves and other leafy vegetable is done in the area (Phiri, 2009). Poultry keeping is rare as it requires high capital inputs. If some chickens are reared it happens within the built up area while crop production is carried out outside the township in open space (Mwitwa, 2008). Even though Chipulukusu is a low-income area, the use of fertilizers and pesticides is very common. Organic matter is used

by ploughing in decayed plants and chicken manure. On the other hand, farmers are skilled in crop rotation and they combine different plants together[36].

Figure 2: *Example of plant combination: maize and pumpkin leaves*

Source: Author

Furthermore, no legal land tenure occurs in the area (Mwitwa, 2008). Davies M. (2013a) concluded that all farmers are squatting illegally on land belonging to the City Council. Conversely, the land market has been developed. The land utilization is based on the *first come, first served* principle. People who have been farming for decades became landlords and newcomers have to buy or rent the land. Even though the land rights are unsecured, farmers do not feel endangered. James N. (2013) described the mechanism clearly: *"I have inherited my plots from my parents. Those who are not so lucky, have to ask others to provide them with a field when they want to start farming. Another option is to start to cultivate a new piece of land, but it is not very profitable as ploughing is a hard job and the results only show after a long period of time."*

[36] Farming practice in Chipulukusu can be indicated as *peramculture*. What is popular in the western countries, it is the matter of survival in the developing world.

5.5. Chipulukusu Vegetable Growers Society

The case study focuses on the Chipulukusu Vegetable Growers Society. At the beginning, the farmers are introduced in terms of their social status, motivation for farming and earnings from agriculture. The initial part achieves the first three specific objectives (see Table 4). The community aspects are discussed in order to accomplish the three remaining specific objectives. A definition of community, the perception of the From Seed to Table project, and the cooperative are considered. The final part of the chapter has a conclusive character when the final synthesis is made.

All facts contained in the study are based on the results of the author's research. Direct quotes are signified by quotation marks and italics with the name of the respondent at the end of the quotation. These testimonies support the conclusion drawn in the text and they demonstrate some interesting facts about the farmers' lives. Other information refers to the author's own analysis of the data gained.

5.5.1. Who are the Farmers of Chipulukusu Vegetable Growers Society?

Chapter 3.1.2. Urban Farmers and Their Motivation aimed to introduce the urban farmers. Attention was paid to their social status, their gender, and whether or not they were recent immigrants from rural areas. Also the motivation of the farmers was considered. Based on the common features given in chapter 3.1.2., raw conclusions can be made: most urban farmers live in the developing countries and belong to low-income groups. Among them, the majority are women. The myth that urban farmers are recent migrants from villages was disproved. Reflecting the social status, the most pronounced motivation was food security.

These presumptions are linked to the results of the research and based on that conclusions about the farmers' characteristics can be drawn. It must be mentioned, that the sample of interviewees is quite small and some details could therefore be biased[37].

1. Sex, age, marital status, household characteristics, migration and motivation

[37] For instance, the income earned by urban agriculture can be lower or higher than the average among farmers in the area, considering the fact that the farmers of the Chipulukusu Vegetable Growing Society are affected by external intervention, while the rest of the farming community was not.

These indicators are substantial in understanding the background of the farmers and to determine the importance of urban agriculture. Eleven of the respondents were men and seven were women. While male farmers are always the heads of household, the situation among women differs from case to case. Three women farm to help their husbands with the cultivation and thus contribute to the household budget. Two women declare that their husbands have different occupations and their role in the household is more or less supportive. The rest of the women's sample represents female headed households, thus the income from urban agriculture is crucial to the maintenance of their livelihoods.

The age of the farmers ranges from 20 to 69. The household size is 7 people on average but in the extreme case farmers have to take care of 14 household members (children and other dependants[38]). Usually, the rest of a farmer's family does not have any occupation, therefore the household depends only on urban agriculture[39]. The majority of household members are school children and the women take care of them. Children and women usually help with the field work during the weekends and free time.

None of the interviewees was a recent migrant to Ndola. All the farmers have lived in the city for at least 5 years. Conversely, only two respondents were born in Ndola, while the rest moved there from smaller towns or villages[40]. However, native Ndolan are rare the other farmers moved to Ndola and many have lived there for a long time.

The majority of farmers have experience with formal and informal work[41]. Although they used to be employed they decided to start with agriculture. The most common answer concerning their motivation was that urban agriculture is the only way to satisfy a farmer's life. Some farmers stated that in the time when they were employed (formally or informally) the salaries were too low and were received with delays. Three respondents were running their own small business (street vendors, kiosks and others).

[38] Poor Zambians very often get benefits from their relatives who are better-off. It is very typical that if a family is not able to feed their children the parents send some of them to the relatives. Traditionally, kinsmen cannot refuse those children.
[39] Only four respondents answered that another household member has an occupation.
[40] Farmers' origins vary across Zambia.
[41] Two interviewees stated that they decided to start farming without previous employment experience because their parents were also farmers.

All respondents agreed that urban agriculture was the most secure employment they had had. Though they had experienced many positions, farming seemed to be the most promising livelihood strategy in terms of independence. The farmers concluded that it was always better to rely on themselves rather than to be employed somewhere and waiting for a salary each month.

"My situation is very complicated. I do not have any education and my husband left me with my four children. I got a maid job but I did not get my salary on time and I was not able to feed my kids. Then I saw people farming around and I started to learn about farming. It is not an easy job but at least I can sustain my live." Mary Ch. (2013)

"I have been farming for five years. I run a small shop with food before but then I left it to my wife and I have started with farming. I saw all those people farm around and they are all doing well. So I decided to join them because I wanted to extend our income. But it is still important to maintain both the shop and the field, to be more secure if either of these two fail." Piyhson T. (2013)

"We, my husband and I, are both farmers. My husband was the first farmer in our household and when my youngest son started at school I decided to help my husband. Today, I have my plots and my husband has his. We farm more or less independently but we combine our income." Esnart M. (2013)

"In my life I went through many jobs. I used to work in a lime factory and I served as a gardener. Today, I have been farming for 20 years and I do not complain. It is the best option, even though some constraints are present." Francis Ch. (2013)

"My husband is employed in ZESCO[42] *but it is more or less a temporary occupation. He receives a new contract each month and so every month we live in fear that his contract will not be prolonged. So we decided three years ago to start with agriculture. Today, we maintain two small plots to provide food for our family and for surplus selling."* Albetina Ch. (2013)

[42] Zambia Electricity Supply Corporation.

Finally, several interesting characteristics result from the interviews, especially where motivation is concerned. Urban agriculture in Chipulukusu is usually a full-time occupation. Therefore almost all the farmers are market oriented, even though they farm on a small-scale. It implies that food security, the most pronounced motivation for urban agriculture, is hidden behind the need for employment. Also the motivation of the women differs. While the men proclaim that urban agriculture is a sort of occupation and they perceive farming as a full-time job, the women's intentions vary depending on their life situation and position in their household.

The proportion of women is also questionable. When passing through the Chipulukusu farming area, the first impression is that it is mostly women who take care of the fields. This image can be misleading while considering Davies M. (2013b) remark that actually many women are hired and paid by the owner of the plot to do a weeding, watering and ploughing.

2. Income level, food and other spending, crop marketing

The results shown in the previous part prove that income generation is the most significant factor for all those engaged in farming. Those people usually failed on the labour market and the income gained through urban agriculture is crucial for their survival. While farmers state that urban agriculture represents the most stable source of money, the question about their average weekly earnings partly contradict that statement.

Income gained through urban agriculture differs depending on the crops sold. The average weekly income is from 60 – 120 ZMK[43], depending on the size of the cultivated plots. Furthermore, earnings also vary in terms of the crop. For instance, selling maize during the dry season is very profitable because it is scarce and the price is very high. When selling such maize, farmers can even earn 400 ZMK per week. Conversely, when the leafy vegetable is marketed, then the earnings are the lowest and the income is about 30 – 40 ZMK. Moreover, the income level also depends on the farmer's ability, knowledge of agriculture and capital input. Leafy vegetables require low capital inputs and also no special knowledge about the life cycle

[43] ZMK is Zambian Kwacha, 1 USD is 6.5 ZMK.

of the plant. Maize and tomatoes are the most advanced crops, which demand high capital inputs (fertilizers, pesticides) and also certain agricultural skills[44].

"When the winter maize is ready, I can earn even 500 ZMK. But when I am selling only rape or chinese cabbage then my income is quite low. I can sell something every week but sometimes I get 100 ZMK and sometimes only 50 ZMK." Demar M. (2013).

"I do not have enough money to plant maize and tomatoes because they need many fertilizers, which I cannot afford to buy. That is why I am growing leafy vegetables mainly. On the other hand, I only have a small plot and it is better to grow something that I can sell each week rather than wait two months for the maize." Mary Ch. (2013)

The farmers usually spend all they earn on food and other expenditure. They can certainly provide part of their diet from their plots but they still have to buy mielie-meal[45] and other foods. All the farmers also send their children to school which means extra spending. Finally, there is the need for agricultural inputs: seeds, seedlings, fertilizers, pesticides and fungicides. The farmers agree that such inputs are very expensive. Furthermore, some farmers also hire poor people from the township when they need additional labour and their own household members are not able to work alongside them. This implies that little of their earnings is saved and the farmers only invest in their children's education and in the inputs needed for farming. Some farmers are better-off than others, such as the case of Piyhson T. (quotation below).

"I have 9 dependants in my household and I have to feed them all. Usually I spend more on food than I earn. What is left I have to invest in fertilizers. Sometimes, especially when the maize is ready, I hire women and kids from the compound and they help me with the harvest." Davison L. (2013)

[44] Conversely, Mwitwa (2008) states that farmers in Chipulukusu earn their incomes more than five times per year. It implies that short rotation and irrigated cropping systems are utilized. Such systems produce leafy vegetable while maize is typical of a long rotation crop.

[45] Mielie-meal is flour made from maize and it is used in the preparation of *nshima*, a traditional Zambian food which is the local staple food (and the only meal consumed by the poor, in principle).

"I have two little kids and they are not of school age yet. Thanks to farming I have built a new house and now I even have electricity. Together with my wife we are creating some savings for when the children will grow up." Piyhson T. (2013)

One very interesting and unexpected finding concerns the marketing of the crops. Farmers do not sell their crops on their own but more often than not use the services of family members and middlemen. Marketing of the products via middlemen causes financial losses which can be quite significant. Direct marketing can be an option for an improvement of income but time scarcity and little or no orientation on the markets limit this option. Such circumstances create optimal conditions for the middlemen who come to the farming areas every day and wait for farmers who want to sell their crops. Farmers usually sell their products once per week or two weeks.

"Every Friday the middleman comes to the fields. There is a predefined position where we meet. Sometimes he comes directly to my plot, especially at the time of maize. I do not complain about the lower price I get via the middleman." John N. (2013)

"Sometimes I ask one of my seven children to sell my crop. But when the maize is ready for the market, than I go to the middleman because it is more comfortable." Evelyne B. (2013)

The low level of savings and the marketing seems to be the major obstacles for the farmers. Nevertheless, there is certain solution in terms of the farmers' unification and legal recognition. The From Seed to Table project aimed to develop links for better marketing options. Thus, the result of the project was the establishment of a cooperative. The development of the cooperative will be discussed in a later chapter.

5.5.2. Community, Cooperative and Chipulukusu Vegetable Growers Society

It has already been said that community is a crucial driving force for development. This is true also for the farmers of Chipulukusu. One of the results of the FSTT project was an establishment of the cooperative. This act plays a very significant role in the lives of farmers and this chapter aims to analyse the meaning of community for the farmers, the importance of the cooperative and the causes of the failure of the cooperative.

The information given below is based on interviews and discussions and on the outcomes of focus groups. To clarify the difference among the author's conclusion, information from interview and statements of the focus group, each group is marked specifically. Thus the direct and indirect quotations will be signified as follows: FC1, FC2, FC3, FC4. FC1 and FC2 refer to groups belonging to Davies M. while FC3 and FC4 l are groups under Benard Ch.

Moreover, the data gained through focus group discussions were deeper than those from individual interviews. Therefore the personal conversations are more sporadic forms of evidence than the testimonies of the focus group. Group discussion is perceived as a more proper tool for the exploration of specific objectives 4, 5 and 6. The advantage was especially clear when some farmers were able to react to the answers of the others and to provide further specific information.

1. Community, Cooperative and the From Seed to Table Project

The first intention of this part is to clarify the term *community* and its perception by farmers. While the author presumed that community is a body of strong social cohesion and solidarity is in first place, the farmers' perception was absolutely different.

The farmers understand community as something present, something they belong to. They are aware that it is preferable to be part of a group to ensure certain social safety net. One of the major arguments was the help during the funeral[46]. The second most frequent answer referred to the knowledge and skills.

[46] A funeral is a momentous event in Zambian society and high importance is attached to the arrangements. It is the duty of the relatives to organize a splendid celebration, otherwise the family will be shamed.

"When my son died I did not have enough money to pay for his funeral. So I went to my neighbours and asked them for help. They lent me some kwacha to pay the expenses and they even helped me to make some arrangements." Osia Ch. (2013)

"I was not a part of the FSTT project because I started with farming after the end of the project. When I first came to my plot I knew very little about farming. I was very lucky to meet these people because they gave me a lot of advices at the beginning." Phillip M. (2013)

Individual testimonies were supported by the group discussions. For example, FC1 (2013) defines community as *"a place where people live. They all work separately but if something happens they collaborate and help each other."* FC2 (2013) characterized community as a *"group of people who live and work together, where knowledge is spread and ideas are shared."* All focus groups also confirm that they are able to help each other in time of crisis.

The farmers did not really mention, during the individual interviews, the relationship between community, the FSTT and further development. Only FC2 (2013) mentioned that community is a fundamental element for the establishment of a cooperative. This is reflected in the fact that the farmers work independently today. If they cooperate it is only occasionally for the purpose of irrigation channel cleaning and civil patrols[47] (FC1, 2013; FC2, 2013; FC3, 2013; FC4, 2013). FC3 and FC4 seem to be more advanced in terms of collaboration. Both groups acknowledge that they hold regular meeting to set the price of maize and tomatoes. They conclude that it is good to sell the products for the same prices because it reduces the competitiveness.

Above mentioned statements were also seen as the advantage of community. Interviewees and the focus groups felt comfortable with the view that mutual help and knowledge sharing is the most valuable benefit.

Conversely, some negative aspects of work within the community were found. While individuals were left out of this question, group discussions showed significant problems. FC1 (2013) sees the leadership as a major obstacle: *"When the leadership is bad, then conflicts arise. If we want to be successful community, we need to have good*

[47] Farmers tend to organize civil patrols because the pilfering of mature crops (maize and tomatoes in particular) happens quite often.

leadership." Moreover, this statement was common for all four groups. Only FC2 (2013) added another constraint: *"It sometimes happens that someone works harder than the others. Those who are lazy benefit from us. So an equal division of the work should be arranged."*

Additionally, FC4 (2013) also identified problems which can be solved through better organisation. It happens that some farmers have large plots but they do not have enough inputs. Then the land is useless because nobody cultivates the soil and it becomes depreciated. Probably the most relevant problem concerns marketing and competitiveness. All farmers grow the same crops (mostly leafy vegetable), therefore it is difficult to succeed at the markets. They call for diversification of crops but they are aware that this requires a higher level of management.

Finally, better management and coordination of farmers were the aims of the FSTT project. It has already been said that the establishment of the cooperative was fundamental for the project and also for the farmers. The interviews indicated that FSTT was significant for the individuals and the community. At the individual level, the benefits were linked primarily to knowledge and skills, whilst the cooperative was the major issue at the community level. On the other hand there were complains. They referred especially to the lack of interest shown by the DACO office after the project ended.

"Officers from DACO came to Chipulukusu and they trained us in agricultural practices. I learnt how much fertilizer I must apply to grow nice tomatoes. Before the project I used larger amounts of fertilizer than were needed. So today I apply the exact quantity of fertilizer which is good for the soil and also for me because I save a lot of money." Promise K. (2013).

"Even though I did not participate in the FSTT project I can still benefit. My friends have learnt a lot during the project and when I started farming, they were able to give me a lot of advice." Phillip M. (2013)

"The FSTT project was good for all of us. But when it was over, nobody cared about us. We went to the office many times but nobody wanted to help us with the renewal of the cooperative." Davies M. (2013b)

Chapter 5.5.1. discussed the socio-economic status of the farmers. There is an evident link between income level, spending and the farmer's will to establish a cooperative. Henry M. (2013) stated that the cooperative is an appropriate tool for the farmers if they want to advance their production. Also farmers are familiar with the advantages of the cooperative. Focus groups were asked about the cooperative and the FSTT project more broadly than the individuals[48] thus the most interesting points came from the group discussions.

"We use our land illegally but when we are recognized officially we will get a title deed. When we are a cooperative again, we can enter the formal markets and we can possibly supply our products to the hotels and restaurants. We can also get a bank account and use other financial services. Finally, as cooperative members we can receive seeds and fertilizer at subsidised prices from the government." Davies M. and Benard Ch. (2013)

This brief description of the cooperative benefits was communicated to the author at the beginning of the research. Individual interviews and focus groups also support the conclusions of Davies M. and Benard Ch. FC2 (2013) alone mentioned that the cooperative can also bring formal employment to the community.

"The cooperative structure allows for a few paid positions in the hierarchy and the further extension of the cooperative can cover other people from Chipulukusu." FC2 (2013)

The advantages of the community and the cooperative appear to be different when a brief overview is made. However, when the disadvantages and problems of the community and the cooperative were explored, certain similarities were found. For example, all groups mentioned the problems of leadership, lazy co-workers and a lack of collaboration. Yet, on some points there were drawn clear differences between the community and the cooperative. FC1 (2013) stated that the rules are the essence: *"When the cooperative does not have rules or they are not adhered to, then the cooperative does not make any sense."* FC4 (2013) went much deeper when they said that actually no one can be forced to become a cooperative member thus membership should only be voluntary.

[48] Individuals stated that the greatest benefits of the project were trainings and acquired skills.

An interesting phenomenon occurred when the cooperative was discussed during the focus groups. The answers to questions concerning the community were more or less the same for all groups. Once the specific questions concerning the cooperative were answered, FC1 and FC2 made different statements to FC3 and FC4. The disparity could be caused by the different perceptions of the cooperative and its failure within the groups of Davies M. and Benard Ch.

For instance, FC1 (2013) and FC2 (2013) concluded that the idea of the cooperative was present among the farmers prior to the FSTT project. According to these groups, FSTT fulfilled the function of mediator and helped the farmers with the process of registration and in setting up bank account. Conversely, FC3 (2013) and FC4 (2013) stated that the community was viable before the project but the idea of the cooperative came with the project. In the extreme cases, some members blamed the project for the failure because it selected the leaders unnaturally[49].

The same scenario was repeated when the duration of the existence of the cooperative was discussed. Each group had a different opinion about the period of time that the cooperative actually worked. While FC1 (2013) concluded that the cooperative was viable for almost one year, FC2 (2013) said that it succeeded for two and half years. FC3 (2013) and FC4 (2013) agreed that the cooperative had never been a functioning body. They also stated that the cooperative had failed during the process of transformation from the interim phase to becoming a fully recognized organisation because a new leadership election could not be held.

2. Failure of the Cooperative, Lessons Learned

The key issues discussed during the focus group meetings were the failure of the cooperative and the lessons learned. Even though the farmers were familiar with the causes of the breakdown, a specific flabbiness and lack of motivation inhibited the renewal efforts. Repeatedly, FC1 and FC2 gave particularly different reasons to FC3 and FC4. This section is only based on the focus group discussions since this point was not a subject of individual interviews.

Before the results of focus groups are given, a clarification of the situation has to be outlined. The FSTT project has set an interim cooperative with an interim

[49] This testimony cannot be thought as the statement of the whole focus group.

leadership[50]. When the project came to an end, the farmers should have re-established the cooperative under specific circumstances. A new leadership election should have been held and members would have had to pay their membership fees once again, but this effort failed. Actually, these were the only two conditions which should have been met by the farmers to ensure the cooperative's renewal. The foundation of the cooperative is also conditioned by the existence of a business plan and the by-laws. These two documents were created during the project with the assistance of DACO (Demar M., Benard Ch., 2013).

All groups agreed that the problems with leadership were the essence of the failure. FC1 (2013) stated that the poor direction of the cooperative led to unfair sharing. Such conditions discouraged farmers from their further participation. Additionally, FC3 (2013) and FC4 (2013) had other comments, which included fights among the interim leaders and community leaders. These circumstances stopped many of farmers from paying of membership fee again, as they feared for their investment.

"Only five people were willing to pay the membership fee again but for the new election at least fifteen fully paid members are required. Therefore we were not able to organize a new leadership election and the cooperative could not be registered officially." FC3 (2013)

The crucial point for the re-establishment of cooperative is the awareness of the farmers' mistakes as well as an understanding of the changes needed. All groups referred to much the same issues so only partial testimonies are quoted. They all agreed that changes in leadership were essential to success. For example, FC1 (2013) stated, that the leaders should be chosen more carefully with respect to their transparency and honour. FC2 (2013) added: *"The leaders of the former cooperative should not be the part of the management again. Furthermore, the cooperative (sharing in particular) should be supervised and monitored by the government. The new leaders should attend DACO's trainings and teach us what they learn there."*

"Our cooperative had too many leaders and it was just confusing. For our new establishment we demand a shorter list of responsible persons." FC3 (2013).

[50] The project leaders were elected at the beginning of the FSTT project. This leadership was transmitted directly to the cooperative. Conflict emerged when other influential people claimed their right to leadership.

Other notes considered the position of members and internal relationships. All groups demanded only motivated members as they do not want to pay for those who do not work hard (FC1, 2013; FC2, 2013; FC3, 2013; FC4, 2013). There should also be a limit on the initial number of members.

"If we re-establish the cooperative again we have to be safeguarded against the situation when leaders start to prefer some members before others. It is the only way to secure equal sharing and distribution of inputs." FC2 (2013)

"It is much better to start with 15 members and to expand our cooperative later than to establish the cooperative with 100 members and lose them over time. Furthermore, if other farmers see that we are successful they will want to join us." FC4 (2013)

Even though the farmers know exactly what went wrong and what has to be done for the renewal of the cooperative, they all lack the motivation for collective action. There is no way to bring both groups together and make them cooperate[51] and probably no chance of renewing the cooperative without external intervention.

[51] One of the intentions of the group discussions was to organize a meeting where both groups will come together and to present them the results of discussion. Unfortunately, members of FC1 and FC2 were strictly against this idea.

5.6. The Results Discussion

The case of the Chipulukusu Vegetable Growers Society is a comprehensive study of community-based urban agriculture. The farmers' backgrounds and their motivations were outlined at the beginning. These findings matched the overview made in chapter 3.1.2. Urban Farmers and their Motivation. The farmers of Chipulukusu are a typical example of poor people who are engaged in urban agriculture because of the need to sustain their lives. Also the presumption that women predominate among urban farmers was confirmed, although the sample of female farmers in the research was smaller than male farmers. It seems that men are mostly the owners of the plots but women are the major section of the work force.

The findings of the research also confirm some of the benefits of urban agriculture explored in chapter 3.2. Benefits and Threats of Urban Agriculture, especially food security and the socio-economic impact. The significance of urban agriculture in terms of food security is clear. The socio-economic contributions can be divided into two dimensions. At the individual level, farming positively affects household well-being. At the community level, the farmers of Chipulukusu created additional jobs for others living in the area. There is evidence that at times the owners of plots hire workers to maintain their plots. Thus the secondary effect of urban agriculture is seen when the benefits are spread around the community.

The average weekly income of the farmers was explored. It was found that it varies according to the crops. The diversification of production results in an instability in the farmers' incomes. Leafy vegetable production signifies a lower income while maize and tomatoes imply higher earnings. The farmers' crop orientation differs in line with their abilities and skills. Also the marketing process was described. Farmers usually trade with a middleman instead of direct retail.

As this thesis is focused mainly on CBUA, special attention was paid to the perception of community. The research showed that the farmers' community is not a body of strong social cohesion it is more a tool for the achievement of success. This premise was utilized by the FSTT project which implemented the idea of a cooperative. All the farmers agreed on the major benefits of the cooperative:

title deeds, subsidies from the government, official recognition and access to financial services.

The cooperative was the essence of the project but it did not succeed. The breakdown was caused by the leadership problems and power seeking. All the farmers interviewed were familiar with the reasons why did the cooperative failed as well as with the changes needed for its re-establishment. No matter that the farmers are aware, there is probably no chance of renewing the cooperative, as the former group was divided into two bodies which had no interest in common collaboration. Additionally, the farmers are strongly discouraged from paying a membership fee as they are afraid that the cooperative will fail again because the internal problems remain unsolved.

Concerning the From Seed to Table project, the farmers saw many benefits. The most pronounced benefit was the knowledge gained about agricultural practices and the improvement of their skills. At the community level, the idea of a cooperative and the following interim registration are appreciated. Conversely, farmers complained about the lack of attention from DACO after the completion of the project. However, this can be explained. The aim of the FSTT project was to establish a cooperative and its success was expected[52]. When the cooperative failed, DACO had no reason to continue supervision of the farmers.

Even though the farmers of Chipulukusu were affected by the intervention of the RUAF Foundation, they are still viable and represent a clear example of a community where the people are absolutely familiar with agriculture. Therefore it is possible to conclude that the Chipulukusu Vegetable Growers Society epitomizes the archetype of community-based urban agriculture.

[52] DACO is an official institution which registers cooperatives and provides them with training and other services.

CONCLUSION

Urban agriculture is one of the phenomena that are connected to rising urbanisation rates. Its significance increases with the poverty levels of the urban population. Therefore the concept is particularly important in the developing countries. This assumption is followed by the findings made in this paper. Each chapter has its own brief conclusions so the findings are discussed separately.

The structure of the study corresponds with the aims of the thesis. Chapter 3. describes in depth the characteristics of urban agriculture. These findings are crucial for a comprehensive understanding of the whole concept and they also facilitate the results of the field research. The analysis of the major benefits and risks is complete.

Chapter 4. focuses on the phenomenon of community-based urban agriculture. Two major forms of CBUA are outlined and reference is made to specific case studies which characterize the top-down approach to the concept. This part confirms statements given in chapter 3. CBUA has a positive impact on disadvantaged people as it enhances their skills, integrates them into social structures and strengthens their empowerment.

The case study of the Chipulukusu Vegetable Growers Society is contained in chapter 5. The methodology is described in detail as well as the characteristics of the study site. The results of the research are widely discussed in chapter 5.6. and the conclusion is made. The Chipulukusu Vegetable Growers Society is a typical example of the bottom-up approach to community-based urban agriculture.

The results of the thesis provide evidence that urban agriculture is a viable concept which should not be neglected by governments, NGOs and other institutions. Probably the most important advantage of urban agriculture is that it does not depend greatly on development aid and it can significantly reduce poverty. When urban agriculture has the attention of the policy makers, many changes can be made, as shown in the case of Ndola, Zambia.

BIBLIOGRAPHY

ALTIERI, M.A., et al. (1999) The greening of the "barrios": Urban agriculture for food security in Cuba. *Agriculture and Human Values*, 16.

ARMAR-KLEMESU, M. (2000) Urban Agriculture and Food Security, Nutrition and Health. In: Bakker, N., Dubbeling, M., Guendel, S., Sabel Koschella, U., de Zeeuw, H. (eds.) *Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda* [online]. Feldafing: DSE. Pp. 99 – 117. Available at: http://www.ruaf.org/publications/growing-cities-growing-food-urban-agriculture-policy-agenda.

BANERJEE, A.V.; DUFLO, E. (2007) The Economic Lives of the Poor. *Journal of Economic Perspectives*, vol. 21, no. 1, Winter 2007, pp. 141 – 167.

BENARD CH. (2013) Personal conversation. August 5th 2013. Ndola, Zambia.

BEUCHLER, S., MEKALA, G. D., KERAITA, B. (2006). Wastewater Use for Urban and Peri-Urban Agriculture. In: van Veenhuizen, R. (ed.) *Cities Farming for the Future: Urban Agriculture for Green and Productive Cities* [online]. RUAF Foundation, IDRC and IIRR. Pp. 241 – 260. Available at: http://www.ruaf.org/publications/cities-farming-future-urban-agriculture-green-and-productive-cities.

BIRLEY, M.H., LOCK, K. (1999). *The Health Impacts of Peri-urban Natural Resource Development* [online]. Liverpool School of Tropical Medicine, Liverpool, UK. Avaliable at: http://www.birleyhia.co.uk/wordpress/wp-content/uploads/2011/07/periurbanhia.pdf.

BRYLD, E. (2003) Potentials, Problems, and Policy Implications for Urban Agriculture in Developing Countries. *Agriculture and Human Values*, 20, pp. 79 – 86.

BROWN, K.H.,; JAMETON, A.L. (2000), Public Health Implications of Urban Agriculture. *Journal of Public Health Policy*, vol. 21, no. 1 (2000), pp. 20 – 39.

COFIE, O., ADAM-BRADFORD, A., DRECHSEL, P. (2006). Recycling of Urban Organic Waste for Urban Agriculture. In: van Veenhuizen, R. (ed.) *Cities Farming for the Future: Urban Agriculture for Green and Productive Cities* [online]. RUAF http://www.ruaf.org/publications/cities-farming-future-urban-agriculture-green-and-productive-cities.

CSO (2011). *2010 Census of Population and Housing: Preliminary Population Figures.* Central Statistical Office. Zambia.

DAVIES M. (2013a) Personal conversation. August 1st 2013. Ndola, Zambia.

DAVIES M. (2013b) Personal conversation. August 5th 2013. Ndola, Zambia.

DAVIES M., BENARD CH. (2013) Personal conversation. July 30th 2013. Ndola, Zambia.

DAVISON L. (2013) Personal conversation. September 9th. Ndola, Zambia.

DE NEERGAARD, A., DRESCHER, A. W., KOUAMÉ, CH. (2009) Urban and Peri-Urban Agriculture in African Cities. In: Shackleton, Ch. M., Pasquini, M. W., Drescher, A. W. (eds.) *African Indigenous Vegetables in Urban Agriculture.* Earthscan London. Pp. 35 – 64.

DEELSTRA, T., GIRARDET, H, (2000) Urban Agriculture and Sustainable Cities. In: Bakker, N., Dubbeling, M., Guendel, S., Sabel Koschella, U., de Zeeuw, H. (eds.) *Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda* [online]. Feldafing: DSE. Pp. 43 - 64. Avaliable at: http://www.ruaf.org/publications/growing-cities-growing-food-urban-agriculture-policy-agenda.

DEMAR M. (2013) Personal conversation. August 22nd 2013. Ndola, Zambia.

DEMAR M., BENARD CH. (2013) Personal conversation. September 10th 2013. Ndola, Zambia.

DRESCHER, A.W., JACOBI, P., AMEND, J. (2000) Urban Agriculture, a Response to Crisis? *Urban Agriculture Magazine* [online], no. 1. Available at: http://www.ruaf.org/urban-agriculture-response-crisis.

ELLIS, F., SUMBERG, J. (1998) Food Production, Urban Areas and Policy Responses. *World Development*, Vol. 26, No. 2, pp. 213 – 225.

ESNART M. (2013) Personal conversation. August 12th 2013. Ndola, Zambia.

EVELYNE M. (2013) Personal conversation. August 18th 2013. Ndola, Zambia.

FC1 (2013) Focus group. September 16th 2013. Ndola, Zambia.

FC2 (2013) Focus group. September 18th 2013. Ndola, Zambia.

FC3 (2013) Focus group. September 20th 2013. Ndola, Zambia.

FC4 (2013) Focus group. September 24rd 2013. Ndola, Zambia.

FOOD AND AGRICULTURE ORGANIZATION (2012) *Growing Greener Cities in Africa: First status report on urban and peri-urban horticulture in Africa*. Rome. Food and Agriculture Organization of the United Nations.

FRANCIS CH. (2013) Personal conversation. September 2nd 2013. Ndola, Zambia.

GOOGLE MAPS (2014) Available at: https://maps.google.com/.

GUITART, D, PICKERING, C., BYRNE, J. (2012) Past Results and Future Directions in Urban Community Gardens Research. *Urban Forestry & Urban Greening*, 11, 2012, pp. 364 – 373.

HENRY M. (2013) Personal conversation. September 26th 2013. Ndola, Zambia.

HOVORKA, A. (2009) Gender in Urban Agriculture: an Introduction. In: Hovorka, A., de Zeeuw, H., Njenga, M (eds.) *Women Feeding Cities: Mainstreaming gender in Urban Agriculture and Food Security* [online]. Practical Action Publishing, Rugby, UK. Pp. 1 – 32. Available at: http://www.ruaf.org/sites/default/files/Chapter%201%20Introduction.pdf.

JACOBI, P., AMEND, J., KIANGO, S., (2000) Urban agriculture in Dar es Salaam: providing for an indispensable part of the diet. In: Bakker, N., Dubbeling, M., Guendel, S., Sabel Koschella, U., de Zeeuw, H. (eds.) *Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda* [online]. Feldafing: DSE. Pp. 257 – 283. Available at: http://www.ruaf.org/publications/growing-cities-growing-food-urban-agriculture-policy-agenda.

JAMES N. (2013) Personal conversation. Agust 12th 2013. Ndola, Zambia.

JANSEN, J. B. (2009) The Accidental City: Urbanisation in an East-African Refugee Camp. *Urban Agriculture Magazine* [online], No. 21, January 2009. Available at: http://www.ruaf.org/ua-magazine-no-21-linking-relief-rehabilitation-and-development-role-urban-agriculture.

JOHN N. (2013) Personal conversation. August 14th 2013. Ndola, Zambia.

KALEMBA, B. (2013) *Community Participation in Education Delivery: A Study of How Community Schools Target OVCs in Chipulukusu, Zambia.* MPhil Theses. Norwegian University of Science and Technology, Trondheim, Norway.

KARAAN, A.S.M., MOHAMED, M. (1998) The Performance and Support of Food Gardens in some Townships of the Cape Metropolitan Area: An Evaluation of Abalimi Bezekhaya. *Development Southern Africa.* Vol. 15, No. 1, Autumn 1998. Pp. 67 – 83.

LEE-SMITH, D. (2010) Cities Feeding People: an Update on Urban Agriculture in Equatorial Africa. *Environment & Urbanization*, Vol. 22, No. 2, Oct 2010.

LIEF, M. (2007) A Response to a Growing Crisis: Urban Food Gardening in South Africa's Townships. *Urban Agriculture Magazine* [online]. No. 18. Available at: http://www.ruaf.org/ua-magazine-no-18-building-communities-through-urban-agriculture.

MANSURI, G., RAO, V. (2004) Community-Based and -Driven Development: A Critical Review. *The World Bank Research Observer* [online]. Vol. 19, No. 1. Available at: http://wbro.oxfordjournals.org/content/19/1/1.full.pdf.

MARY CH. (2013) Personal conversation. August 28th 2013. Ndola, Zambia.

MAXWELL, D. G. (1995) Alternative Food Security Strategy: A Household Analysis of Urban Agriculture in Kampala. *World Development*, Vol. 23, Issue 10, October 1995, pp. 1669 – 1681.

MAXWELL, D. G., LEVIN, C., CSETE, J. (1998) Does Urban Agriculture Help Prevent Malnutrition? Evidence from Kampala. *Food Policy*, Vol. 23, No. 5, pp. 411 – 424.

MAXWELL, D. G. (1999) Urban Food Security in Sub-Saharan Africa. In: Koc, M., MacRae, R., Mougeot, L.J.A., Welsh, J. (eds.) *For Hunger Proof Cities: Sustainable Urban Food System.* Torronto. IDRC 1999. ISBN: 0-88936-882-1. Pp. 26 – 29.

MBIBA, B. (2000) Urban Agriculture in Harare: Between Suspicion and Repression. In: Bakker, N., Dubbeling, M., Guendel, S., Sabel Koschella, U., de Zeeuw, H. (eds.) *Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda* [online]. Feldafing: DSE. Pp. 285 – 301. Available at: http://www.ruaf.org/publications/growing-cities-growing-food-urban-agriculture-policy-agenda.

MDP-ESA, RUAF Foundation (2008). *Summary of Key Issues and Recommendations on Urban Agriculture.* June 2008.

MOUGEOT, L.J.A. (2000). Urban Agriculture: Definitions, Presence, Potentials and Risks. In: Bakker, N., Dubbeling, M., Guendel, S., Sabel Koschella, U., de Zeeuw, H. (eds.) *Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda* [online]. Feldafing: DSE. Pp. 1-42. Available at: http://www.ruaf.org/publications/growing-cities-growing-food-urban-agriculture-policy-agenda.

MOUGEOT, L.J.A. (2005). Introduction. In Mougeot, L.J.A. (ed.) *Agropolis: The Social, Political and Environmental Dimensions of Urban Agriculture.* Earthscan, London. Pp. 1 – 29.

MOUGEOT, L.J.A. (2006). *Growing Better Cities: urban agriculture for sustainable development* [online]. Ottawa. IDRC 2006. ISBN: 1-55250-226-0 / 118 pg. Available at: http://www.idrc.ca/EN/Resources/Publications/Pages/IDRCBookDetails.aspx?PublicationID=327.

MOUSTIER, P. (2001). Assessing the Socio-Economic Impact. *Urban Agriculture Magazine* [online]. No. 5, December 2001. Available at: http://www.ruaf.org/assessing-socio-economic-impact.

MOUSTIER, P., DANSO, G. (2006). Local Economic Development and Marketing of Urban Produced Food. In: van Veenhuizen, R. (ed.) *Cities Farming for the Future: Urban Agriculture for Green and Productive Cities* [online]. RUAF Foundation, IDRC and IIRR. Pp. 173 – 195. Available at: http://www.ruaf.org/publications/cities-farming-future-urban-agriculture-green-and-productive-cities.

MUBVAMI, T., MUSHAMBA, S. (2006) Integration of Agriculture in Urban Land Use Planning. In: van Veenhuizen, R. (ed.) *Cities Farming for the Future: Urban Agriculture for Green and Productive Cities* [online]. RUAF Foundation, IDRC and IIRR. Pp. 53 – 74. Available at: http://www.ruaf.org/publications/cities-farming-future-urban-agriculture-green-and-productive-cities.

MUBVAMI, T., MANYATI, M. (2007) HIV/AIDS, Urban Agriculture and Community Mobilisation: Cases from Zimbabwe. *Urban Agriculture Magazine* [online]. No. 18. Available at: http://www.ruaf.org/ua-magazine-no-18-building-communities-through-urban-agriculture.

MWANGI, A. M. (1995) *The Role of Urban Agriculture for Food Security and Nutrition in Low Income Areas in Nairobi.* Afrika-Studiecentrum, Leiden. [online]. Available at: https://openaccess.leidenuniv.nl/bitstream/handle/1887/479/01PUB0000000088.pdf?sequence=1.

MWITWA, J. (2008) *Farming System Analysis of Ndola Urban and Peri-Urban Agriculture.* MDP-ESA, RUAF Foundation, February 2008.

NEWLAND, K. (1980) City Limits: Emerging Constrains on Urban Growth. *World Watch Paper 38*[online]. Washington DC: World Watch Institute. Dostupné z: http://www.eric.ed.gov/PDFS/ED195606.pdf.

NIKKAH, H.A., REDZUAN, M. (2009) Participation as a medium of empowerment in community development. *European Journal of Social Science*, 11. (1), pp. 170 – 176.

NUGENT, R. (1999). Measuring the Sustainability of Urban Agriculture. In: Koc, M., MacRae, R., Mougeot, L.J.A., Welsh, J. (eds.) *For Hunger-proof Cities: Sustainable Urban Food Systems* Pp. 95 - 99. International Development Research Centre 1999, Canada.

NUGENT, R. (2000). The Impact of Urban Agriculture on the Household and Local Economies. In: Bakker, N., Dubbeling, M., Guendel, S., Sabel Koschella, U., de Zeeuw, H. (eds.) *Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda* [online]. Feldafing: DSE. Pp. 67-97. Available at: http://www.ruaf.org/publications/growing-cities-growing-food-urban-agriculture-policy-agenda.

OSIA CH. (2013) Personal conversation. August 16th 2013. Ndola, Zambia.

PASCAL, P., MWENDE, E. (2009) A Garden in a Sack: Experiences in Kibera, Nairobi. *Urban Agriculture Magazine* [online], No. 21, January 2009. Available at: http://www.ruaf.org/ua-magazine-no-21-linking-relief-rehabilitation-and-development-role-urban-agriculture.

PHILLIP M. (2013) Personal conversation. September 1st 2013. Ndola, Zambia.

PHIRI, O.Y.Z. (2009) *Applied Study on Local Finance for Poor Urban and Peri-Urban Producers.* MDP-ESA, RUAF Foundation, October 2009.

PIYHSON T. (2013) Personal conversation. September 1st 2013. Ndola, Zambia.

POTTS, D. (2005) Counter-urbanization on the Zambian Copperbelt? Interpretations and Implications. *Urban Studies*, Vol. 42, No. 4, pp. 583 – 609, April 2005.

PRAIN, G., LEE-SMITH, D. (2010). Urban Agriculture in Africa: What Has Been Learned? In: Prain, G., Lee-Smith, D., Karanja, N. (eds.) *African Urban Harvest: Agriculture in the Cities of Cameroon, Kenya and Uganda.* International Development Research Centre, International Potato Centre. Pp. 13 – 35.

PROMISE K. (2013). Personal conversation. August 27th 2013. Ndola, Zambia.

RADICE, H. W., VELLY, D. (2009) Farming in Bags: Micro-gardening in Northern Uganda. *Urban Agriculture Magazine* [online], No. 21, January 2009. Available at: http://www.ruaf.org/ua-magazine-no-21-linking-relief-rehabilitation-and-development-role-urban-agriculture.

RAVALLION, M., CHEN, S., SANGRAULA, P. (2007). New Evidence on Urbanization of Global Poverty. *Population and Development Review*, Vol. 33, No. 4 (Dec 2007), pp. 667 – 701.

RIDDEL, B. J., (1992) Things Fall Apart Again: Structural Adjustment Programmes in Sub-Saharan Africa. *The Journal of Modern African Studies*, Vol. 30, No. 1 (Mar., 1992), pp. 53-68.

RITCHIE, J., LEWIS, J. (2003) *Qualitative Research Practice: A Guide for Social Science Students and Researchers.* SAGE Publications,

RUAF Foundation (2014) *Cities Farming for the Future Programme (CFF)* [online] [cit 04-05-2014]. Available at: http://www.ruaf.org/projects/cities-farming-future-programme-cff.

RUEL, M.T., HADDAD, L.J., GARRETT, J.L. (1999). Some Urban Facts of Life: Implication for Research and Policy. International Food Policy Research Institute [online] Available at: http://www.ifpri.cgiar.org/sites/default/files/pubs/divs/fcnd/dp/papers/dp64.pdf.

RUTT, R. L. (2007) Community-Based Urban Agriculture in Two East African Capitals. *Urban Agriculture Magazine* [online]. No. 18. Available at: http://www.ruaf.org/ua-magazine-no-18-building-communities-through-urban-agriculture.

SMIT, J., BAILKEY, M. (2006) Urban Agriculture and the Building of Communities. In: van Veenhuizen, R. (ed.) *Cities Farming for the Future: Urban Agriculture for Green and Productive Cities* [online]. RUAF Foundation, IDRC and IIRR. Pp. 145 – 159. Available at: http://www.ruaf.org/publications/cities-farming-future-urban-agriculture-green-and-productive-cities.

SMIT, J.; NASR, J. (1992). Urban Agriculture for Sustainable Cities: Using Wastes and Idle Land and Water Bodies as Resources. *Environment & Urbanization*, Vol. 4, No. 2, Oct 1992.

SMIT, J.; NASR, J.; RATTA, A. (2001). *Urban Agriculture : Food, Jobs and Sustainable Cities* [online]. 2001 Edition. The Urban Agriculture Network, Inc, 2001. Available at: http://www.jacsmit.com/book.html.

TINKER, I. (1994). Urban Agriculture is already Feeding Cities. In: Egziabher, A.G., Lee-Smith, D., Memon, P.A., Mougeot, L.J.A., Sawio, C. *Cities Feeding People: an examination of urban agriculture in East Africa*. Ottawa, IDRC, pp. vii – xiv.

THE ECONOMIST (2001) Brighter Days in Copperbelt. *The Economist* [online] Jun 28th 2001. Available at: http://www.economist.com/node/676368.

UN-HABITAT (2012). *State of the World's Cities 2012/2013: Prosperity of Cities* [online]. UN-HABITAT 2012. Available at: http://www.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3387.

UNITED NATIONS (2014) List of Least Developed Countries [online]. Available at: http://www.un.org/en/development/desa/policy/cdp/ldc/ldc_list.pdf.

VAN DER HOEK, W.; ULHASAN, M.; ENSINK, J.; FEENSTRA, S.; RASHID-SALLY, L.; MUNIR, S.; ASLAM, R.; ALI, N.; HUSSAIN, R.; MATSUNO, Y. (2004). Urban Wastewater: A Valuable Resource for Agriculture. A Case Study from Haroonabad, Pakistan. *Research Report 63* [online]. International Water Management Institute. Available at: http://pdf.usaid.gov/pdf_docs/pnacr774.pdf.

VAN VEENHUIZEN, R. (2006). Cities Farming for the Future. In: van Veenhuizen, R. (ed.) *Cities Farming for the Future: Urban Agriculture for Green and Productive Cities* [online]. RUAF Foundation, IDRC and IIRR. Pp. 1 – 18. Available at: http://www.ruaf.org/publications/profitability-and-sustainability-urban-and-peri-urban-agriculture.

VAN VEENHUIZEN, R.; DANSO, G. (2007). *Profitability and Sustainability of Urban and Peri-urban Agriculture* [online]. FAO Rome, Italy 2007. Available at: http://www.ruaf.org/sites/default/files/Profitability%20and%20Sustainability.pdf.

VOLENIKOVA, L. (2012). *Zemědělství v rozvojových zemích – potenciály a ohrožení (Urban Agriculture in Developing Countries – potentials and risks)*. Bachelor thesis. Palacký University in Olomouc.

WILLS, J., CHINEMANA, F., RUDOLPH, M. (2009) Growing or Connecting? An Urban Food Gardens in Johannesburg. *Health Promotion International* [online], Vol. 25 No. 1. Available at: http://heapro.oxfordjournals.org/content/25/1/33.full.pdf+html.

WORLD BANK (1986) *Poverty and Hunger: Issues and Options for Food Security in Developing Countries* [online]. World Bank, Washington, DC, USA. Available at: http://documents.worldbank.org/curated/en/1986/07/440681/poverty-hunger-issues-options-food-security-developing-countries.

WORLD BANK (2014) *Zambia Overview* [online] [cit 3-5-2014] . Available at: http://www.worldbank.org/en/country/zambia/overview.

ZEZZA, A., TASCIOTTI, L. (2010). Urban Agriculture, Poverty, and Food Security: Empirical Evidence from a Sample of Developing Countries. *Food Policy*, Vol. 35, Issue 4, August 2010, pp. 265 – 273.