

**THE CONTRIBUTION OF URBAN AGRICULTURE TO SUSTAINABLE  
DEVELOPMENT: POTENTIAL ROLE IN IMPROVING FOOD SECURITY AND  
REDUCING POVERTY**

**by**

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## ABSTRACT

The current global environmental degradation, climate change as well as socio-economic changes and challenges that are reflected in various problems such as the ones associated with malnutrition and diseases have called for adequate and adapted measures to solve these unprecedented difficulties. This global burden is being driven mainly by increasing global urbanisation and the pursuit of economic growth and globalisation. Due to this dilemma, the developing world suffers most because it does not have the means and measures in place to combat uncertainties, let alone food insecurity, that are aggravated by conflicts, especially on the African continent.

The implication of expanding urbanisation is the increased reliance on buying instead of producing food, leading to various complications, such as deteriorating health, making it ultimately more difficult for governments to deal with. South Africa already has an unemployment rate of over 26%, with more than 60% of the population living in urban areas. Access to food is mostly through retail stores, which increases the burden on the urban poor, who are highly dependent on the prices of the food purchased, leading to the consequences of consuming affordable unhealthy food and increased food insecurity, such as stunted children in poor urban households.

While striving to achieve sustainability is increasingly gaining a place at the core of developmental strategies, finding solutions to problems related to global food insecurity is crucial and this is reflected in the first two United Nations (UN) goals of sustainable development. In the search for adequate alternative means to produce enough quality, accessible and affordable food, urban agriculture is gaining popularity as the most promising means. Urban agriculture, which can be defined as the production of food in and around cities, is being explored as one of the sources of supply in urban food systems. It is claimed to be the key to not only achieving the first three UN goals of sustainable development, especially in growing cities, but also one of the many options to make productive use of urban open spaces because it recovers and/or treats urban liquid and solid waste. Further, it is also claimed to generate employment, save income, and manage freshwater resources in an effective way.

Despite all of these claims, and increasing practices across the globe with adaptations and innovative means, this sector is still criticised for not producing enough empirical evidence.

The main aim of this research is to explore and discuss critically those aspects and current trends of urban agriculture in relation to food security and poverty alleviation among the urban poor as a step towards sustainable development. This discussion will help to raise awareness and distribute information about the crucial impact of urban agriculture in the provision of food, income and employment, further discussing the sustainability of this achievement as well as possible gaps and potential recommendations in this area. The information gathered will provide support to policymaking processes as well as the implementation of urban agriculture.

## OPSOMMING

Voldoende en aangepaste maatreëls word verlang om by te dra tot die oplossing van ongekende probleme soos wêreldwye omgewingsverwaarloosing, klimaatsverandering asook die gepaardgaande sosio-ekonomiese veranderinge en uitdagings, insluitend ondervoeding en siektes.

Hierdie wêreldwye las word aangedryf deur toenemende verstedeliking, die najaag van ekonomiese groei, en globalisering. In hierdie dilemma ly ontwikkelende lande die meeste omdat hulle nie oor die nodige vermoëns beskik en geskikte maatreëls het om uitdagings soos voedselonsekerheid, wat vererger word deur konflikte, veral in Afrika, die hoof te bied nie.

Die implikasie van toenemende verstedeliking is dat ál hoe meer staatgemaak word op die koop pleks van vervaardiging van voedsel, wat lei to verskeie komplikasies - soos mense se gesondheid wat agteruitgaan - en dit moeiliker maak vir regerings om aan te pak.

Suid-Afrika het reeds 'n werkloosheidskoers van 26%, met meer as 60% van die bevolking wat in stedelike gebiede woon. Die verkryging van kos vind hoofsaaklik plaas deur supermarkte, wat die las op stedelike armes verhoog omdat hulle baie afhanklik is van die kospryse wat betaal word. Dit het tot gevolg dat bekostigbare maar ongesonde kosse geëet word, asook toenemende voedselonsekerheid, met kinders in arme stedelike huishoudings wie se groei belemmer word.

Terwyl die strewe na volhoubaarheid toenemend 'n vername deel uitmaak van ontwikkelingsstrategieë, is dit belangrik om oplossings te vind vir die wêreldwye probleem van voedselonsekerheid, en dit word weerspieël in die eerste twee van die Verenigde Nasies (VN) se doelwitte vir volhoubare ontwikkeling.

In die soeke na nastreef en alternatiewe maniere om genoeg gehalte, bekostigbare en toeganklike voedsel te vervaardig, word stedelike landbou ál hoe gewilder. Stedelike landbou, wat gedefinieer kan word as die vervaardiging van kos in en om stede, word

nagevors as een van die voedselbronne in stedelike voedselstelsels. Daar word aangevoer dat dit nie net die oplossing is om die eerste drie van die VN se doelwitte vir volhoubare ontwikkeling te bereik nie, veral in groeiende stede, maar dat dit ook een van die vele opsies is om produktief gebruik te maak van ruimtes in stadsgebiede omdat dit bydra tot die behandeling van vloeibare en vaste stedelike afval. Navorsers voer ook aan dat dit werk skep, geld bespaar, en help om varswaterbronne doeltreffend te bestuur.

Ondanks al hierdie redes, en toenemende praktyke wêreldwyd met aanpassing en innovasies, lok die stedelike landbou sektor steeds kritiek uit omdat daar nie genoeg empiriese bewyse is dat dit wel resultate lewer nie.

Die hoofdoel van die navorsing is om daardie aspekte en neigings van stedelike landbou te verken en krities te bespreek sover dit voedselsekerheid en die verligting van armoede onder die stedelike armes betref, en hoe dit bydra tot volhoubare ontwikkeling. Hierdie bespreking sal help met bewusmaking en inligting wat na vore gebring word oor die uitwerking van stedelike landbou op die verskaffing van voedsel, inkomste en werk. Die volhoubaarheid hiervan sal ook bespreek word, asook die leemtes en aanbevelings gemaak word. Die inligting wat ingewin is sal goeie ondersteuning bied vir die bepaling en toepassing van beleidsrigtings, asook die praktyk van stedelike landbou.

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## **DEDICATION**

To my dear husband, Emmanuel Evariste Siborurema, and our beloved children, Euloge Sanctus Iradukunda Muhire Siborurema and Anèle Magnificat Iribagiza Siborurema

## **LIST OF ABBREVIATIONS**

EU- European Union

HSRC - Human Sciences Research Council

INS- Integrated Nutrition Strategy

NGO - Non-Governmental Organisation

SSA- Statistics South Africa

SDG - Sustainable Development Goals

UK- United Kingdom

UN - United Nations

UNDP - United Nations Development Programme

USA - United States of America

# CHAPTER ONE: THE CONTRIBUTION OF URBAN AGRICULTURE TO SUSTAINABLE DEVELOPMENT: POTENTIAL ROLE OF URBAN AGRICULTURE TO IMPROVING FOOD SECURITY AND REDUCING POVERTY

## 1.1 INTRODUCTION

Amid current global environmental changes and socio-economic challenges, the ultimate aim for all countries is to achieve sustainability. The latter is the key to our liveable future. There is a presumption that most of the world's population will be based in cities in the future (Ingram *et al.*, 2010; United Nations (UN), 2013; Crush *et al.*, 2012). On the African continent, and Sub-Sahara in particular, urbanisation is fast on the rise and this goes hand in hand with urban poverty in this region where these areas are dominated by slums. For example, according to Battersby (2011: 1), urbanisation in South Africa has reached more than 60% and the expectation of this growth by mid-century is about 80%. Bearing this in mind, it becomes necessary to seek alternative means to feed the growing urban population. This, in turn, will help to sustain our growing cities amid global trends in pursuit of sustainability.

With growing urbanisation driven mainly by rural-urban migration worldwide, the search for a means that could help to resource and protect our cities from environmental shocks is crucial. Regarding the resourcing of cities, an area being explored is urban agriculture, defined as the production of food in and around cities. For a liveable future, sustainability becomes a key factor. To make this possible, we have to prioritise ways of achieving the United Nations' Sustainable Development Goals (SDGs) <sup>1</sup>. Among them, the first three relate to food security and poverty alleviation.

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<sup>1</sup>The first three SDGs are:

SDG1: End poverty in all its forms everywhere

SDG 2: End hunger, achieve food security and improve nutrition and promote sustainable agriculture

SDG3: Ensure healthy lives and promote well-being for all at all ages. Available at:

<https://sustainabledevelopment.un.org/post2015/summit>

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It has been estimated that 800 million people are engaged in urban agriculture worldwide (Smit *et al.*, 1996b in Mougeot, 2005: 20). Of these, some 200 million market producers are employing 150 million people full-time (Mougeot, 2005: 20). It has also been asserted that nearly 25 million of the 65 million people living in the urban areas of some African countries, such as Uganda, Ethiopia, Eritrea, Tanzania, Kenya and Zambia, obtain some of their food from urban agriculture. It is estimated that by 2020 at least 35 to 40 million urban residents will depend on urban agriculture to feed themselves (Denninger *et al.*, 1998 in Mougeot, 2005: 20).

Urban agriculture, one of the sources of supply in urban food systems, is said to be the key to achieving the first three goals of sustainable development, especially in growing cities. Hence, it should be further researched, explored and possibly given the credit it deserves in promoting the achievement of these goals. Urban agriculture is said to provide an option to use urban spaces productively because it recovers and/or treats urban (organic) solid and liquid waste. Moreover, it generates employment, helps save income and manages freshwater resources effectively.

Authorities worldwide, including those in South Africa, and the Western Cape Department of Agriculture in particular, have taken measures to advocate and support household and community gardening projects. These measures are not only driven by increasing food insecurity in the cities, but they are also about promoting access to sufficient, affordable and healthy food, as stated by Battersby (2011) and Irin (2014: 2) with regard to the Western Cape. Urban agriculture also reaches beyond the scope of merely growing food as it has a significant community development component, where it serves to act as a '*change agent*'.

There are different findings and claims (Battersby, 2011; Stewart *et al.*, 2013; Mougeot, 2005; Kinver, 2014) of urban agriculture's role in food security and reduction of poverty. However, researchers such as Battersby *et al.* (2015) have argued that the lack of sufficient data, especially in South Africa, makes it impossible to justify and support urban agriculture's role in the fulfilment of urban nutritional needs and values. Therefore, this research intends to explore and discuss critically the aspects and current trends of urban agriculture in relation to food security and poverty alleviation, specifically among the urban poor, as a step towards sustainable development. This study uses a variety of case studies

from different cities worldwide as well as South African case studies to identify the presence and the trends of urban agriculture.

This global perspective of urban agriculture allows the study to analyse and discuss critically the dilemma surrounding global urbanisation, rising urban poverty and food insecurity claims amidst climate change challenges. The aim of the study is to help raise awareness and distribute information about the crucial impact of urban agriculture regarding the provision of food, income and employment. Moreover, the research seeks to identify the sustainability of urban agricultural practices and highlight information gathered from successful cases, as they could serve to inform policies and strategic planning where gaps and challenges exist.

## **1.2 MOTIVATION OF THE STUDY**

Battersby *et al.* (2015) state that challenges encountered in food security are under-acknowledged in South Africa. For example, they argue that in most of the ‘metros’ the use of urban agriculture is generally below 10%. Worldwide different research projects have been, and continue to be, conducted on urban agriculture. However, the lack of sufficient data makes it impossible to justify and support urban agriculture’s role in food security provision. Similarly, little is known about the lack, or low level, of participation in urban agriculture by the supposedly vulnerable households in South African cities (Battersby *et al.*, 2015: 1).

Different reasons underlie the search to identify and discuss critically the current trends in urban agriculture. These include different claims about the role of urban agriculture in urban food systems (Battersby, 2011; Stewart *et al.*, 2013; Mougeot, 2005; Kinver, 2014) and growing urbanisation worldwide (UN, 2013; Crush *et al.*, 2012). In addition, this search is based on alarming current trends related to food insecurity in South Africa as Fukuda-Parr and Taylor (2015) have pointed out; also, the accelerating food prices as well as the high unemployment in the country.

Moreover, this study seeks to identify the gaps in the research conducted. The researcher endeavoured to identify and possibly confirm the role of urban agriculture in contributing to food security and poverty alleviation among the urban poor. Also, the study seeks to find the reasons for the lack of or limited participation in urban agriculture by the vulnerable urban

poor who could otherwise benefit from and achieve sustainable means that are crucial steps towards a viable future.

### **1.3 LITERATURE REVIEW**

#### **1.3.1 Background**

As Fukuda-Parr and Taylor (2015: 11) have pointed out, there has been a decrease in subsistence agriculture for decades in South Africa. The authors claim that, although this reduction in production may not be a hunger driver on a national scale, it would make a huge difference if those who are at risk of food insecurity could engage in food production, whether to consume or generate income. The difference could be found in increased quantity and reliability of consumption, increased income and/or nutritional qualities. In relation to food security in the country, remarkable differences are found in population groups and their location. Regarding to food insecurity, whether in urban or rural areas, particular attention is given to informal settlements. In a report following a survey by SANHANES-1 (Human Sciences Research Council (HSRC), 2014 in Fukuda-Parr and Taylor, 2015: 79), it was found that those who experienced hunger in urban informal settlements stood at 32.4%, and 36.1% were at risk of hunger. Comparatively, in rural informal settlements the report found that 37% were experiencing hunger while 32.8% were at risk of hunger.

Assuming that most of the world's population will be based in cities in the coming years (Ingram *et al.*, 2010; UN, 2013; Crush *et al.*, 2012), it makes sense to identify ways to equip our cities with the means to deal with the demands of their populations, and this includes assuring food security. According to Crush *et al.* (2012: 272), South Africa's urbanisation rate is expected to be over 70% by 2030, and Battersby (2011: 1) states that it is expected that the rate of urbanisation in South Africa would have increased to 80% by mid-century. The latter author argues that in Cape Town alone, between 2001 and 2007, the population growth was just one point three percent (1.3%) while the migration rate is 41% of the City's annual population growth.

While there is great cause to achieve sustainability by aligning with sustainable development goals such as assurance of food security and eradication of poverty (United Nations Development Programme (UNDP), 2015: 15), urbanisation is increasingly becoming a huge

challenge worldwide for various reasons, posing more hindrances to achieve sustainable development.

In relation to climate change and the increase in energy and food prices, changes in behaviour and adaptation in lifestyles are necessary to achieve sustainability. Without these changes, even the cleanest technology, or research projects containing the most outstanding recommendations, would not succeed in directing societies towards the longed for sustainable world.

The current ever increasing global urbanisation requires the exploration of alternative means by which our cities would be resourced. Development should be sustainable and this suggests attending to the needs of all three dimensions of sustainable development, namely social, economic and environmental. The achievement of sustainable development goals, including food security and poverty alleviation, could lead to empowering people and helping them to overcome the ‘*deprivation trap*’. Swanepoel and De Beer (2006: 31) put it this way: "*The real goal of development is to eradicate poverty, not to address poverty or deal with some of the manifestations of poverty. Put in another way, development wants to free people from the deprivation trap... We are therefore talking about a vicious attack on the current situation in order to bring radical change*".

Regarded as one of the sources of supply in urban food systems and one of the means to achieve the sustainable development goals in this era of urbanisation, urban agriculture has the potential to become one way to free the urban poor from the deprivation trap if it is implemented well.

### **1.3.2 Sustainable development in low-income countries**

Different studies show consensus on the need for sustainable development. Sustainability has to be placed at the core of development. However, the UN (2013: 8) Report states that although there has been an increase in efforts made worldwide to integrate the three dimensions of sustainable development (economic, social and environmental), much more still needs to be done to adequately achieve sustainable development. It has been posited that so far no country has managed to achieve this goal, as explained in the following statement: “For twenty years, the international community has aspired to integrate the social, economic,

and environmental dimensions of sustainability, but no country has yet achieved this. We must act now to halt the alarming pace of climate change and environmental degradation, which pose unprecedented threats to humanity” (UN, 2013: 8).

### **1.3.3 Thoughts on urban agriculture**

#### ***1.3.3.1 Definition of urban agriculture***

Urban agriculture, due to its various systems and characteristics depending on local geographic, socio-economic and political conditions, is not easily defined. Mougeot, 2005 in (Stewart *et al.*, 2013: 7) defines urban agriculture<sup>2</sup> as “an industry that is located within (intra-urban), or on the fringe (peri-urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re)using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area”.

#### ***1.3.3.2 Types of urban agriculture***

With the technological advances, local adaptations amid climate change, population growth, as well as environmental degradation, there are ongoing inventions and initiatives in urban agriculture that are designed to meet the needs of the people concerned. In the Western Cape four main types of gardens are found, namely individual, school, community and smaller food gardens such as those linked to clinics, as has been pointed out by Krige (2017). The list below provides some of the general types of urban agriculture which are being explored worldwide:

- Micro farming in and around the house: This could include all types of gardening such as roof gardening, container gardening, raised gardening, raised bed, traditional, and so on.
- Community gardens: These comprise plots of land that are used for growing food. These plots are located away from where the farmer lives.
- Institutional gardens: They include schools, churches, prisons and any other institutions that grow food.

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<sup>2</sup> This definition of urban agriculture was developed by the same author the first time in the year 2000 (Mougeot, 2000: 11).

- Small-scale commercial farms: They include horticultural-based farms (growing plant-based products); small-scale commercial livestock and fish-farming (chickens, goats, bees, tilapia, and so on); small-scale specialist producers (specific products such as mushrooms, and so on).
- Large-scale agro-business: The well-known agricultural activities that bring large amounts of food to dense urban populations.
- Multi-functional farms: Here you may find a mixture of different types of crops and products in one plot/place (flowers, vegetables, fruits, and so on).

This research evaluates these different farming activities in various cities around the globe.

### ***1.3.3.3 Benefits of urban agriculture***

Being one of the sources of supply to urban food systems, urban agriculture is one of the means to make productive use of urban open spaces, for example, backyards. Urban agriculture is also used in recovering and/or treating urban liquid and solid waste, and ultimately it contributes to the creation of employment, generation of income, and the management of freshwater resources.

Managed properly, urban agriculture can contribute to food security in at least three ways:

*Firstly*, the quantity of food available will increase. Poor urban dwellers often lack the means to buy adequate amounts of food. Urban agriculture would reduce food insecurity by providing direct access to home-produced food to households and to the informal market.

*Secondly*, urban agriculture enhances the freshness of perishable foods reaching urban consumers, and so increasing the overall variety and nutritional value of the food available.

*Thirdly*, urban agriculture can offer opportunities for productive employment in a sector where there are low entry barriers.

In short, through its link to sustainable development goals, urban agriculture contributes to sustainability in different ways. Various researchers such as Egal et al. (2001), Moreno-Penaranda (2011), Stewart et al. (2013) and Olsson et al. (2016) have discussed this contribution as follows:

- On the one hand, adopting urban agriculture, as an alternative means to produce food, has shown to be not only one of the effective measures targeting food security assurance, but also a means by which to facilitate the restoration of the degraded environment as a result, for example, of increased amounts of pesticides being used and soil erosion.
- On the other hand, the production of own food does not simply contribute to a mere availability of fresh and quality food in local neighbourhoods, but rather contributes to the development of resilient communities through capacity building in different ways (provision of income, ownership, inclusiveness, good health, and so on). It is this contribution by urban agriculture to the development of resilient communities that this study intends to highlight, particularly in relation to food security, poverty alleviation, and capacity building.

If one reflects on all the factors that have to be considered in making a city sustainable, promoting urban agriculture makes good sense, instead of simply having sophisticated-looking green areas.

However, while some types of urban farming can help make cities more sustainable, one cannot rule out the possibility that urban agriculture may produce harmful effects in the city and its inhabitants if implemented poorly. An example of this could be the production of lower quality food by using polluted and untreated water, or polluted soil.

#### ***1.3.3.4 Benefits of urban farming compared to traditional farming***

Urban farming has become a world-wide trend during the past few years, since at least 1990s (Componioni *et al.*, 2002: 221), and it keeps developing as new designs and plans unfold. This type of agriculture is claimed to be the future of food production, especially in cities. Subsequently, new gardening methods are appearing fairly rapidly. What could be the reason that urban farming seems irresistible and supposedly superior to the traditional way of farming in this period of urbanisation? LAN (2015) points out that urban agriculture is:

- More productive: By means of urban farming, it is possible to produce “even so much as 100 times” more food than with regular farming (per square foot). One of the

reasons for this claim by LAN (2015: 1) is that most urban farms are designed vertically, which allows production on many levels on a square foot. "...you can simply have a tasteful-looking urban farming system with lettuce growing on shelves or behind your walls!"

- More sustainable: There are various claims that most urban gardening systems lead to saving of significant quantities of water, space and power compared to traditional farming. There are claims that an urban farm may be costly. Moreover, it is not only about the saving of water, power and space, but also about the increased demand in food production that leads to more soil erosion, droughts, and similar problems; hence the incorporation of urban agriculture would help to solve these problems.
- Promotes the accessibility of organic produce: With urban farming there are possibilities to grow organic food without additional investment. There is a tendency to use chemical pesticides to ensure a good harvest when the environmental factors are not crop-friendly, but with urban farming the weather conditions and other environmental factors are reduced to a minimum. There is almost no need to use chemicals.
- Suitable for small spaces: Urban farms, which include home or indoor farming, make it possible to use small spaces, for example in backyards, containers, vertical gardening against walls, and even shelves.
- Promotes the possibility to enjoy fresh produce all year round: In urban farming it is possible, due to the reduced environmental and seasonal factors to harvest anything at any time.
- Simple: With urban farming procedures, coupled with technological advances, one is able to grow fresh food for self-sufficiency all-year-round (Click and Grow, 2016). Some of these claims will be assessed in this study.

## **1.4 RESEARCH PROBLEM AND OBJECTIVES**

### **1.4.1 Research problem**

The research question in this study is not simply based on the literature's arguments, but also on the researcher's daily experiences and observations in the community in which she resides. In the literature review, the arguments state that failing to address basic needs such as poverty alleviation, has placed a huge strain on addressing social-economic, as well as

environmental problems. It has also been argued that urban agriculture is being used as one of the alternative means to address sustainability issues. Based on all the aforementioned elements, the researcher wishes to identify the potential role that urban agriculture can play in contributing to food security and alleviation of poverty in urban areas, specifically among poor urban households. The research seeks to answer the following question:

- What is the potential and actual role of urban agriculture in improving food security and reducing poverty within urban poor households?

Addressing this question involves the following related questions that this research aims to explore:

- What is urban agriculture?
- Who participates in urban agriculture and why?
- How is urban agriculture linked to sustainable development?
- How is urban agriculture helping to reduce the incidence of poverty in urban poor households in low and middle income countries?
- What is the link between urban agriculture and environmental management?
- What are the trends of urban agriculture in South Africa as a whole, and in Cape Town specifically?

#### **1.4.2 Research objectives**

In terms of general objectives, this research aims to address the gap in knowledge about urban agriculture, especially in under and developing countries such as South Africa, and Cape Town in particular. It seeks to provide evidence for interested and concerned entities such as policy makers, practitioners, activists, institutions and members of the international community on the costs and benefits of urban agriculture for the urban poor, its feasibility, as well as address any current gaps in this sector.

##### **The specific objectives include:**

- assessment of how urban agriculture is incorporated into urban sustainability measures in South Africa;
- assessment of how urban agriculture is able to address food security and reduce the incidence of poverty among poor urban households;
- assessment of how urban agriculture is conceived by the urban working class/poor in the Cape Town area.

## 1.5 RESEARCH DESIGN AND METHODOLOGY

This research uses a qualitative methods approach. Non-empirical studies that are employed are mainly based on literature reviews. However, in the search for objectivity and consistency, complementary individual face-to-face interviews are also used in this study.

The choice of such interviews is based on the search for:

- accurate and relevant information from participants by means of their own point of view and experiences in ‘*real-life situations*’ in order to cover possible gaps in findings and
- description and explanation of urban agriculture trends in studied areas to ultimately compare findings (Brynard & Hanekom, 2006: 37). Interviews were conducted in Cape Town. Trends in, as well as personal views on, urban agriculture were assessed, described and evaluated in order to provide adequate answers and other necessary information needed to address the research problem, questions and objectives (Mouton, 2001: 158-180).

### 1.5.1 Methodology

Due to the fact that this research uses secondary data, the researcher chooses and collects cases from different countries in the already existing data (preliminarily researched by other authors) to gather detailed and enriched information on the trends of urban agriculture. The techniques for data collection used are according to Brynard and Hanekom (2006: 38). These include a critical literature review and open ended interviews. The literature study includes former research findings, reports, journals, books, other case studies (referred to in the literature, and so on). Photographs and videos are also used in this research. The researcher intended to use any possible evidence from which one could learn. However, the researcher pays attention to detail in order to avoid potential bias.

## 1.6 SCOPE OF THE STUDY

The geographical scope of the study is global – two representative cases from North America; two from Latin America; four from Asia and seven from Africa, including South Africa.

- The case studies have been chosen based on:
  - the connection they have with and the presence of involvement in urban agricultural practices; and

- the potential impacts drawn from each of the cases' activities with regard to the provision of food security and alleviation of poverty.

## **1.7 RESEARCH ETHICS**

Ethical considerations are according to Mouton (2001: 238-246). The author states that considerations should be made with regard to the obligations of the researcher, as well as the rights of research subjects in case of interviews. Examples of these relate to issues of privacy, to guarantee the confidentiality of the information divulged, anonymity, consideration of vulnerability and possible harm, and so on, and these have been taken into account. Possible sensitive information is addressed in an appropriate manner. This research involves human beings as research subjects. Hence, having the necessary permission(s) needed to conduct research in certain areas, is a must and for this the researcher went via the Stellenbosch University Ethical clearance process before taking on interviews in the field research. The data collected were treated with the utmost care and attention.

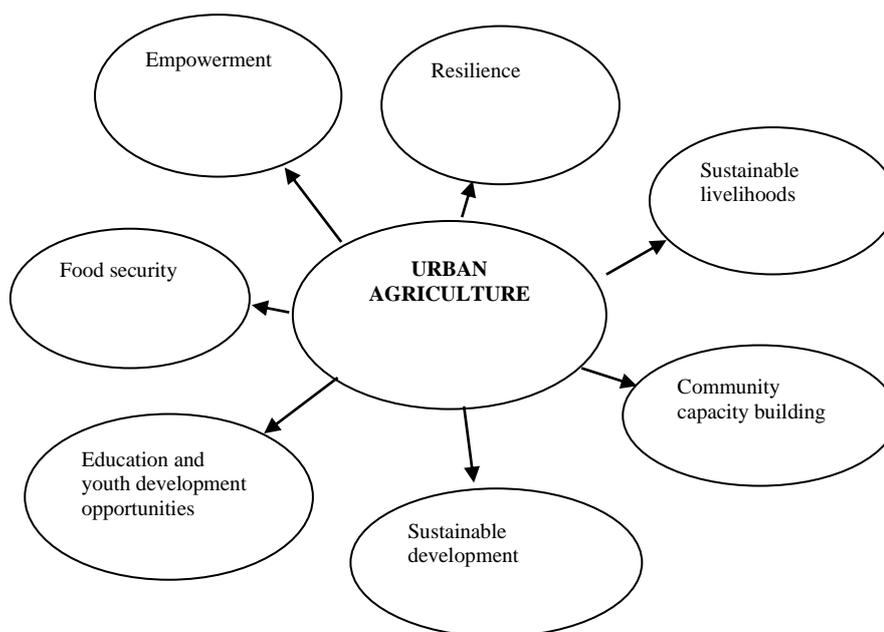
## **1.8 LIMITATIONS OF THE STUDY**

Various methods are applied to conduct research, and each of them has its strengths and limitations. In general, the limitations of this research are based on the fact that it is a qualitative, secondary data study, and are related to the fact that data being used have been gathered by others in different contexts with different intentions and purposes. Additionally, critics of the use of case studies have pointed out that researchers may not be able to generalise data to a larger population. Then, there are also limitations associated with the use of interviews, as the use of face-to-face interviews can lead to biased information. The researcher carefully considered these issues and planned accordingly.

## **1.9 KEY CONCEPTS**

- Food security: Food security can be defined as a “situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meet their dietary needs and food preferences for an active and healthy life” (World Food Summit 1996 in Ericksen, 2008: 234).

- Education and youth development opportunities: This refers to allowing youth to learn and/or broaden their knowledge, abilities and skills that can be used in new situations.
- Resilience: In terms of sustainability, resilience refers to “how a system copes with major perturbations to its operating environment” (Handmer & Dovers in Daniel, 2011: 31).
- Community capacity building: A way of providing community members with means to develop capabilities that would help them to care for their own needs.
- Empowerment: Communities are empowered when they are enabled, afforded opportunities to own and control their own lives and are able to explore their own rights.
- Sustainable livelihoods: In relation to sustainable development, this is possible if community members are able to use their capabilities and assets as a means of earning a living, and these means are maintained while people cope with and recover from shocks and stresses encountered in daily life (Krantz, 2001: 6).
- Sustainable development: “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development (WCED), 1987).



**Figure 1.1: The mind map showing the key concepts**

**Source: Author (2017)**

## **1.10 OUTLINE OF THE CHAPTERS**

*Chapter one* covers the introduction to the study, integrating the introduction of the study proposal, the motivation thereof, preliminary literature reviews (where some thoughts on urban agriculture are shared), the research problem and objectives as well as limitations of the study. This chapter includes research design and methodology, and key words presented in a mind map.

*Chapter two* of the study is centred on the literature review. An overview of urban agriculture and its links to sustainable development will be covered. The main focus in this chapter will be defining urban agriculture, its global trends, the key drivers of its practice and its link to environmental management.

*Chapter three* covers the trends of urban agriculture in South Africa, focussing on its practices in relation to urban agricultural policy. This chapter also provides complementary interviews conducted with individuals (farmers and key informants) to obtain personal experiences.

*Chapter four* covers the methodology used in conducting this study.

*Chapter five* concentrates on the presentation and discussion of the results of the study. An overview of urban agriculture trends worldwide and what this has in store for the urban poor will be provided.

*Chapter six* covers the concluding remarks and recommendations in relation to the research findings.

## **CHAPTER TWO: OVERVIEW OF URBAN AGRICULTURE: A LITERATURE REVIEW**

### **2.1 INTRODUCTION**

In the previous chapter, the research problem was introduced. Mention was also made of the fact that there is a worldwide increase in urbanisation and a growing urban population. The two are key elements together with other characteristics of the Twenty-first Century. Driven mainly by migration from rural to urban areas due to socio-economic challenges caused by environmental changes, for example drought in rural areas, this increasing urban growth is gradually imposing a new demand on how city planners, policy makers and implementers need to direct their attention to ensure urban sustainability (Parnell & Walawege, 2011: 12-20). Today's city managers are experiencing challenges caused by rising urbanisation, but this is happening against the background of climate change, resulting in human displacement and migration.

In Africa, particularly in the Sub-Saharan region, urbanisation is on the rise and so are unemployment, poverty, food insecurity, hunger, poor health, crime and corruption. As more people move to cities in search of greener pastures, the more pronounced urban poverty becomes; the more the number of newly established slums, the more deteriorated their socio-economic conditions. Matters are exacerbated because their health becomes poorer. As a country's economy declines, it makes way for socio-economic challenges and conflicts. Ultimately, the result is an increase in rural to urban, urban to urban, and/or country-to-country migration, and so the cycle is repeated. Another factor to take into account is the importation of food, especially in Africa, which brings its own challenges as more processed foods are being found to place a huge strain on people's health. Poor urban dwellers who rely only on purchased food, suffer a double ordeal (Nwuneli, 2018: 1-4).

Based on the argument above, it is necessary to find ways to resource and keep our cities safe from socio-economic and environmental setbacks. This is linked to how cities obtain and use resources. In the search to ensure food security, urban agriculture is one of the areas being explored to feed growing populations in urban areas. Claimed to be the key to achieving the first three goals of sustainable development, especially in growing cities, urban agriculture is

one of the sources of supply to urban food systems. As this is a growing phenomenon worldwide, and marked by increasing innovation, it should be further researched and explored to gain a better understanding.

The purpose of this chapter is to review the trends of urban agricultural practices worldwide and their impacts and links to sustainable development. To be able to understand these patterns of urban agriculture and raise awareness about the crucial impact it has on people's livelihoods, especially the urban poor, cases from selected countries will be considered. The cases included will be from developed, developing and underdeveloped countries of the past decade to be able to draw well-founded and comparison-based conclusions. The information gathered will provide support for the making and implementation of policies related to urban agriculture.

## **2.2 OVERVIEW OF URBAN AGRICULTURE**

### **2.2.1 Urban agriculture: Definition**

Urban agriculture is viewed by different researchers and entities (Korth *et al.*, 2014: 2; RUAF Foundation, 2008: 2) as a rather complex concept. This is due to different systems in which urban agriculture is practised and, in turn, these different systems around the globe produce different characteristics of urban agriculture. As it is stated by Korth *et al.* (2014), the current widely used definition of urban agriculture has been developed by Mougeot (2000). The definition is as follows: “*Urban agriculture is an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re-) using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services to that urban area*” (Mougeot, 2000: 11; Korth *et al.*, 2014: 2).

### **2.2.2 Urban agriculture: A closer look at the history**

Urban agriculture is not new. It is said that food gardens for crop production were already included in urban landscapes many years ago with the aim of ‘defending’ cities, preventing food shortages, as well as generating resilience amidst difficult times such as droughts (Ellis & Sumberg, 1998: 214; Ikerd, 2017: 14; Korth *et al.*, 2014: 2). In countries such as Cuba,

urban agriculture has been used as a means to overcome food shortages very successfully. As Orsini *et al.* (2013: 5) argue, agriculture and related activities have for some time been associated with rural environments, where relying upon crop production in only rural areas to feed urban populations was then the only consideration.

As challenges such as lack of adequate infrastructure and the means to facilitate the transportation, marketing and purchase of produce, especially in under-developed and developing countries were encountered, growing unemployment, increased poverty and the growth of urbanisation were brought to light. This stimulated the search for alternative production means to accommodate the ever-changing demands of cities, especially food demands. It is through this development of farming activities, including food production, within urban and peri-urban areas that the term “urban agriculture” came into existence (Orsini *et al.*, 2013: 5). Stewart *et al.* (2013) argue that urban agriculture has been around as a livelihood strategy for as long as humans have settled in urban areas, but this sector only started to gain proper attention in the early 1990s.

### **2.2.3 Urban agriculture: Different views and perspectives**

The different views on, understandings of and practices of urban agriculture nowadays yield even more interest in this growing sector. The practice and effects of urban agriculture around the world are differentiated by various factors such as means of production, purpose of practice, different levels of the development of countries, technology, and the role of government.

Stewart *et al.* (2013) state that although it is being advocated by an increasing number of scholars and gaining important labels such as “*Agropolis*”, “*hunger-proof cities*” and “*Cities feeding people*” in terms of its crucial role in tackling the burden of urban hunger and poverty, weak empirical evidence makes it difficult for these claims to be substantiated.

The significant gap between the practice itself and lack of accessibility to technical assistance, information, empirical data, as well as proper implementation by city managers, makes it impossible for urban farmers to achieve success, specifically in low- and middle-income countries. Had this sector received the proper attention it deserved in some countries, it would have gone a long way in alleviating poverty and food insecurity which ravage some countries (Ikerd, 2017: 13-15).

Despite the claimed lack of clear evidence regarding its role in eradicating urban poverty, scholars and policy makers in different parts of the world today are showing interest in urban agriculture as a promising solution to urban food insecurity. For example, Korth *et al.* (2014:2) point out that the City of Johannesburg, in its '*Growth and Development Strategy 2040*', has identified urban agriculture as the city's main intervention in addressing the city's food insecurity issues. Moreover, Korth *et al.* (2014: 2) state that the '*United Nations High Level Task Force on the Global Food Crisis*' identified urban agriculture as a strategy designed to tackle urban food insecurity while at the same time build resilient cities.

#### **2.2.4 The need for urban agriculture**

The world finds itself with the dilemma of growing urban populations amid environmental challenges, a major problem especially in low- and middle-income countries where increasing urbanisation places more pressure on the managements of already struggling cities. Current pressures drive the search for the means to overcome them. Amidst this drive, food security and poverty alleviation within urban and peri-urban areas are being paid increasing attention. The steady growth of cities around the world does not come without setbacks. In low-and middle-income countries, the type of urbanisation found is characterised by large slums occupied by the poorest of the poor in urban areas (ActionAid International, 2016: 6-9; Swilling, 2016).

The socio-economic and environmental challenges encountered by the urban poor are not only diverse, but also difficult to manage by the managers of urban areas as more and more expansion, usually illegally, takes place. Some of the problems associated with growing urban population relate to food insecurity and extreme poverty in poor urban households. Different measures are being taken globally to enhance food security and alleviate poverty. Among these there is urban agriculture, which is considered as having the potential to make a difference (Iaquinta & Drescher, 2002: 984-991; Korth *et al.*, 2014: 3; Ncube & Ncube, 2016: 773; Gondo *et al.*, 2017: 53-54).

Half of the world's inhabitants reside in urban areas, and it is estimated that by 2030 this number will reach five billion (Dugger, 2007: 1). Keeping these figures in mind, one could well imagine the impact associated with such urban population growth. In Sub-Saharan

African countries, the evidence of rapid growth of populations is noted in cities (Parnell & Walawege, 2011: 12).

Growing urbanisation is taking place amidst the most challenging global issues, such as climate change and its consequences. Climate change issues incite the reflection on drought and other unprecedented environmental effects, as well as the consequences related to food insecurity, poverty and various public health problems such as malnutrition and related diseases. Urban agriculture would be able to contribute greatly in combating food insecurity, poverty and health issues in poor urban households. Also, it is believed to generate solutions to deal with problems such as drought.

Sustainability is key to promote a liveable future and this can be achieved by prioritising ways of achieving the SDGs, among them the first three goals related to food insecurity and poverty alleviation as it has been fore mentioned in this study. Stewart *et al.* (2013) also argue that due to increasing urbanisation and ever-rising food prices, urban agriculture is proposed as a solution to the urban food crisis, with the sector gradually finding its niche since the late 2000s. On the one hand, urban dwellers depend on purchased food, where the accessibility and affordability of these is crucial. Increased urbanisation contributes to a high level of urban poverty, partly due to exorbitant food prices, creating more difficulties for the urban poor to have regular access to affordable food supplied through the formal food supply systems. Urban agriculture, together with street vendors, has contributed to the remarkable informal food supply system that is making a large contribution to help satisfy the food demand of the urban poor (Stewart *et al.*, 2013: 2-3).

As Ikerd (2017: 15) points out, apart from the increasing demand in urban food supply, there is also the failure of agricultural industrialisation. This failure, together with the rejection of industrial agri-food systems, has brought agriculture to the urban areas where local organic farming is gaining popularity. This forms not only part of the search to respond to urban food supply, but also a sustainable food production system that is offering the solution needed to ensure urban food security.

### **2.3 CURRENT GLOBAL TRENDS IN URBAN AGRICULTURE: CASES FROM OUTSIDE AND INSIDE AFRICA**

The practice of urban agriculture varies from country to country. Depending on location, the areas of activity in urban agriculture may differ remarkably with regard to levels of education and financial position of citizens and farmers, the economy, social development needs of the country/local practice area, as well as government policies. With regard to urban agriculture, whether in developing or developed countries, it contributes to food security for urban poor families (Duchemin *et al.*, 2008: 43). Despite criticism about the lack of empirical evidence on the benefits of urban agriculture in relation to increased nutritional value and income generation (Korth *et al.*, 2014: 2-3), the movement is continually growing in many countries (Madaleno, 2000: 74-77; Walsh, 2017; Agarwal & Sinha, 2017: 236-241; Peng *et al.*, 2015: 344-345; Van Veenhuizen, 2006: 5-6).

Urban farming initiatives, although not all at the same level of development, are found in both developed and developing countries. In countries such as Cuba and Uganda, claims regarding the important contribution of urban agriculture to generating income, combating urban poverty and food insecurity among poor urban dwellers, seem to have gained the attention of not only urban farmers, but also city planners and government managers (Onyango *et al.*, 2017: 231-241). There is an increasing global interest in urban agriculture (both research-based and in practice), thus indicating the potential of urban agriculture as a means to an end amidst the global exacerbating urbanisation era (Jaquinta & Drescher, 2002: 2-8)

Although there are claims that many people participate in urban agriculture around the globe, it is also argued that this is still at a low rate compared to the needs of an increasing global urban population, especially with regard to food insecurity. Most urban farmers are found within urban community projects driven mainly by Non-Governmental Organisations (NGOs). In other instances, farmers claim open and unused spaces in cities, usually by illegal means, using these spaces for farming, especially for growing vegetables.

In African countries, particularly those in Sub-Saharan, the uptake of urban agriculture is still at a low rate despite having been practised for decades. As it will be more elaborated on in the following chapters, the progress of this sector is hampered above all by unfavourable policies amid the ever-increasing urbanisation, slums, ongoing conflicts and climate change

issues, but also by the poor management of cities, a lack of information and neglect or lack of technical support from government officials (ClimDev-Africa, 2013: 1-3; Parnell & Walawege, 2011: 12-20).

### **2.3.1 Urban agriculture outside Africa: North America, Europe, Latin America, the Caribbean and Asia**

Urban agriculture is flourishing around the world, including in developed countries. Although it is becoming a sought-after research topic, Duchemin *et al.* (2008) argue that there is a slight difference in the practice of urban agriculture in these countries, compared to the practices in Africa.

The urban farmers in developed countries, as in developing countries, tend to be made up of people from all lifestyles. The difference lies in access to the means of production and information, and is usually education-based, which tend to dominate the practices in higher-income countries as food production there tends to be high-tech and commercially oriented compared to conventional subsistence-oriented practices that dominate urban agriculture in Africa (Duchemin *et al.*, 2008: 48).

Overall, the urban agriculture sector, whether as a simple hobby, an income generating opportunity, or as a means of self-reliance is a practice that is slowly gaining respect in terms of informal food production and income generation despite the challenges.

#### **2.3.1.1 Urban agriculture in North America**

Whereas the urban agriculture movement is still having to contend with a number of challenges in relation to its recognition and government policies, North America has made remarkable progress in recognising and regulating urban agriculture as a part of urban ecosystems. Compared to urban agriculture in developing countries, this practice in developed countries is still at an initial phase, but has more prominent educational and socialisation features than is the case in developing countries (Duchemin *et al.*, 2008: 49).

Smit *et al.* (2001b) have argued that although urban agriculture in North America looks as if it is still in its initial phase, this practice is not new. The practice of urban farming goes back to the era of European immigrants who wanted to take their farming traditions into their new

settlements, but this connected-to-nature living style was soon abolished because of industrialisation and market-oriented farming.

When the crisis (recession) of 1882 negatively affected the regional economy, residents with vacant plots and empty properties had no other choice but to let these unused properties be used for urban agricultural activities again (Smit *et al.*, 2001b: 22). It was then that more charity and community gardening developed, and more adventurous people entered this sector with specialised farming groups. In these countries, urban agriculture has failed and reappeared over time, but in recent decades, it has gained more attention as a sustainable development tool. In Canada and the United States of America (USA), urban agriculture is recognised as one of the major contributors to local socio-economic and environmental developments in both Canada and the USA.

There are outstanding examples found in Canada and the USA where professional planners and academics have worked together to incorporate a well-planned urban agricultural system into the ecosystems of their cities. This can be explained by the fact that these parties have finally acknowledged the importance of urban agriculture in their urban areas (Soderholm, 2015: 1-2; Smit *et al.*, 2001b: 21-24).

#### *2.3.1.1.1 The case of Canada*

Considered a leading country supporting the urban agricultural movement, urban agricultural practices in Canadian cities such as Montréal, Vancouver, Ontario and Toronto are flourishing. In this country, this sector is more oriented towards conservation, education and recreation than to food security, although some community gardens provide emergency kitchens for poor urban people (Smit *et al.*, 2001b: 22-23). Although this is a growing practice, most of the projects are still community gardens compared to the ones in Asian cities, for example.

Although Toronto, home of one of the food councils in North America, appears to be taking a new direction with more rooftop gardening projects, the example chosen from Canadian urban farming for this study is Montréal.

Some of the gardens found in Montréal are known as either collective or community gardens. Montréal is the most prominent community urban gardening city in North America (Smit *et al.*, 2001b: 22; Duchemin *et al.*, 2008: 43-45). Collective gardens, although different in nature, have a common objective of combating food insecurity, and educating and empowering economically disadvantaged urban dwellers. They also make huge contributions to emergency kitchens.

Managed jointly by representatives of the city and farmers' organisations, community gardens comprise a variety of projects and objectives compared to collective gardens. They have been developed from being simply solutions for food security to becoming part of social development.

Some examples of these community and collective gardens include:

- Land-based ninety-eight community gardens (non-profit organisations), displaying independent characteristics in each garden's practices, managed by the City of Montréal.
- A combination of land, fruit trees, containers, green house and roof-based collective gardens; quite diverse in terms of purpose and management. These gardens include, but are not limited to:
  - Notre-Dame Grace gardens, managed by Action Communterre. Their aim is environmental education and food security;
  - Point Saint-Charles gardens, managed by ACSA Pointe Saint-Charles. Their aim is food security, collective kitchens and social, environmental and health services;
  - five collective gardens, managed by Rosemont Bouffe-Action. They aim to eradicate food insecurity among vulnerable groups by providing emergency food services, collective kitchens and collective purchasing groups; and
  - La Croisée de Longueuil garden, managed by La Croisée de Longueuil. This garden aims to bring about social integration by means of horticulture training and summer camping, as well as extra-curricular activities for children from 5 up to 12 years old (Duchemin *et al.*, 2008: 45).

Urban agriculture in Canada is progressing, but there are challenges, which include:

- Development and maintenance of projects: There is still a need to recognise urban farming initiatives as important and key to tackling socio-economic issues in poor urban households.
- Lack of adequate organisation with regard to projects: The isolation of gardens and their activities, although belonging to the same collective gardening group, is responsible of the lack of or slow progress of farming projects. For example, it was found that community gardens are usually omitted from other local organisations.

Overall, urban agriculture in Montréal provides social inclusion support (Duchemin *et al.*, 2008: 44-49).

#### 2.3.1.1.2 *The case of the United States of America (USA)*

Similar to urban agriculture in Canada, in the United States of America (USA) this sector still has to find its niche. Most of the urban agricultural projects in the USA have to shift from being simply social organisations (non-profit organisations and movements) where the focus is on education and community development projects, among others to becoming (individual) income generating (profitable) projects (Schneider, 2013:1; Wortman & Lovell, 2013: 1283-1294).

*“If they steal my food, let them do so, that is why it is on the streets... If kids grow kale, they eat kale, if they grow tomatoes, they eat tomatoes” Ron Finley, LA (TED YouTube, 2014).*

Ron Finley is one of a number of inspirational individuals involved in urban agriculture. He is from South Central, Los Angeles. Through his idea of “*Gangster Gardener*”, one man changed not only the perception of a city’s open spaces, but he also became an inspiration to many low income and poor people in his neighbourhood. Rebelling against the fast-food movement, he describes himself as a ‘*soil artist*’ whose mission is to change his neighbourhood by creating sustainable living. He is doing this by the simple means of reversing food production through organic gardening anywhere available and possible.

In a video clip on YouTube, Ron Finley talks about how in his neighbourhood most of his friends and neighbours have been affected by the lack of not only having enough, but also quality food. As Ron Finley says in the TED video clip, obesity is the indication that whatever the people are eating in this area, it is not good for their bodies.



*Figure 2.1: Ron Finley, founder of Gangster Gardener, Los Angeles*

*Source: YouTube*

Like Ron Finley, the idea of growing food locally and on doorsteps is increasingly being embraced and practised by many people in different communities in the USA. In many cities it is not surprising that there is a high demand for fresh food(s). Schneider (2013) argues that even restaurants have embarked on producing their own fresh food so that their chefs have access to fresh produce on the same day of cooking.

*“You can’t find fresher food anywhere,” says Sam Wortman, an assistant professor at the University of Illinois at Urbana-Champaign. “Chefs are literally picking produce the same day they’re cooking it in the restaurants” (Schneider, 2013: 1).*

While the idea of urban farming, such as Ron Finley’s ‘*Gangster Gardener*’ initiative, is being welcomed in the USA, Wortman and Lovell (2013) argue that for urban farming to become an economic and sustainable contributor, scientific-based research and inputs are necessary. Wortman and his team have embarked on experimental gardens in this regard. The examples are provided in figures 2.2. and 2.3. below.

The examples of experimental gardens by academics are also an indication of how much freshly produced food means to USA citizens. Below, figure 2.2. shows how much effort is being put into this practice for the benefit of the population.



*Figure 2.2: Ross Wagstaff, a graduate student, collects weather and atmospheric data from an experimental garden site. Picture: Courtesy of Sam Wortman. Source: Schneider, 2013*



*Figure 2.3: A diverse crop garden in Chicago. Picture: Courtesy of Sam Wortman  
Source: Schneider, 2013*

Although some challenges exist with regard to urban agriculture, farmers in the USA (as in other countries across the globe) show that the benefits far outweigh the challenges encountered. This fact keeps them motivated, and more concerted efforts are being made to make this sector successful in urban communities in this country.

Another feature of urban agriculture in North America is the increasing adoption of high-tech vertical farming<sup>3</sup>. Although the idea is that this type of urban agriculture is meant to address

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<sup>3</sup> “A practice of producing food (of farming) in vertically stacked layers”. It is a technique that allows food production in more challenging environments, especially where arable land is unfavourable or unavailable. Available at: <https://medium.com> Accessed 03/03/2019.

the challenges generated by land degradation and climate change, the problem is that it can only be practised by high-income city farmers.

### **2.3.1.2 Urban agriculture in Europe**

Urban agriculture on the European continent is said to have its roots in the Charlemagne era (Smit *et al.*, 2001b: 18). According to the authors, the emperor many centuries ago may have marked the start of urban agriculture when he issued a declaration on the choice of crops to be planted in urban areas in the Eighth Century (Smit *et al.*, 2001b: 18). The evolution of urban agriculture in Europe declined somewhat during World Wars I and II, as was the case in North America, but it has recently recovered with more privately-owned farming gardens established for reasons of self-sufficiency. In recent research findings by Piorr *et al.* (2018) it was found that modern-day European urban agricultural practices are being driven mainly by issues related to ageing, migration, gender and social inclusion.

All kinds of urban agricultural practices and specialisations ranging from community to private gardens, whether for leisure or commercial reasons, are found in Europe. Just as in North America, there has been much progress in terms of advocacy and support for urban and peri-urban agriculture in Europe. However, government policies related to urban agriculture still do not address the latter's needs sufficiently, thus leaving a huge gap between implementation and the potential success of European urban agriculture.

An unrealised feature of urban agricultural practices in Europe is the potential commercial benefits. The restrictions on commercial activities, especially in community gardens, hinder the progress of farmers (Piorr *et al.*, 2018: 9-11). The authors have also found that most of the poor interested in urban farming have to deal with unfavourable European Union (EU) policies, as well as poor implementation support such as funding strategies that separate urban and peri-urban agricultural practices (separately), thus leaving some peri-urban farmers struggling to achieve their objectives (Piorr *et al.*, 2018: 41-42). Nevertheless, despite these unfavourable policies, urban agriculture is advancing steadily as will be discussed in the following examples.

### 2.3.1.2.1 *The case of Germany*

While urban agriculture has been practised in Europe from as early as the Eighth Century, this kind of production had to wait until at least the Nineteenth Century when the movement for small-gardens and farms emerged in Germany (Smit *et al.*, 2001b: 18).

In Berlin, most urban agricultural initiatives are practised in a way that allows the gardens to be removed once reclaims or changes in land ownerships occur (Small, 2014: 1-2). In her article, Small (2014) provides insights on the following examples of urban agricultural projects in Berlin:

- *Nomadic Garden* is a green project that grows produce by using re-usable containers and 'burlap sacks' which allows for easy removal and re-installation of the gardens when necessary.
- Launched by Nomadic Green, the *Prinzessinnegarten or Princess Garden* is the large agricultural project in the *Kreuzberg area* that was started by local volunteers by converting and maintaining formerly unused and empty urban wasteland into a fruit and vegetable garden to which seven beehives were added later.
- There is also an aquaponics project, a rooftop concern run by what is known as *ECF Farm Systems*. This garden is known as *Frisch Von Dach*, meaning 'fresh from the roof'. ECF Farm Systems uses an 1 800m<sup>2</sup> area in an old building of Berlin's inner city and employs advanced technological means to produce sustainable high quality food. The business also supports a variety of emerging and interested farmers to establish their own farms across Europe.
- A Sky Bed garden also offers an accommodative place for local farmers to come together. This is done by promoting the use of moveable containers and placing farmers on a waiting list. A small minimum fee is paid per year to be able to have a garden.
- Schrebergarten in Berlin is a long established (for more than 150 years) gardening area consisting of many community gardens (Small, 2014: 2). These projects have changed from being initially established to serve as fresh air and physical education providers to becoming important food providing gardens, of which there are a total of 800 in Berlin (Small, 2014: 2).
- Bauer Mette is another traditional farm in Berlin that has been in the same place for six generations. This farm produces cereals and livestock.

Berlin's gardens are examples of the benefits gained from different urban agricultural projects that contribute to the city's sustainability. From food security, greening of the city, educational opportunities and social cohesion to enhancing biodiversity by using mainly movable planting containers or boxes, these gardens present another means to merge the city's developmental projects with those promoting sustainable living.

#### 2.3.1.2.2 *The case of the United Kingdom (UK)*

Urban farming in the United Kingdom (UK) is not marked by any distinguishing features. There are local adaptations and, as in European cities where urban agriculture is showing promise, local farmers continue to look for improvements in this sector.

In London there are examples of unfavourable policies and a lack of, or slow, implementation and inclusion of urban agriculture by policy makers and planners. For example, high technology-based farming is mostly encouraged and supported at the expense of low-income urban farmers and those struggling to promote sustainability in the food system (Lovett, 2017; Piorr *et al.*, 2018: 41-42). Typical examples of failed food sustainability initiatives include the Hackney City Farm, a peri-urban concern struggling due to a lack of funding (Piorr *et al.*, 2018: 42), while the produce of *GrowUp Urban Farms* (an aquaponics enterprise) is more expensive and unaffordable to poor urban dwellers. If urban agriculture becomes a food production tool for only rich people, then there is still a long way to go to tackle (urban) food insecurity (Lovett, 2017).

Yet, the United Kingdom is another example where all means have to be tried to show that urban agriculture is possible. Cambridgeshire-based urban gardening has been established through community-supported networks marked by empowerment and capacity building projects. An example is *Cambridge CropShare*, a community supported agriculture network that operates at grassroots (Du Cann, 2015). It is at this level that this study wishes to explore urban agriculture in relation to food security and poverty alleviation as a step towards sustainable development.

These networks not only allow urban farmers to keep most of the benefits generated by their harvest, they also facilitate knowledge and produce exchange – an important means to cope with urban socio-economic stresses. These networks have developed an unique way to trade

easily by using their own locally invented currency, thus facilitating educational empowerment for the local communities (Du Cann, 2015).

This example not only shows the presence of urban poverty even in developed countries such as the United Kingdom, but it also demonstrates that if efforts are combined, solutions to urban food insecurity (leading to unhealthy eating habits or unaffordable healthy food) can be found if the problem is addressed from the grassroots and local adaptation is allowed. Moreover, it shows, as is the case for many urban poor farmers in developing countries, that even if most government policies create difficulties for low-income farmers, the value of urban farming is beyond what is measured by contemporary views in development. Perhaps, evolving global socio-economic and environmental issues should be addressed by beginning at grassroots and by allowing the locals to look for and participate in their own solutions before making policies on their behalf without their participation. What is happening in these communities could serve as an example of what has to be done to achieve global sustainability, namely, developing a “bottom-up” model. It is crucial that a holistic approach to planning be implemented to achieve desired sustainability. If efforts are made to address socio-development challenges in a bottom-up approach by combining local social capital, indigenous knowledge and appropriate technology, the most suitable results are more likely to be achieved (Kaiser, 2012; Thomas, 2014).

### ***2.3.1.3 Urban agriculture in Latin America and the Caribbean***

As with cities elsewhere in the world, urban agriculture in Latin America is gaining in popularity, although it is not a new practice in this region. Urban agriculture is believed to have been in existence since the ‘*pre-Columbian civilisations*’ era, although it was destroyed by European arrivals. However, due to the connection the Latin American population has with nature and healthy consumption habits, urban agriculture has found its niche again in this region with its favourable climate. Also, technology-based practices, such as those found in Asia, are spreading in most Latin America’s cities, especially in Sao Paulo (Smit *et al.*, 2001b: 24).

### 2.3.1.3.1 *The case of Brazil*

As cities around the world try to find solutions for the demand for healthy food supply in urban areas, Brazil is also making its contribution. While there is a high demand for organic food products (that are not easily accessed by the urban poor), community and home gardens are being established in and around the cities of Brazil. The places of gardening include Brazilian favelas. A favela is a very dense urban area with no space for recreation, let alone for gardening. Despite the lack of space, this has not prevented inhabitants in favelas from engaging in urban agriculture, which is adapted to the architecture of the area. As Torres (2017) points out, gardening in a favela is either on a rooftop terrace (known as *laje*) or vertical, where gardens are established on walls.



*Figure 2.4: Luiz Alberto de Jesus with newly sown plants on his balcony in the Babilônia favela*

*Source: Torres, 2017*

One example of the urban gardens as mentioned by Torres (2017) is the *Project Favela Orgânica*. This project was founded in 2011 and is situated in the South Zone of Rio de Janeiro within the communities of *Babilônia* and *Chapéu Mangueira*. *Favela Orgânica*, at its establishment, aimed at public teaching and promoted home gardening, composting, healthy and conscious food consumption, and so on. Following its initial success, the positive outcomes of *Project Favela Orgânica* have inspired and generated other organic projects around the country. It is not hard to find information about different organisations that teach farming techniques. Moreover, the distribution of agricultural inputs, farming demonstrations and workshops carried out by these farming organisations, coupled with the City of Rio de Janeiro's investment in urban agriculture and co-ordination of administrative

tasks in more than 30 gardens, offer an exemplary sustainable model of urban agriculture in Brazil (Torres, 2017).

In addition, the Women's Development Bank financial initiatives have seen more women participating in urban agriculture, becoming a way to combat not only urban poverty, but also the oppression of women. Thus, as a source of income and dignity for the female participants, urban agriculture is also regarded as an emancipation tool for women (Ortiz, 2012).

In the context of Brazilian urban agriculture, the city of Belém must be considered. Here backyard food gardening is a unique characteristic associated with the city's urban farming. Situated in the northern part of Brazil, this is a city ravaged by poverty where there is more agricultural space available, where urban agriculture has been well established and up to 23% of urban farming is done in backyards (in spaces of less than 50m<sup>2</sup>) (Madaleno, 2000: 74).

Madaleno (2000) states that unlike other cases mentioned above which are dominated by rooftop gardening, this Amazonian city has open urban spaces, thus enabling the use of land farming which, in turn, has facilitated the raising of livestock such as poultry in the city.

Although farmers with different education levels participate in urban farming practices in Belém, the majority of this city's farmers are unemployed, and most of the experienced farmers (farmers whose occupation is none other than farming activities for a longtime) as well as women. It is also noteworthy that there are high unemployment rates among low-income farmers in Belém, and that most of them are natural medicine practitioners, which explains the dominance of natural/herb products. In addition, the high demand for fruit and vegetables has pushed municipal government officials to promote and sponsor urban farming projects along the fringe of the city. An example of a prominent initiative that has been sponsored is the *Green Belt Project*, where success has been achieved with poultry, vegetable and fruit farming (Madaleno, 2000: 74-76).

Despite the success in Belém's urban agriculture, a distinction should be made between urban and peri-urban farmers. While the latter tend to experience relative success in farming activities, the former experiences numerous challenges associated with the competition between the needs of farming and city developments (Madaleno, 2000: 76).

### 2.3.1.3.2 *The case of Mexico*

In Mexico City, as urban dwellers seek to lead a healthy lifestyle with food produced through more sustainable methods, urban agricultural projects are flourishing at a fast pace. From mostly educational to therapeutic to community capacity building gardens, these differentiated and innovative urban agricultural projects in Mexico City are examples of a thriving urban agricultural movement in the city. Mexico City is one of the Latin American cities that exports high quantities of urban agricultural produce and is one of the major Latin American cities that has representatives serving in the Latin American Urban Agriculture Research Network since it was founded in 1995 (Smit *et al.*, 2001b: 25).

Urban agriculture in Mexico City encompasses five dimensions, namely ecological, food, economic, social and symbolic in the four main urban agricultural production zones, but each of the four zones represents specific farming activities adapted according to the needs of each zone (Dieleman, 2017: 158). The four zones of urban farming in Mexico City are:

- The peri-urban: Concentrated in the south of Mexico City, this is a large agricultural area where livestock is mainly found. It is an area occupied by mostly indigenous people who hold on to their ancestral views and ways of living. In this area, the land is still communal, constituting a huge challenge to the progress of urban agriculture.
- The sub-urban: This is situated in the south where agricultural activities are operated in “*Chinampas*”. Horticulture and floriculture are dominant types of gardening here, and the local farmers are known to have adapted the use of treated water for irrigation.
- The inter-urban: This consists of the highly densely populated colonial part of the city where most of the public gardens are found.
- The other sub-urban: Created between 1960 and the 1980s, this is a migrants’ area consisting of poorly structured settlements where there is more rooftop gardening due to the poor quality of the soil in its open spaces (Dieleman, 2017: 158-162).

In summary, the characteristics of urban agriculture in Mexico City, according to its five dimensions, can be described as follows:

- food dimension – the high rate of production provides up to 20% of the city’s own food. Most of this food is produced in the peri-urban and southern part of the city (Dieleman, 2017: 162).

- economic dimension – this is characterised by the higher production of food in Mexico City and the highly organised marketing and distribution channels of food produced in the urban areas, although urban agriculture must still develop to a point where it can create full employment. This is a setback due to the differentiation of production zones.
- ecological dimension – which is not incorporated so well into urban agriculture. This is due to the fact that in the past century weather changes have caused a rise in the city's temperatures, leading to risks of floods. This, in turn, has led to the adoption of more rooftop gardening, but these are yet to be connected to the ecological infrastructure of the city (Dieleman, 2017: 160).
- social dimension – this differs in the four production zones. As far as communal gardens are concerned, this dimension is visible and well connected to the ecological dimension. However, it also comprises challenges arising from the socio-economic background of farmers in some areas, the top-down approach in the attempt to educate farmers about means to achieve successful and sustainable urban agricultural practices, as well as the overlapping attempts to maintain traditions while simultaneously trying to promote urban agricultural practices (Dieleman, 2017: 161).
- symbolic dimension – although normally neglected in the urban agriculture literature, argues Dieleman (2017), this is a specific urban agricultural feature in Mexico City. This practice is seen as a tool to return to the socio-economic values that were lost during the colonial era and through modernisation. The features of urban agriculture here reflects the city's tendency to revalue and reclaim what was lost while at the same time attempting to accommodate modernisation, as opposed to the current fractured lifestyles that facilitate more socio-economic, cultural and environmental divisions (Dieleman, 2017: 161).

#### *2.3.1.3.3 The case of Cuba*

Although not the first country to embark on urban agricultural practices, it has a unique story with urban agriculture implemented during the country's economic crisis of the 1990s, and has contributed to the cities in the country recovering from socio-economic stresses (Gonzalez-Corzo, 2016: 1-2).

Urban agriculture in Cuba, although it provides relatively little employment compared to the total share generated by the general agricultural sector, is a well-implemented system where the extensive support from the government with its decentralisation strategies, has made this sector a success. Urban agriculture's contribution to the country's local employment and economic freedom for urban dwellers is most remarkable in Havana City, a core region of Cuba's urban agriculture. In this city, one does not only find at least 97 *organopónicos* or organoponics (organic-based farming systems), 700 differentiated and 89 000 backyards gardens, and 170 livestock initiatives, among the different farms here, but there are also different co-operative units operating at grassroots to enhance the feasibility of activities, which lead to successful production (Gonzalez-Corzo, 2016: 2-3).

Recognised officially in 1997 (recognised officially by the Ministry of Agriculture the following year) when the then *Armed Forces Minister Raul Castro* announced September 27 as a national day for urban agriculture, this practice in Cuba emerged as an alternative strategy to cope with the national economic crisis of the 1990s (Gonzalez-Corzo, 2016: 3). During this period, Cuba's modern agriculture as the country's main economic source suffered enormous challenges due to a lack of oil supply. The machinery-based agricultural system collapsed as a result of the fall of the Soviet Union in 1991 (Gabbatiss, 2016; Gonzalez-Corzo, 2016: 3; Hamre, 2017: 1).

The embargo imposed on the country by the United States during that period left Cuba with the Soviet Union being its main trading partner, and the lack of petrol needed by Cuba's agricultural machinery resulted in an economic crisis for the country. To cope, with this crisis, Cuba switched to alternative agricultural means and this led to the adoption of large-scale urban farming (mainly in backyards and open spaces). Although it started as a way to combat hunger, Cuba's successful model of organic urban agriculture is contributing to the country's economy thanks to the co-operative efforts between the government and citizens (Roane, 2018: 2-3).

#### **2.3.1.4 *Urban agriculture in Asia***

While the development of urban gardens around the world is being promoted mainly because of the negative effects of climate change and increasing urban encroachment on food security, some Asian mega-cities are adopting alternative ways to not simply produce food in urban areas,

but to combat climate change by making cities greener. The examples of Asian mega-cities discussed here are usually characterised by tall buildings with little or no space for gardening in and around them.

In under-developed and developing countries, urban agricultural practices are aimed at meeting the demands for subsistence living, while in developing and developed countries, especially China, Singapore and Japan, such practices are geared towards offering a competitive way to ensure sustainable commercially oriented food provision. The latter is characterised by using technology to produce food in unprecedented ways and in unusual and soil-less spaces. With the exception of India's urban agricultural model, the examples that follow will illustrate this argument in more detail.

#### *2.3.1.4.1 The case of China*

Although all types of urban farming can be found in China's towns and cities, the large cities such as Beijing (well-known for successful urban agriculture practices), Shanghai Sunqiao, Chengdu and Shaoxing, among others, use a high level of technology in their practices, with each one having developed an innovative system and technology. For example, Shanghai Sunqiao's urban agricultural model is a high-tech agro-park, while Chengdu's is leisure-oriented. Shaoxing, on the other hand, has an urban agricultural model based on rooftops (Jianming, 2014).

Shanghai offers a multi-functional perspective of their modern and sustainable agricultural system. Sunqiao, for instance, is a 100-hectare urban agricultural area situated in the district of Shanghai, a Chinese megacity of almost 24 million inhabitants (Walsh, 2017).

According to Walsh (2017), due to urbanisation, China has lost more than 123 000km<sup>2</sup> of land which (previously) had been allocated to farming. Moreover, one of the challenges China is facing in terms of food production is related to soil pollution of a sixth of the remaining arable land in the country (Walsh, 2017). Shanghai is not encouraging the expansion of innovative urban farming projects simply because of the high demand for food by its inhabitants, who rely mainly on purchased food products. Rather, the city, constrained by its decreasing arable land, has taken into account its architecture as a city of skyscrapers and the diet of its population, which consists of 56% of leafy greens (Walsh, 2017), to invest

in vertical farming. Urban farming practices in Shanghai have a dynamism that also serves as a tool for education, social engagement, interaction and innovation.

A feature of Beijing's urban agriculture is its multifunctional farming system that has to take into account the different aspects of the city, including its topography, to achieve success (Peng *et al.*, 2015: 344). In their study, Peng *et al.* (2015) argue that Beijing's urban agriculture was designed to not only meet the food security needs of its residents, but also the economic and ecological needs and functions of the city were considered during planning. Due to different topographies found in Beijing, the urban agriculture practised there is varied to meet the differing needs to ensure the balance between land conservation (ecological need), agricultural production, and developmental need (expansion of the city). The urban agriculture in Beijing has evolved in different stages, but at least since 2009, the city's urban agriculture is becoming more technology-oriented while remaining a well-designed agricultural model to suit the topography of farming areas and encompass socio-economic and ecological functions (Peng *et al.*, 2015: 345).

#### 2.3.1.4.2 *The case of India*

India is also a country where urban agriculture is developing at a fast pace. As one of the most populated countries in the world and where the population is growing continuously, Indian urbanisation is increasing at a rapid pace. It has been predicted that the urban population will constitute 55% of the total Indian population by 2050 (Agarwal & Sinha, 2017: 236). Added to this, the consequences of global warming, soil pollution and land degradation, an unsustainable developmental agenda, including a shift in career directions, all contribute to a scarcity of resources (Awasthi, 2013: 48).

Although the model of Indian urban agriculture in most parts of the country falls between those found in developed and developing countries, in the examples below, Agarwal and Sinha (2017), Levenston (2018), Prashant (2018) and Awasthi (2013) give insights into the current trends of urban agriculture in India.

Agarwal and Sinha (2017) have argued that rooftop and terrace-based farms/gardens are spreading in India. One such project is the *Green Terraces roof-top of Kerala*. Officials in this state not only promote and support roof-top gardening, they also ensure that future

generations learn about sustainable living by implementing the project, *Livable Cities India*, in schools and teaching children how to explore organic farming from an early age (Levenston, 2018). Figure 2.5 below is an example of what is being done in this regard. The programme is being implemented in at least 49 schools in Kerala State.



**Figure 2.5:** An example of how urban agriculture is being promoted and implemented in schools in Kerala, India. Source: Levenston, 2018

According to Agarwal and Sinha (2017), such urban farming practices are also found in other Indian cities such as Mumbai and Bengaluru. In Mumbai there is the *Urban Leaves* project, and in Bengaluru the *Garden City Farmers* project where a group of intellectuals have agreed to teach and promote organic farming among the local citizens. In addition, vertical farming practices are being explored in cities such as Mumbai (Prashant, 2018).

In Calcutta, locals have found an innovative way of producing food by turning a garbage dumpsite into a productive farm. They not only managed to generate employment for about 20 000 unemployed youths, but they also overcame the theft of their produce – as the fields are unfenced - by simply rotating night-watch duties (Agarwal & Sinha, 2017: 237-238).

However, even if the aforementioned examples create the impression that urban agriculture has become very successful in India, some contrasting findings by Awasthi (2013) and Redwood-Martnez (2013) indicate that, as in other underdeveloped and developing countries, the poorest of the poor and/or low-income urban farmers in India experience huge challenges. The latter are mainly due to the unfavourable laws and policies implemented by city officials.

In India, there is a tendency to favour projects such as property developments and the building of infrastructure, such as roads, to farming activities.

An example is the Yamuna River-based farmers in the middle of the second largest city in India, Delhi, which is home to more than 18 million people (Awasthi, 2013: 50; Redwood-Martnez, 2013: 1-4), and farmers from slums that are situated near industrial areas (Redwood-Martnez, 2013: 2-4). These farmers do not usually succeed because they have to deal with the uncertainty of harvesting their produce due to frequent theft and the removal of crops by city officials, but also because they often do not have enough inputs to farm. Nevertheless, despite these challenges, these poor urban farmers persevere in their farming activities, usually because this is their only source of food and income. This is one of examples showing how urban agriculture enhances resilience among urban communities.

#### *2.3.1.4.3 The case of Japan*

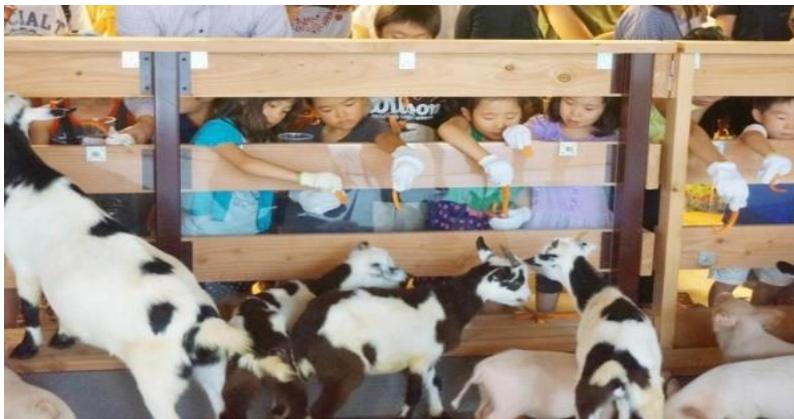
Although a country with a population that is declining, Japan has not lagged behind with regard to urban agriculture. In his article, Moreno-Penaranda (2011) argues that urban agriculture in Japan is unique compared to other developed countries. The presence of agricultural land in Japanese cities is in contrast to other developed countries where urbanisation is characterised by the absence of arable land in the urban areas. Furthermore, Moreno-Penaranda (2011) argues that urban agriculture generates a third of the country's agricultural produce, with urban farmers constituting about 25% of all the country's farmers.

Additionally, urban agriculture in Japan is more productive than conventional farming. This is reflected in the economic value per area of production and the revenue per farmer. As Moreno-Penaranda (2011) argues, figures from the Ministry of Agriculture, Forestry and Fisheries of 2010 show that urban agriculture in Japan is three per cent more productive and twice as profitable compared to the national average and conventional agriculture respectively.

However, as prominent as it may have been and despite the recognition of its importance by Japanese policy makers and officials, urban agriculture in Japan has been experiencing challenges lately. This is related not only to a decrease in the land available for urban

farming, but also to a drop in the number of urban farmers because of Japan's aging population. Other challenges include high land taxes and land-use zoning.

These challenges notwithstanding, urban agriculture in Japan has a promising future as the government tries to incorporate urban agriculture into its ecosystem programmes, while at the same time promoting urban farming systems such as rooftop gardens and vertical farming (Sim, 2018: 2). Examples of rooftop gardening are found in the cities of Kyoto and Tokyo. Kyoto's experience of loss of farmland due to residential and other development projects has caused the city to adopt rooftop gardening instead of conventional land-based farming (Oda *et al.*, 2018: 2). On the other hand, Tokyo's residents are encouraged by the city's management to participate in urban agriculture in an attempt to challenge rural agricultural decline. This has led to different kinds of farming, including animal husbandry and bee farming in the city's skyscrapers. An example of this exceptional kind of farming is Otemachi Bokujo ("Otemachi Farm"), situated on the 13<sup>th</sup> floor of one of the skyscrapers in the Otemachi business district (Sim, 2018: 2). Figure 2.6 below shows goats at the Otemachi Bokujo farm.



**Figure 2.6:** Children feeding goats on the 13<sup>th</sup> floor of the skyscraper which houses Otemachi Bokujo Farm in Tokyo. Picture: Pasona Group. Source: Sim, 2018

Sim (2018) asserts that the Otemachi Bokujo farm project seeks not only to combat a shortage of food production brought on by the decline in rural farming, but also aims to attract more people to consider agriculture as a career. Moreover, besides challenging food insecurity in Japan, this farm project presents workshops and demonstrations. Apart from offering public sessions on butter and ice-cream making, it has also opened a school associated with dairy farming (Sim, 2018: 2).

Although the urban agricultural sector in Japan is well adapted to the country's pace of urbanisation and technological development, there are challenges looming on the horizon as previously mentioned. Despite measures being taken to adapt to local contexts, most of cities' urban farming activities, such as those in Kyoto, are threatened by the demographic decline due to an aging population – from there the concept of '*shrinking cities*' in Japan (Sim, 2018: 2; Moreno-Penaranda, 2011; Oda *et al.*, 2018).

#### 2.3.1.4.4 *The case of Singapore*

Singapore is a highly urbanised country that imports as much as 90% of its food (Teng, 2013: 2). Hence, the country's efforts to ensure availability of food for its increasing urban population while minimising the amounts of food to be imported in future, should set an example for other developed or highly urbanised countries in terms of food sustainability (Teng, 2013: 2-4).

Just as in other Asian countries whose mega-cities are characterised by high buildings and less, or a lack of, arable land, Singapore has started to explore small-scale farming, rooftop and vertical gardens. One example of these projects is found at *Corncorp Collective*, which farms tilapia where the waste is used as a source of nutrients for plants (Johnson, 2017).

Taking the country's economic level into account, it may be strange to imagine it experiencing food insecurity, but it suffered disruptions in food supply from 2007 to 2008. Learning from this experience, the country is now making an effort to produce its own food and apply intensive strategies to achieve food sustainability (Teng, 2013: 1-3).

As in other countries, there are many obstacles in establishing urban agriculture in Singapore. Among these is the perception by locals that producing food locally and within the city is a foreign initiative. In a country where 90% of food is imported, the concept of urban farming has not yet taken root among the locals (Johnson, 2017: 2). Besides being misunderstood by the residents, emerging urban farmers in Singapore have to deal with challenges such as unstable higher temperatures and problems relating to air and soil contamination, as well as the limited availability of water.

However, efforts to overcome these challenges include the establishment of natural laboratories that could, through research, help to solve problems related to climate change, while the designing of green walls such as those in Figure 2.7 below is being encouraged to reduce temperatures that affect plants.



*Figure 2.7: The Tree House condominium in Bukit Panjang has green walls that are designed to reduce ambient temperature. Picture: Finbarr Fallon (Channel News Asia-CNA)*

*Source: Wong, 2017*

Another feature of urban agriculture in Singapore is that most of the prominent urban farmers are not simply ordinary farmers. As Zachariah (2017) states, while taking advantage offered by their education, a number of intellectuals are exploring new directions in local farming in the search to overcome the aforementioned obstacles, as shown in Figure 2.8.



*Figure 2.8: A picture of Associate Professor Lee Kim Seng (front) and the students behind the project that produces vegetables (visible in the picture) from waste. Source: Zachariah, 2017.*

Another interesting type of urban farm in Singapore is the business-based Citizen Farm, an 8000m<sup>2</sup> area at Jalan Penjara (Wasis, 2018). It specialises in producing mostly mushrooms, edible flowers and other microgreens. Moreover, it harvests insects meant to be used on the farm (Wasis, 2018: 2).

Community gardens and traditional or horticultural gardens are also found in Singapore, aimed at contributing not only to food security but also promoting urban sustainability. National parks, through its initiatives which include “*Community In Bloom (CIB) Initiatives-CIB Ambassadors*”, is run by volunteers and offers a platform to facilitate public participation in community and individual gardens. It not only promotes stewardship and relationships between community and individual farmers, it also awards those volunteers that perform best in developing gardens with edible products. Farmers are also motivated through regular best farmer competitions, and the prizes include cash and seeds (National Parks Board, Singapore, 2018). Figure 2.9 below and table 2.1 illustrate this stakeholder and government supported initiative.



*Figures: 2.9: Illustration of vegetables in the best farmer competition, Singapore*

*Source: National Parks Board, Singapore*

The following prizes are awarded for each winning fruit and/or vegetable type.

**Table 2.1: Prizes to be won in the best farmer competition, Singapore**

Champion	\$400 cash and \$100 worth of gardening products
First runner-up	\$300 cash and \$100 worth of gardening products
Second runner-up	\$200 cash and \$100 worth of gardening products
Consolation prizes (seven recipients)	\$100 worth of gardening products

*Source: Adapted from National Parks Board, Singapore, 2018.*

### 2.3.2 Urban agriculture in Africa

Earlier, it had been argued that there is a steady increase in urbanisation globally. In Africa, especially in Sub-Saharan countries, researchers have projected growth rates ranging from 30% to 47% of the total population between 2005 and 2030 (UN HABITAT, 2006 in Sithole

*et al.*, 2012: 78). Other scholars have argued that by 2050 Africa will have more citizens in urban areas than North America, Europe and Latin America combined (Parnell & Walawege, 2011: 16).

An example of the high growth rate in urbanisation is found in South Africa. According to Battersby (2011), urbanisation in South Africa has already reached more than 60%, and the expectation is that this growth will reach about 80% by the mid-century (Battersby (2011: 1). Such a high rate of urban growth brings about challenges such as increased food insecurity, especially in Sub-Saharan African countries where more than 33% of the people are undernourished (UN HABITAT, 2007 in Sithole *et al.*, 2012: 78).

Moreover, it is projected that food insecurity will increase in Africa due to climate change, which contributes to the loss of arable land, thus leading to more hunger, higher food prices and further malnutrition (Dubbeling & Pasquini, 2010: 3-4). On top of unemployment and undernourishment, urban life in Africa is also threatened by more and unhealthier food consumption, resulting from imported (unhealthy) processed foods, which in turn place a strain on public health services that do not rate among the best in most African cities, especially in the slum areas of Sub-Saharan cities (Nwuneli, 2018: 1-3). Slum areas are home to the majority of the urban poor who face most of the challenges related to socio-economic and environmental issues. Due to financial constraints, the vulnerability of slum dwellers is not only due to their not having access to healthy food, but also because they live in undesirable conditions where a lack of proper sanitation and clean drinking water favours the proliferation of diseases in such environments (Ramin, 2009: 886-887).

As more people move to the cities in search of greener pastures, urban poverty is more likely to increase due to a lack of employment and proper sources of income. In turn, urban poverty is likely to lead to deteriorating socio-economic conditions, resulting in poorer health of residents. This contributes to the decline of the country's economy, resulting in more corruption and socio-economic conflicts, more rural to urban, urban to urban or country-to-country migrations, with the cycle repeating itself continuously. As more imported processed foods affect people's health negatively, the urban poor, who mostly rely on purchased food, suffer a double whammy as they struggle to put food on the table. This struggle is partly due to rising food prices, leading to an increase in food insecurity (Wright *et al.*, 2014: 579-582).

Besides the projected deterioration in the weather patterns in Africa, continuous conflicts, growing inequality and extreme poverty all influence urbanisation on the continent, particularly in poorly managed cities (ClimDev-Africa, 2013: 1-3; Parnell & Walawege, 2011: 12-20).

In Africa the steady growth in urbanisation required new urban planning and policies to accommodate the needs of urban populations, including promoting sustainable development goals, food security and poverty alleviation. Urban agriculture is gaining more currency as a means to respond to urban food demand (Sithole *et al.*, 2012: 250). However, even though it has been practised in African cities over the years, lately urban agriculture has been neglected and undervalued by public officials and policy makers compared to other developing countries (Binns & Lynch, 1998: 778). This undervaluation, or rather the view by government officials that agriculture is a rural rather than an urban matter, is one, if not the main, challenge hindering the growth of urban agriculture in African countries.

The result is that many aspiring farmers find themselves with no or few options, in terms of urban agricultural inputs such as little arable land, a lack of water for irrigation, and impractical marketing strategies, among others. The lack of land reserved for urban agriculture leads to farmers using any open area in the city to engage in agricultural activities. Then, there is also the risk of their crops or produce being threatened by, among other things, theft and contamination by sewage.

Nevertheless, examples of urban agriculture found in Sub-Saharan Africa provide solid evidence that urban agriculture works in spite of the persistent problem that government officials fail to see that urban agriculture is part of and has to be incorporated into urban ecosystems. The only part of Sub-Saharan Africa that is showing major progress in this regard due to flexible and supportive public policy, although there are still challenges regarding land scarcity, is East Africa, specifically, Uganda (Conway, 2006: 1-4).

### **2.3.2.1 *The case of Egypt***

Unlike other Arab countries in North Africa, Egypt has a huge advantage in the form of the Nile River that comes with nutritious soil of a superior quality on its banks. However, despite the country being well positioned to produce enough food that could earn excellent agricultural revenues, Farouk (2017) states that the agricultural industry has been in decline for a few decades because of the neglect of farms. Coupled with extreme weather conditions related to climate change, this negligence has caused the country to experience economic challenges and placed financial constraints on many people, especially those who earn a living from agriculture. This has led to an increase in the loss of farmland as many farmers sold their farms to property developers and left their hometowns to work in cities as mainly taxi drivers (Farouk, 2017).

However, things are changing. Farouk (2017) points out that since 2015 the country has been trying to turn their prospects around. In this once giant agricultural master country, urban agriculture is flourishing even in places where arable land is not available. This is being done through innovative high-tech urban agricultural production, the newly launched project designed to reclaim one and a half million acres of its desert land to create more farmland. Besides this project, the agricultural industry in this country is also being revived through other government initiatives, such as the “*Do not sell your land*” policy, to encourage farmers to remain in agriculture (Farouk, 2017). Although not much detail is offered in this case of Egypt, the case has been included in this study for advocacy purposes during this era of climate change and global warming. This is designed to show the applicability and feasibility of urban agriculture even if the weather / climate conditions or land topographies of the area are not favourable enough to accommodate agricultural activities.

### **2.3.2.2 *The case of Kenya***

In Sub-Saharan Africa, Kenya is among the East African countries that have been found to have exemplary examples of urban agriculture. According to Dubbeling and Pasquini (2010), although African countries have been looking for the means to combat food insecurity by upgrading and increasing rural agricultural output, the reality has been an escalating loss of arable land which threatens the agricultural yields in rural and urban areas. For example, researchers have argued that within the next 30 years, 15% of arable land in East Africa will be lost mainly due to climate change. This will lead to a projected 65% increase in hunger in

Africa alone, leading to the inevitable likelihood of an increase in food prices (Dubbeling & Pasquini, 2010: 4).

In Kenyan cities such as Nairobi, people are turning to urban agriculture not so much to subsist, but more for entrepreneurial/business reasons. The participation of city dwellers in urban agriculture has been boosted by the search to achieve food security in cities as well as the marketing of urban farmers' produce to a growing number of supermarkets (Dubbeling & Pasquini, 2010: 6). Mentioned below are examples that show how far urban agriculture has progressed in this country.

A report in Kenyan Business Today (2014), tells of Mr Caleb Karuga, a former journalist, who quit his journalistic career after the inspiration he drew from his investigative work to become a full-time farmer. His success in farming shortly after quitting his job has become another inspiration in Kenya.



*Figure 2.10: Mr. Caleb Karuga and his farm in Kenya. Picture by Kenyan Business Today:*

*Source: Kenyan Business Today, 2014*

Nowadays, Mr Karuga, the founder of Wendy Farms, is not only a successful farmer, but also uses his farm as a learning tool for aspiring farmers and professionals attending inspiring demonstrations.

Another more traditional farming example from Kisumu and Thika cities shows the willingness to engage in urban farming in spite of the difficulties. As argued by Onyango *et al.* (2017) in their report after conducting research in both cities, which have 41.6% and 50.8% employment rates respectively, urban households have been found to practise either

urban or rural farming, and in some instances both. Their research found that in Kisumu, a combined share (urban and rural farmers with urban being 24%) of 58% of urban households are engaged in urban farming. In relation to urban farming, the most cultivated crops are vegetables compared to rural farming. Their research found that a fourth of urban households participate in *urban agriculture* while a third participate in *urban-based rural agriculture* (Onyango et al., 2017: 231- 239).

The researchers found that in spite of the challenges farmers faced, such as a lack of clean water for irrigation, farmers valued their own food production for household food security more than to depend on purchased food. Also, households engaged in farming activities were found to be better off in terms of food security, in contrast to those who are not participating in farming activities (Onyango *et al.*, 2017: 231-239).

Commercially oriented urban agricultural practices in Kenya have brought forth more innovative ideas to accommodate the needs of the cities. An example of this can be seen in Figure 2.11 below. The recently launched project, initially in Kisumu, Ukulima (meaning farming) Tech, shows that even in African cities highly advanced means can be used to produce food if efforts are combined for a good cause (Murori, 2016). In Nairobi, this project is applying innovative solutions to challenges experienced in the agricultural sector and it is said to have already made existence easier for farmers who are able to afford it (Murori, 2016).



**Figures 2.11. Ukulima Tech, a project that is being developed in Kenya**

**Source: Murori, 2016**

Installed on balconies, in backyards and on verandahs, the Ukulima Tech equipment uses solar energy in two modes of operation, namely manual or automatic, for the irrigation of

crops. While the manual method allows the farmer to irrigate the crops by turning the water tank on and off, the automatic method uses a cell phone which is programmed to communicate with the water tank and allows the farmer to simply press a button, even if she or he is (may) not (be) near the garden (Murori, 2016). The three examples discussed here are found in individual, private/professional and commercial farming activities where urban agriculture practices contribute to the upliftment of the lives of the individuals who participate.

### **2.3.2.3 The case of Uganda**

This East African country, known for its urban agriculture, shows that this type of farming in Sub-Saharan Africa may be taking another step forward in terms of innovation and achieving sustainable development. Urban agriculture in Kampala is not a new phenomenon, having been established in the city since the 1970s after the country's then president, General Idi Amin, expelled Ugandans originating from Asia in a so-called 'economy of war' or 'Africanisation of (the) economy' (Nuwagaba *et al.*, 2003). Kampala experienced economic hardships as those of Asian origin were the main owners of industries and commercial businesses, with their repatriation leading to the collapse of Uganda's economy.

Also in that period, the political crisis and attendant poor service delivery exacerbated migration from rural to urban areas. In the end, the combination of an already collapsing political economy and an increasing urban population led to an economic shutdown. Kampala residents found themselves with no other choice but to develop their own means of dealing with the crisis, and that is when urban agriculture took off. Much like the example of Cuba, the farmers of Kampala resorted to any kind of farming activity, from livestock to vegetables, to provide for their families and also save money for other needs (Nuwagaba *et al.*, 2003: 2-3).

Although the government was trying to accommodate farming activities and farmers' needs in Kampala, farmers struggled with land scarcity, poor policies, and harassment by officials of those farmers who could not comply with the rules. Particularly land scarcity hindered farming activities in the city. Nevertheless, in a city where urban agriculture contributes to 66% of employment and 60% of food required by local residents, urban farmers had to persevere with their so-called illegal farming activities (Nuwagaba *et al.*, 2003: 9). This led to

the tolerance of urban farming until 2004, when policies regulating urban farming were amended to legalise farming activities in Kampala (Conway, 2006: 1-3).

Along with Cuba, Kampala has shown how urban agriculture is contributing to sustainable development. According to Nuwagaba *et al.* (2003), the achievements of urban agriculture in Kampala can also be associated with the city council's Urban Agricultural Unit that was established to deal with issues relating to it. This Unit, based in the council's Production and Marketing Department, supports and guides communities in urban farming activities. Although the department acknowledges setbacks such as a lack of sufficient financial aid to farmers, some achievements include the training of farmers and the management of domestic garbage.

Although the city still follows a rural-urban agricultural model, Kampala's urban agricultural practices have progressed through various stages to the point where farmers are able to generate incomes and not just meet the city's needs. In the following examples, trends of Kampala's urban agriculture are highlighted, including advancements for wealth creation in the sector.

*"I am passionate about farming and it's through urban farming that we can alleviate urban poverty when the entire family engages in income generating activity", said Dr Diana Nsubuga (Oketcho, 2017).* Kwagala Integrated Farm (2017) is one of the outstanding urban farms in Kampala. Started by Dr Diana Nsubuga, a specialist in public health, as a means to not only eliminate transport fees spent in the search for food far away from home, but also to diversify people's diets and save income, Kwagala Integrated Farm is becoming one of the exemplary farms in organic farming. Since its establishment, this half acre farm has developed from being a family garden to a farm run along business lines (Kwagala Integrated Farm, 2017; Oketcho, 2017). Besides providing training opportunities for aspiring farmers and stakeholders, especially women, the farm, thanks to the support received from the National Research Organisation, is producing other economic products such as biogas, organic fertilisers, odour neutralisers, soil boosters, and so on (Kwagala Integrated Farm, 2017; Oketcho, 2017). Below, Figure 2.12 illustrates some highlights at the Kwagala Integrated Farm.



**Figure 2.12: Women and students participating in farming training at Kwagala Integrated Farm**  
**Source: Kwagala Integrated Farm gallery**

Kwagala Integrated Farm (2017) is not alone in trying to promote urban farming as a source of urban food security and poverty alleviation. In the fast-growing Kampala, where local urban farmers supply 70% (Conway, 2006: 4) of poultry products consumed, the success of regulating urban farming has reached the point where it is possible to develop a career and run a farm as a business venture. Other interesting examples in this regard include John Kiwanuka, an engineering graduate, who turned to rabbit rearing as a career and business. Not only does his farm produce rabbit meat and so contribute to a diversified healthy diet, but this young entrepreneur has expanded his production by selling rabbit urine as a rich organic fertiliser (CGTN Africa, 2018). Similarly, farmer Joanna Haba Mugisha in Kampala is generating income and sustaining her family by turning rabbit urine into organic manure (Ainebyoona, 2017).

These examples from Kampala show that through well-implemented urban agriculture, sustainable development can be achieved in African cities even if land scarcity is still a major barrier, especially for low-income farmers (Nuwagaba *et al.*, 2003: 1-4; Conway, 2006: 1-9). Even if high-tech agricultural models are not yet established, public tolerance of livestock in the city will lead to sustainable development and an asset as another source of renewable energy is being embraced and developed.

In spite of the success, land tenure is still a huge challenge, especially for women, who constitute the majority of those excluded due to a lack of land and/or not having the means to own land (Nuwagaba *et al.*, 2003: 4).

#### ***2.3.2.4 The case of Zambia***

Zambia is no different in terms of progress and the challenges facing urban agriculture. An example of the successful emergence of urban farming in this country can be found in the city of Ndola. According to RUA Foundation (2008) and Binns and Nel (2010), Ndola was the main manufacturing city in the Zambian mining area from 1980 to 1990. However, this changed dramatically when the falling copper price caused the government to privatise the companies. This impacted on the region negatively, leaving 75% of the local residents in poverty and 45% unemployed (RUA Foundation, 2008: 1; Binns & Nel, 2010). As in Kampala and Cuba, urban agriculture became an alternative means for the locals to survive, and it has been playing a huge role in their self-reliance ever since.

The RUA Foundation (2008: 2-3) claims that at least 37% of female-headed households – females being the majority of urban farmers in the cities – have improved their livelihoods by relying on urban agriculture. Though they were initially a means of survival, Ndola's farming activities are becoming more business-oriented. At least 39% of urban farmers have been found to use urban agriculture as their main source of income, and 44% regard it as their second main income generator (Binns & Nel, 2010: 5).

Although already regarded as a success, urban agriculture in Zambia is no different from elsewhere in Africa in terms of challenges. Depending on the type of farming activity, intended produce and area of production, some challenges include unfavourable and/or restrictive municipal bylaws, a lack of irrigation water, land tenure policies, a lack of efficient agricultural inputs, and a shortage of tools. Other challenges include long distances between farmers' households and farms, a lack of knowledge about crops and livestock diseases and pests, as well as a lack of proper marketing channels for the produce (RUA Foundation, 2008: 9).

#### ***2.3.2.5 The case of Zimbabwe***

Compared to the aforementioned cases in Africa, trends in Zimbabwean urban agriculture are different for several reasons. The country has been subjected to many economic challenges, including high unemployment and increased food prices. To cope with economic challenges and food insecurity, the citizens – encouraged by officials who previously had regarded urban agriculture as illegal – embarked on urban farming as a means to food security and self-

reliance at least since 2002 (Gondo *et al.*, 2017: 53). Although regarded primarily as a means to promote food security, urban agriculture in Zimbabwe is not only practised by the urban poor. People from all walks of life are found to participate in urban agriculture. An example are the farmers in Old Pumula, a suburb in Bulawayo, where the farmers range from being pensioners, unemployed to holders of odd jobs, to middle class residents. They were all found practicing urban agriculture as a means to ensure availability of food and provide additional income (Ncube & Ncube, 2016: 772).

However, although urban agriculture has been proven to help farmers in terms of poverty alleviation and food security, it (urban agriculture in Zimbabwe) still faces many challenges in Zimbabwe. These include the shortage of irrigation water, lack of agricultural inputs, and unfavourable policies. The destruction of already planted crops due to illegal claims by officials and unclear and controversial environmental policies, in addition to expensive permit charges, as well as favouritism in allocating urban farmland, all contributed to slow progress of urban agriculture in Zimbabwe (Gondo *et al.*, 2017: 54; Moyo, 2013: 129-133; Ncube & Ncube, 2016: 776-781).

## **2.4 URBAN AGRICULTURE: IMPACTS AND CHALLENGES**

### **2.4.1 Impacts of urban agriculture**

#### ***2.4.1.1 Urban agriculture: Getting into practice***

Earlier in this chapter, it was argued by different authors that many urban dwellers are, or have been, practising urban agriculture for a lengthy period, but most of them are illegal, or unrecorded. This creates a challenge in the assessment of the impact of urban agriculture in relation to food security and urban poverty alleviation. It is difficult for urban farmers to meet all their needs through farming because in most cities, especially in under- and developing countries, it is not yet considered necessary to incorporate urban agriculture into city planning. There is a significant gap between the practice of urban farming and having access to technical assistance, as well as a lack of involvement by city officials, stakeholders and role-players. Additionally, the lack of information and data make it impossible for urban farmers to achieve success in low and middle-income countries where this sector, if given proper attention, could contribute substantially in tackling poverty and food insecurity. (Ikerd, 2017: 13-15).

In each city, urban agriculture and its impacts could also be considered along the following dimensions: the type of actors involved and the purpose of farming activities, as well as policies and regulations. The latter include farmers' access to support such as agricultural inputs and land tenure security.

#### **2.4.1.2 Who participates in urban agriculture and why?**

##### **\*Types of participants and products made**

Various authors have argued that the majority of urban farmers are poor who are seeking to alleviate poverty, but this is changing because people from all walks of life can now be found in this sector. The farming activities can range from food, animals, and non-food products (for example selling compost, seeds, flours, and so on) to a mixture of these, with preference given to vegetables. In general, middle class farmers tend to participate in farming activities that offer a commercial opportunity and they specialise in products that meet the needs of their clients. Moreover, some urban farms or gardens are classified as community/collectives, associations, cooperatives, and as Ngo's. Overall, women constitute the majority of farmers, while the youth are less involved (Mougeot, 2005: 14-15).

##### **\*Types/purposes of urban agricultural practices**

It is necessary to distinguish between the practices in urban agriculture, depending on whether it is peri-urban or intra-urban, and the objective of the farmer or institution. Considering the aforementioned cases, there are at least three perspectives:

- *Social perspective:* Linked mainly with community, institutional and open space gardens, for this perspective urban farming is meant to respond mainly to the subsistence needs of poor urban households. Also, urban agricultural practices are meant to uplift the lives of the urban poor, contribute to food security, poverty alleviation, community capacity building, and social inclusivity, and there is a cash contribution towards investment. Once successful, farmers sell the surplus for additional income.
- *Economic perspective:* Linked to commercial and profitable agricultural practices, it encompasses small-scale concerns such as a family gardening company and large-scale farms. Being commercially oriented, these farming activities aim to maximise

profits and usually include both food and non-food products such as medicinal herbs. They may also include processing agricultural products.

- *Ecological perspective:* This concerns farms trying to achieve several objectives simultaneously. Besides producing food, they also consider environmental needs such as recycling by re-using organic waste material, for example. They may also contribute to the socio-psychological needs of people by providing leisure and/or recreational opportunities (Van Veenhuizen & Danso, 2007: 22-23).

### **\*Urban agriculture according to the location and mode of production**

Urban agricultural practices comprise those activities conducted inside the city (intra-city) or on the fringes of the city (peri-urban). In general, high-tech commercial and profit-oriented farming activities are found in the large cities of developed countries, while primarily subsistence and food security-oriented small-scale farms are found in developing countries. Although urban agriculture is advancing, high-tech farms are not found very often, particularly in developing countries, and in some instances are absent in certain regions, due mainly to a lack of finances (Lovett, 2017; Piorr et al., 2018: 41-42; Van Veenhuizen & Danso, 2007: 31-39).

#### ***2.4.1.3 Policies, regulations and related issues***

##### **\*Policies and regulations**

Urban agriculture is considered to contribute to food security within the households of urban farmers and beyond; and to sustainability in general. However, this claim has not been supported by authors such as Korth et al. (2014); Badami & Ramankutty (2015); Peng et al., (2015) as discussed earlier in this chapter. Contrasting arguments are based on a lack of adequate evidence on the contribution of urban agriculture. This lack of evidence is not simply caused by the absence of empirical findings, but attention should also be drawn to the fact that urban agricultural practices are still hindered by unfavourable policies and regulations, especially in under-developed and developing countries.

Due to the intolerance of farming activities by officials who regard urban agriculture as illegal or unfit for the urban system, restrictions are imposed on farming activities or these activities are simply ignored. Ultimately, restrictive measures would threaten the progress of

urban farming, cause a lack of interest, or leave room for impractical and risky practices. The latter usually yields inadequate or unhealthy produce. Considering the aforementioned examples, it has been shown that favourable policies play a key role in the success of urban agricultural practices (Sithole *et al.*, 2012: 255-256; Awasthi, 2013: 50 and Redwood-Martinez, 2013: 2-4).

#### **\*Land tenure/availability**

Land tenure is also a major factor in the choice and practice of urban agriculture. Due to a lack of arable land in cities, farmers usually have to use whatever space is available, and farming may be small-scale or large-scale, high tech, vertical, on rooftops or balconies. Different spaces shape the choice of farming practice.

#### **\*Access to agricultural inputs**

This is another factor shaping the character of urban agricultural activities. Usually the urban poor, who would need more support in terms of inputs, find themselves with few options, failure or no progress in their farming activities due to lack of access to inputs, such as finance, seeds, compost, fertilisers, pesticides, and so on.

#### **\*Access to information and training**

This is equally important. In order to succeed in urban agriculture, farmers need information on what to do and how to do it. This may include training and the marketing of produce. There is a noticeable difference between farmers who are educated and financially stable, and those who are not, including the fact that these two basic types of farmers do not engage in the same kind of agricultural activities.

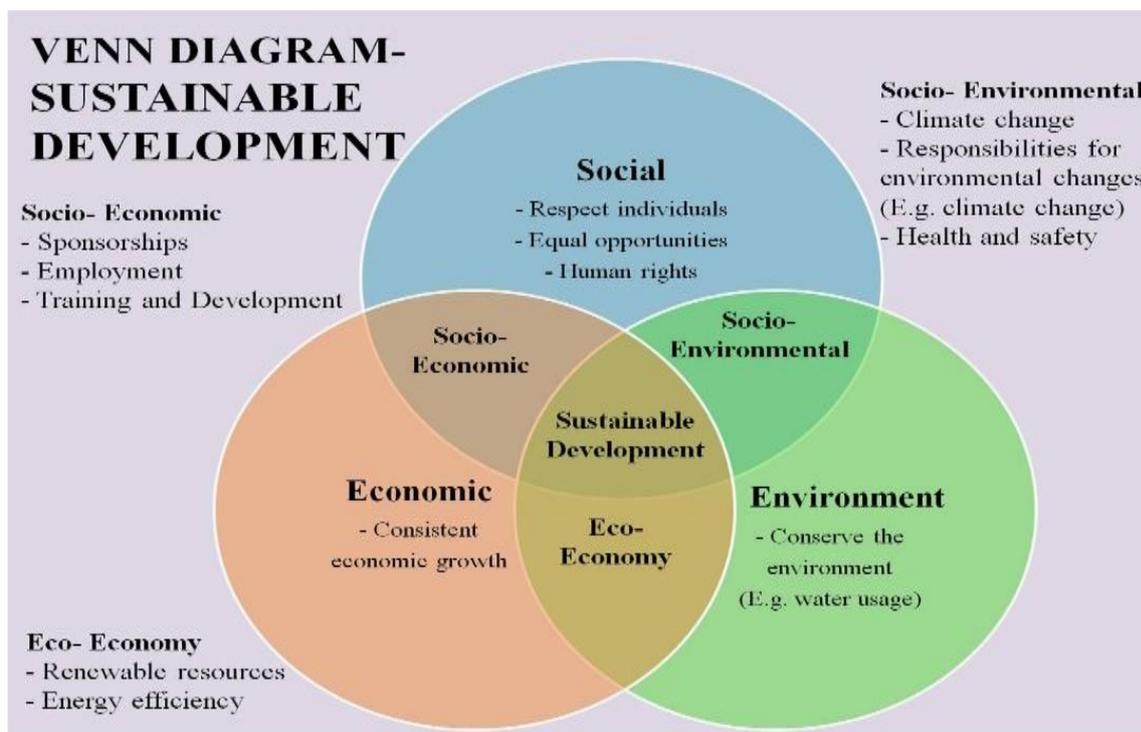
## **2.4.2 Linking urban agriculture to sustainable development**

### ***2.4.2.1 The meaning of sustainable development***

The need to place sustainability at the core of development agendas has led to most countries taking action in this regard. However, very little has been achieved so far, as pointed out earlier. Due to conflicting needs, countries have struggled to accommodate the social, economic and environmental dimensions of sustainable development. In terms of the assertion by the Brundtland Commission (1987), namely “*development that meets the needs of the present without compromising the ability of future generations to meet their own*

needs”, it is crucial that all three dimensions of sustainable development receive a fair share of attention in the development agendas of countries if sustainability is to be achieved. Favouring the needs of one over the other has shown to disrupt the sustainability of life as it is reflected in most Twenty-first Century challenges such as global warming and climate change (Sassen, 2009: 1-8; Deelstra & Girardet, 2000: 43- 53).

The interconnectedness of the three dimensions of sustainable development is illustrated in Figure 2.13 below.



*Figure 2.13: Venn diagram - Sustainable development*

*Source: Mui Wo, 2014*

#### **2.4.2.2 Views on sustainability versus development**

Urbanisation or the establishment of more (developed) cities are necessary and have brought about positive changes to human livelihoods and history. The world has now become “one room” thanks to technological advances that make communications and transport much easier.

However, despite these positive changes, authors have pointed out the negative effects of “developmental” projects. Nowadays, there is a lot of pressure to achieve “sustainable

development”, a concept that comprises of two ideas: ‘sustainable’ and ‘development’. If today’s attempts by different countries are about trying to achieve sustainable development, one simple assumption regarding this challenge is that the existing developmental course is simply not sustainable (UN, 2013: 8).

The proof of this argument can be industrialisation and manufacturing that brought positive changes to the lives of people, including the treatment, prevention, even eradication of former epidemics, easy communication and trade. On the other hand, one of the reasons why the challenge to achieve sustainability is tremendous is because the same sources that have led to positive changes, have also brought about negative effects on our daily lives. For example, growing industrialisation and manufacturing have contributed to the deterioration of the environment and the quality of human lives because of atmospheric, water and soil pollution. Excessive pollution on its own has contributed to climate change and its negative consequences (Orsini *et al.*, 2013: 14-18; Deelstra & Girardet, 2000: 43- 53); Department of Environmental Affairs and Tourism, 2004: 16-21).

For example, climate change and soil pollution have contributed to the rising of unpredictable weather changes, drought, hunger, growing urbanisation, poverty and non-communicable food insecurity-related diseases/health challenges. These challenges are enormous, specifically in cities because city dwellers rely mostly on purchased foods. This situation is a double burden for the urban poor whose incomes are not secured. It is in this regard that urban agriculture is being pursued as a means to address these challenges.

### ***2.4.2.3 How is urban agriculture addressing poverty and food security challenges?***

#### ***2.4.2.3.1 Current global issues in relation to urbanisation and realities of urban poverty and food insecurity***

Urbanisation and globalisation are part of, if not the key elements, of “development”. On the one hand we hear and see the positive outcomes of these two elements, but on the other hand, the pursuit of wealth and economic growth has brought negative consequences to peoples’ lives. One of the examples mentioned earlier is that climate change is contributing to poverty, food insecurity, drought, hunger and migration, mainly from rural to urban areas (Sassen, 2009: 2-3).

Unprecedented migration and the growth of slums are causing strains on the resources of expanding cities, especially in under-developed and developing countries. The search for greener pastures in cities usually falls far short of the desired expectations, leading to the urban poor living under unbearable conditions and in extreme poverty. Ultimately, the consequences are not only hunger and food insecurity related to diseases, but easy channels are also created for social and environmental crimes, tensions and conflicts (Rohwerder, 2016: 11-13). In a similar argument, FAO (2008: 15) points out that malnutrition is becoming an increasing concern in urban areas, especially in Africa. In Sub-Saharan cities, the urban poor spend between 54% and 76% of their meagre incomes on food alone. With the rise of economic inequality and high unemployment rates, the arguments above help to put into perspective the daily struggle waged by poor urban dwellers to put food on the table. Amidst rapid urbanisation, urban poverty is becoming increasingly evident. In urban areas, the fact that food has to be bought means that a lack of income simply leads to a lack of food.

#### *2.4.2.3.2 Urban agriculture: What is in it for the urban poor?*

Although there are different aspects to urban agriculture in developed countries compared to developing or underdeveloped countries, poor people who participate in urban food production do so to respond to their food needs. Even though in some countries the participation in urban agriculture can be interpreted as a hobby, the urban poor become involved in urban farming not only to diversify food consumption, but also to gain access to healthy food that would otherwise be inaccessible or unaffordable. Egal *et al.* (2001: 4) state it is estimated that poor people in urban areas spend about 60-80% of their incomes on food.

Gaining access to food in urban areas requires having disposable income. Unfortunately, most of the urban poor are unemployed, which means a lack of at least a regular income. Thus, participating in urban agriculture does not simply mean having access to one's own food, but also that the surplus can be sold to generate an income that is spent on other items (Stewart *et al.*, 2013: 6; Korth *et al.*, 2014: 2-3; FAO, 2008: 17).

Either way, urban agriculture contributes to food security and the availability of large amounts of food (whether through one's own production or through other farmers in the neighbourhood). It also offers different benefits to the poor by allowing them to buy cheaper and healthy food, contributing to poverty alleviation by reducing the amount of money spent

on food and creating the opportunity to increase income by selling surplus produce. This income is often spent on other non-food items such as housing, school fees, transport, health-care costs, and so on. Urban agriculture does play a crucial role in the lives of the urban poor (Egal *et al.*, 2001: 4).

#### **2.4.2.4 Other benefits of urban agriculture**

Some benefits of urban agriculture have been mentioned. Put simply, people are engaging in urban agriculture as an alternative means to ensure food security, thereby combating a lack of food and improving access to fresh produce. Being engaged in urban agricultural activities is also a way to restore the degraded environment, often the result of increased amounts of pesticides being used and soil erosion.

Urban agriculture can contribute to a resilient local economy through the development of a self-sufficient food system. Urban spaces used for agriculture contribute to the livelihoods and sustainability of individuals beyond nutrition and the need for money. For example, in community gardens most farms are organised into different groups, which provide social and economic support for each other, especially in times of hardship. They may help each other when, for example, someone is ill, facilitate conflict resolution, and assist in the buying of much needed materials. These aspects of local networks, social capital, resilience and indigenous knowledge systems lead to increased building blocks of capacity-building, empowerment and sustainability in different ways.

Urban farming makes a significant contribution to the wellbeing of a city and ultimately contributes to sustainability by means of enhancing local ecosystem services and biodiversity, while reducing urban footprints (Moreno-Penaranda, 2011: 2). Some key elements in relation to sustainability flowing from urban farming are addressed in the following points:

- ***Urban agriculture enhances urban food security***: Through increased food availability, stability and accessibility, urban agriculture contributes to the production of sustainable local food production, security and nutrition, thus becoming an important component of the national agricultural sector while there is declining productivity in rural areas (Stewart *et al.*, 2013: 5).
- ***Urban agriculture enhances resilience among urban communities***: The production of food in urban areas can be seen as a coping mechanism where there is severe food

insecurity and as a means for self-sustainability by generating employment opportunities (Olsson *et al.*, 2016: 2-3).

- ***Urban agriculture promotes community capacity-building***: By coming together for gardening, community capacity-building is another benefit of urban agriculture, which reaches far beyond the scope of growing food and has a significant community development component, which serves as a change agent within communities. Not only is a sense of belonging developed, but people could also learn conflict-management skills while resolving potential conflicts. More importantly, once they become food secure, their interaction generates other means to become more resilient amid different challenges.
- ***Urban agriculture contributes to sustainable livelihoods***: In order for a livelihood to be sustainable, as Krantz (2001: 6) points out, it has to be able to cope with and recover from shocks and stresses. Urban agriculture can contribute to the wellbeing and capabilities for future self-sustainability. For example, urban agriculture can help alleviate poverty by reducing the amounts of money spent on buying food.
- ***Urban agriculture leads to education and youth development opportunities***: Another social impact generated by urban agriculture is the provision of a medium for learning experiences, educational services, and youth development opportunities. Some of the youth programmes include nutritional values and elements, training for jobs and youth leadership opportunities, as well as raising awareness of environmental issues, ethics, food systems and sustainability (Golden, 2013: 10).
- ***Urban farming leads to the empowerment of communities***: As it has been argued by Swanepoel and De Beer (2006: 50-52), authentic development means more than just 'service delivery'; it implies that ownership of the means by which a group of people could go far in helping themselves shape their futures and reduce dependency on outside help. Being part of the building blocks of development, empowerment of communities would help to tackle not only dependency challenges, but also increasing food security.
- ***Urban agriculture is a tool for sustainable development***: Urban agriculture can provide many benefits to cities. The benefits include mostly increased access to fresh and diversified types of food, venues designed to be environment friendly, and nutritional education programmes. Hopwood (2005: 39) states that sustainable development results from the increased awareness of the links between worldwide

environmental and socio-economic problems. The latter has to do mostly with issues of poverty and inequality, and together with the former, there are increasing concerns about the future of the health of populations. Urban dwellers, poor families in particular, who practise urban agriculture, are not only spared from spending their income on purchased food (Egal *et al.* (2001: 4), they are also provided with fresh food as part of nutritious diets.

Generally, urban and peri-urban agriculture contribute to nutrition, food security and improved livelihoods in the following combined ways:

- providing for family self-consumption, thus contributing to nutritious diets and allowing for the saving of money spent on buying food;
- providing sources of income, by selling surplus product, or running commercially oriented projects;
- improving the supply of fresh and nutrient-rich foods in local markets at competitive prices.

Considering all of its potential benefits, and the increased support for farming in cities, it is only reasonable to view urban agriculture as a considerable contributor to urban sustainability. The benefits from urban agriculture do not relate only to food security, but there are also economic and environmental dimensions found in the benefits generated by this sector. Briefly, urban agriculture contributes to the provision of food, the greening of cities, and enhances biodiversity, social networking and inclusion (Korth *et al.*, 2014: 2-3).

### **2.4.3 Urban agriculture: Link to urban ecosystems and environmental management**

Discussing environmental management almost invariably leads to considering sustainability. Incorporated into sustainability, environmental management is a concept that is complex to define. Usually when the word 'environment' is used, there is a tendency to discount the human element to allow for an easy reflection on water, plants, animals and the atmosphere as the only, or at least, the main elements of the environment (Goosen, 2012: 6-13).

However, a more substantial reflection on the environment leads one to think of pollution, thus offering a way to also consider health and disease. Also, thinking of plants brings biodiversity and food into the picture. Further reflection on food also generates thoughts on agriculture and the means of food production, leading to thoughts about soil, water usage,

(food) waste, technology, infrastructures, energy, industrialisation, manufacturing, transportation, pollution, engineering services, conservation, (environmental) hazards, air quality and aesthetics. Protecting and managing the environment involves considering all of the aforementioned aspects holistically for the sustainability of life (Goosen, 2012: 6-7).

If urban agriculture is about food production, it has a connection with all the other elements involved in producing food; hence, the sector relates to various elements in the aforementioned paragraph. Cities are at the centre of the environment because of increasing urbanisation. Thus, whatever is happening inside cities has a huge influence on our environmental future and reaching sustainability.

A governance challenge concerns not only the environment as a space in which people live and interact, but also human security. The violence in cities, as well as other crimes, including economic crimes (Sassen, 2009: 2), are on the increase. As De Wit (2016: 695-698) argues, it is impossible to achieve sustainability if governors do not bind social, ecological and economic systems together. For example, city planners and policy makers should bear in mind that urban dwellers will not only need infrastructures (such as houses, roads, schools, hospitals, energy, water, shopping centres and industries), but they will also need food and a good health system to lead lives in which they fulfil their potential.

Advocates for sustainable development question the domination of post-war arguments concerning economic policies, where the growth of global trade and industry is regarded as the foundation of international wealth and wellbeing of humanity (Hopwood, 2005: 39). The consequences of this delusional development are reflected in many environmental challenges experienced today. Considering all its potential benefits, the meaning of sustainability and the increased support for farming in cities, it is only reasonable to view urban agriculture as a considerable contributor to urban sustainability. In short, urban agriculture is connected to and impacts on environmental management, in the same way it is connected to and influences sustainable development.

## **2.4.4 Urban agriculture challenges and critics**

### ***2.4.4.1 Urban agriculture challenges***

Since 1999 when it was first recognised, urban agriculture is changing at a fast pace, although challenges encountered are not isolated. These challenges are aggravated in poor countries

and in countries where policy makers still have to acknowledge it as an important part of urban ecosystems (FAO, 2008: 21). The main challenge encountered in the practice of urban agriculture relates to the fact of it being carried out in cities, but governments, through their policies, fail to recognise it as part of a city's life. This challenge is more prominent in developing countries. In addition, the availability of land, pollution, marketing of produce, theft of crops, lack of information and inputs for the poor constitute huge barriers to the progress of this sector. Challenges encountered by those practising urban agriculture can be classified according to environmental, social, political and economic dimensions (Agarwal & Sinha, 2017: 241).

***Regarding the environmental dimension:*** Although it is possible to establish home gardens, the ever present problem relates to the fact that most of those who participate, or who would like to participate in urban agriculture, do not have enough plots for gardening. This results in urban farmers practicing off-plot farming in unprotected (open) spaces (usually temporarily, unpractical, far from their homes or contaminated) which leads to the theft of their produce. Other than that, they have to borrow or rent farming plots from private owners, but in most cases this is hindered by a lack of finances.

Although urban agriculture contributes to the greening of cities, improved air quality and recycling, the possible pollution of water, soil and proliferation of water-borne diseases cannot be ruled out. Avoiding these challenges require urban agriculture to be well implemented and monitored. Hence, the practice still has a long way to go, especially in poor countries. Apart from the pollution generated by practices that are not well monitored, there is the problem associated with the contamination of urban food produced by either high concentrations of carbon dioxide from automobiles, untreated (industrial) waste or contaminated soil and/or plant containers due to the presence of toxic metals and chemicals, for example (Agarwal & Sinha, 2017: 241).

***Regarding the social and political dimensions:*** Urban agriculture is a demanding practice. Besides the long hours and dedication required from the farmer, it also takes times to harvest products, which can be seen as impractical to those requiring immediate relief. Poor farmers, besides being unable to obtain all of the information needed to ensure best practice, usually face huge challenges such as a lack of agricultural inputs due to financial constraints.

In terms of dealing with the political aspects of urban agriculture, urban farmers, with the exception of those in regions where it has been recognised and is encouraged, have to deal with the burden of impractical policies due to a lack of acknowledgement by government officials of urban agriculture as a potential contributor to the sustainability of cities. This usually results in farmers getting stuck, with little or no progress at all, and having to endure harsh punishments imposed on them by officials for *illegal* agricultural practices. Punishments include but are not limited to the removal of their produce (Moyo, 2013: 129-130).

***Regarding the economic dimension:*** Farmers practising urban agriculture encounter challenges related to theft of produce due to a lack of protection, compromised marketing because of a lack of proper information or the proper implementation (of policies) by governmental officials. Problems regarding the lack of or inadequate packaging processes, lack of transportation means to the point of sale and storage are also challenges for these farmers, especially those in under-developed countries (Ncube & Ncube, 2016; 771-782; Agarwal & Sinha, 2017: 241).

#### ***2.4.4.2 Urban agriculture: Critics***

In spite of varying findings and claims by scholars (Battersby, 2011; Stewart, 2013; Kinver, 2014; Stewart *et al.*, 2013; Korth *et al.*, 2014; Agarwal & Sinha, 2017; Ncube & Ncube, 2016) on the role of urban agriculture in ensuring food security and reduction of poverty, especially in low-income countries, this farming practice is not without its critics. Besides the lack of empirical evidence on its contribution to resolving (urban) socio-economic challenges, some critics have raised the possibility of it being harmful to health and the environment. These criticisms seem to discourage the recognition of the sector by government officials and having it included in the urban ecosystem.

Badami and Ramankutty (2015: 14) have argued that there was no concluding evidence that supports or invalidates the practice of urban agriculture as a means to tackle urban poverty. The authors assert that because of the many challenges faced by urban farmers, including a lack of land and inputs (for example seeds, seedlings, compost), it is almost impossible for urban agriculture to contribute adequately towards food security. Instead, the authors argue that the provision of employment that generates enough income to enable people to buy food

would be a better option. Ultimately, food service delivery should be at its best, they argue, because it will allow for affordable food.

Moreover, it has been argued by Gondo *et al.* (2017: 55) that some urban farmers, especially those farming in peri-urban areas, as in Johannesburg, use huge quantities of chemical fertilisers to increase their harvest. This not only misleads consumers, who may think that they are consuming organic products, but the authors contend that the farmers usually do not have (enough) knowledge nor guidance on how to control waste materials. They run the risk of contamination by heavy metals from these inorganic fertilisers, as was once found in Cairo, the authors claim.

Other critics of urban agriculture refer to the fact that many people who participate in this practice cannot be regarded as urban poor who are in much need of urban agriculture's socio-economic benefits although, regardless of social class, everyone needs a socio-economically improved livelihood. There are different views in this regard, but in general, the lack of information, skills, funding, marketing channels, financial constraints, poor government policies and a lack of interest make it difficult for poor people in cities to practice urban agriculture in a sustainable manner (Lovett, 2017).

## 2.5 SUMMARY

In this chapter, a literature review of trends in urban agriculture was conducted. Different cases and contexts in which urban agricultural practices take place have been covered. There is consensus among authors that there is a worldwide steady increase in urbanisation and that urban populations are growing exponentially.

It was found that the practices of urban agriculture, although differing from country to country, region to region, and area to area, are increasing and that they are generally driven by the search to achieve food security. Different aspects of urban agriculture in developed countries are considered as opposed to those in developing countries. In developed countries, although not at the same pace and in the same manner, the tendency to practise urban agriculture has to do mainly with it being a hobby and/or meeting the socio-psychological and commercial needs of higher income farmers, compared to urban farmers in developing countries. With regard to the latter, their main reason is to respond to their food needs and to

ensure the availability of food. Poor urban people also practice urban agriculture because of the need to diversify their diets; thus, urban farming helps them to access fresh food that would otherwise be inaccessible or unaffordable for them.

However, it should be noted that the search to produce fresh food is not only an objective of poor farmers, but it is becoming the driving force behind urban agriculture in developed countries in reaction against produce that has been treated with chemicals as part of industrial agricultural processes.

As indicated, in developed countries, a distinction should also be made between urban agriculture in East Asian countries such as China, Japan and Singapore, and those in North America and in European countries. The former group is dominated by high-tech commercial and ecologically oriented agricultural practices, while the latter is dominated by psycho-socio- oriented agricultural practices. Also, in the aforementioned Asian countries, the recognition and implementation of policies to promote this sector seem to prove its worth, as in North America and Europe. Overall, Africa still lags behind in this regard, with support from government officials in some countries, such as Uganda in particular, showing positive results. The practice of urban agriculture in South America is boosted by the connection of farmers to nature, although some cultural issues hamper progress in some areas.

Although urban agriculture is contributing remarkably and positively towards the socio-economic and ecological needs of urban dwellers, some authors argue that it has to be well implemented and monitored in order to offer acceptable contributions. Overall, urban agriculture succeeds where favourable policies are implemented, but continues to fail where government officials still battle to grasp its significance

## CHAPTER THREE: TRENDS OF URBAN AGRICULTURE IN SOUTH AFRICA

### 3.1 INTRODUCTION

Although South Africa is food secure at a national level because it can either import or produce enough food for the country's population, the country is becoming increasingly dependent on imports as the South African agricultural sector has been directed towards the exportation of food (Battersby *et al.*, 2015: 4). The increased amounts of imported food raise health concerns. Besides the increasing food prices, there is a risk in consuming more highly processed food. Nwuneli (2018: 1-2) explains that African urban life is being ravaged by enormous amounts of 'fake' processed food. The 2018 outbreak in South Africa of listeriosis is illustrative of the poor health, particularly in urban areas, that results from processed food.

Many urban poor are already found to be spending more than half of their incomes on insufficient and unhealthy food, have to hustle every day to put food on the table. Attempting to solve this challenge, some urban dwellers are engaging in urban agriculture as a means to deal with food insecurity. Researchers and networks of organisations, in spite of the critics, are continuing their advocacy to raise awareness about urban agriculture being a tool to help overcome urban poverty and food insecurity (Korth *et al.*, 2014: 2). In South Africa, instances of food insecurity have been found to be higher in urban areas. For example, in urban informal areas the prevalence of food insecurity was found to be 32% (Battersby *et al.*, 2015: 4).

Although still not as extensive compared to other cases covered in the previous chapter, the practice of urban agriculture in South Africa is being driven by a search for solutions to deal with food insecurity as well as by the negative impact on agricultural produce by climate change (Wright, 2014: 579-582; ClimDev-Africa, 2013: 2; Ziervogel, 2015: 1-3). As asserted by Meadows and Hoffman (2002), there is continuous soil and land degradation in the country, and this impacts on food production (Meadows & Hoffman, 2002: 430-435).

The combination of land and soil degradation with the rise of urbanisation contribute to the causes of unhealthy eating habits, in turn posing health risks such as the high rate of obesity

in the country, and its consequences. Considering this, as well as the unemployment rate and climate change, this raises issues of sustaining the livelihoods of citizens, particularly that of the urban poor, and the production and supply of food.

This chapter aims to consider the trends of urban agriculture in South Africa, with a focus on Johannesburg and Cape Town. This objective is motivated by the fact that there is little baseline data relating to urban agriculture in South Africa available.

## **3.2 THE NEED FOR URBAN AGRICULTURE IN SOUTH AFRICA**

South Africa offers an interesting case in terms of urban agriculture and food security. Apart from being a country where obesity and food insecurity go hand in hand, it is also a country where many efforts have been made to *elaborate food security and urban agricultural policies*, yet few people have benefited from these policies, or participate in local food production (Blignaut *et al.*, 2014: 74). Besides other socio-economic issues as reflected in the high crime rate, the high rate of unemployment, especially among the youth, and economic inequality, it is also a country where issues related to land degradation and climate change are becoming alarming (Wright *et al.*, 2014: 579-582; ClimDev-Africa, 2013: 2; Ziervogel, 2015: 1-3 Meadows & Hoffman, 2002: 430-435).

Meadows and Hoffman (2002) assert that land and soil degradation are harsh realities which form part of the country's naturally arid environment. A report by ClimDev-Africa (2013: 1-4) shows how much climate change is not only affecting food security, but also public health. It is not only about the risks associated with malnutrition and hunger coupled with high amounts of imported processed food, but also the increased chances of health complications, particularly among those who suffer from chronic diseases and the most vulnerable citizens, including the urban poor. Considering the country's failing, or failed, policies related to food security and urban agriculture, uncertainty may have emerged regarding the future of this method of farming.

### **3.2.1 Food security and food policy in South Africa**

In his presentation on food security in South Africa and FAO's stand on the matter on June 2-3, 2016, the latter's representative, Takavarasha (2016), recalled how South Africa prides

itself in being one of the countries that managed to reduce malnutrition by 2015. However, it soon became clear that the main reason for the conference was not to celebrate the reduction in malnutrition, but to raise awareness about an unfolding *emergency*, calling for urgent interventions. By reminding attendees how much *El Nino*-related weather conditions have cost the country in the recent past, the presenter called for what he described as “*a paradigm shift towards agriculture and food systems*”. This involved promoting systems that generated resilience, are more practical, highly productive and sustainability-aligned to achieve food security (Takavarasha, 2016). The presenter was advocating for what is known as “pulses”, using edible seeds of plants in the legume family (Global Pulse Confederation (GPC), 2018), as a way to promote food security.

After elaborating on the benefits of using “pulses”, both as a rich source of nutrients and its ability to help mitigate the consequence of environmental degradation, the presenter stated that efforts to promote food security through urban agriculture would be in vain if there was no collaboration with stakeholders.

Reflecting on the presentation by Takavarasha (2016), raised a few issues, such as whether this was the first time the country was trying to find solutions to food production concerns, and what the reasons could be for no increase in the availability of food with a decrease in food prices.

Taking climate change and the arid environment into account, one wonders why it took so long for measures to be instituted as livestock had started to perish across the country (Takavarasha, 2016), and why action was only taken after unprepared citizens were affected by health-related matters because of the water shortage crisis.

As indicated previously, the major challenge that urban, especially poor, farmers face is related to government policies and regulations that have failed to recognise urban agriculture as an important and productive sector that can help alleviate the effects of urbanisation and climate change. The examples of highly successful agricultural practices across the globe are marked by favourable policies and regulations where the contribution of urban agriculture to local ecosystems is acknowledged (Wilkinson, 2017: 1).

Even if some efforts were combined, argues Wilkinson (2017), such as the availability of funds from sources, including the Development Bank of Southern Africa to invest in aspiring farmers, urban agriculture has failed to achieve its objective in South Africa. Some of the reasons, says the author, include a lack of training, irregular support for farmers, a lack of agricultural inputs, such as equipment, and a lack of knowledge, all of which have hampered the growth of this sector. Wilkinson (2017) recognised that, in spite of these challenges, some community gardens have shown progress. The author is of the opinion that this could be attributed to the presence of NGOs and stakeholders who participate in urban activities with the communities they “support”.

Blignaut *et al.* (2014: 72-74) state that South African policy in relation to food security is marked by mismanagement, or misunderstanding, and by inadequately qualified officials. Moreover, the authors argue that the main reasons for policy failure are that efforts are not coordinated and that there is a tendency to include *improved rural livelihoods and food security policy* into different *strategic plans* by different departments at the same time, simply because this policy is part of “*Presidential outcomes*”. This failure results not only in a skirmish over the “*who has the what in their strategic plans*”, but this chaotic situation is exacerbated by the *rush to appoint unqualified and inexperienced staff*, leading to more wastage of resources and a lack of implementation - the latter being one of the largest challenges the country has to face.

Although the above authors point out government efforts to combat hunger through feeding schemes, diverse social welfare and other initiatives, including the *Integrated Nutrition Strategy (INS)*, which is designed to prevent malnutrition, they assert that little has been achieved through the implementation of these policies.

It could prove to be difficult to solve a complex problem such as food insecurity in South Africa through relief measures such as feeding schemes and social grants, if there are no policies and strategies for long-term solutions. And, with a growing population, particularly in urban areas, where malnutrition and hunger are becoming prominent, it would be wise to consider empowering the communities with measures to embark on a search for sustainable measures to achieve food security. But then questions regarding the way in which this should be achieved, the policy to be implemented, and who should participate, have to be answered.

Challenges related to food insecurity and unimplemented policies go hand in hand with escalating food prices, hunger and the persistence of poverty in cities, especially in poor households. It is interesting to consider one relief measure, namely social grants, in relation to food security challenges.

Devereux (2017) argues that social grants have failed to tackle malnutrition in the country, although the author recognises its contribution in alleviating the harsh realities experienced by poor people. According to Devereux (2017), taking into account South Africa's socio-economic challenges, it is hard to believe that a monthly child support grant of R380 (now R 430 from 1<sup>st</sup> October 2019) could resolve all the needs of the child for the entire month. Besides, it is well-known that most poor families are large, so it would not be realistic to expect that the R380 paid for one child would be spent solely on meeting the needs of only that child.

To confirm what has been mentioned in this study, Sanders *et al.* (2017) discuss the links between poverty, malnutrition, stunting, poor health, poor schooling, unemployment and the increase of poverty cycles, especially in urban areas. According to the authors, the cause for malnutrition is poverty, food insecurity, poor childcare, and the lack of access to basic services such as water and health care.

The authors suggest that to tackle problems associated with stunting one has to start by meeting the needs related to those problems, such as breastfeeding in the first years of life (Sanders *et al.*, 2017: 70). Interestingly, in a recent statistical release by Statistics South Africa (SSA) (2016b) about early childhood in the country (children aged 0-6), it was found that malnutrition is still a huge problem. This is reflected in the figures showing that almost a third of all the children surveyed in Gauteng and the Free State were found to be suffering from stunted growth due to chronic malnutrition (SSA, 2016b). This quote below from Sanders *et al.* (2017: 70) explains the root cause of many socio-economic, political and environmental problems in the country:

*“South Africa’s high rate of unemployment is the most important driver of poverty. The percentage of households with no link to the formal labour market increased dramatically from 30% in 1997 to 42% by 2008. Unemployment stood at 27.7% in the first quarter of 2017 with an expanded unemployment rate of 36.4% if we include discouraged work seekers. Moreover, unemployment is highest amongst young adults in the reproductive age group,*

with 49.5% of youth 20 – 24 years old not in employment, education or training”. Considering the above, advocating for and promoting a well-implemented urban agricultural system could go a long way to achieve sustainability in the country.

### 3.2.2 Presence of urban agriculture in South Africa

#### 3.2.2.1 The case of Johannesburg

The initiative, ‘Growth and Development Strategy 2040’, by the City of Johannesburg in its search to address the city’s food security challenges, has put urban agriculture at the core of its interventions (Korth et al., 2014: 2). While there is much to consider when conducting research on urban agriculture, due to lack of sufficient data, in South Africa this problem (of insufficient data) is at a higher level even though some effort at improvement has been made very recently. It is not easy to address urban agriculture practices in this country if one is conducting secondary data research due to a lack of sufficient, updated and convincing information.



*Figure 3.1: Illustration of FutureFarms SA garden/designs*

*Source: Vivier, 2018*

Although the motivation may not have come from the recent intervention adopted by the City of Johannesburg, the presence of some farms is showing that urban agriculture in Johannesburg is on the increase. In his article, Vivier (2018) argues that the opening of a third farm by the rooftop-based garden/farm in the heart of Johannesburg, *Future Farms SA*, may be a sign that urban farming in this city has a promising future. The author claims that rooftops of Johannesburg may indeed be unrecognisable in future due to plans to design and build more hydroponic rooftop farms, in accordance with an agreement between the City of Johannesburg and Future Farms SA (Vivier, 2018: 1).

*Urban Agriculture Initiative* is another project that aims to produce not only more food locally, but also provide more jobs for the youth by means of training them as entrepreneurs.

It was initiated by the Johannesburg Inner City Partnership with the support of the City of Johannesburg. At this moment the author claims, there are 22 young people who have already completed their training, and 25 who are still being trained from a group aged between 18 and 25. It is hoped they will become entrepreneurs in urban agriculture.

There are reports that more urban gardens are being created by this initiative (Davie, 2018), and these include Mr Nhlanhla Mpati's basil farm located on the rooftop of the building of the Chamber of Mines (Davie, 2018). Only time will tell whether these projects and initiatives will succeed. If they do, it could help solve problems related to food insecurity and climate change. It should be noted that the incubator and other stakeholders heading this initiative encourage property dealers to become involved as well, also as an attempt to build future houses with the gardening systems already installed.

### ***3.2.2.2 The case of Cape Town***

Examples from this city are characterised by overlapping efforts in the implementation of urban agricultural policy as well as efforts to deal with the challenges of climate change and socio-political environmental issues. Recently, the city has had to contend with a water crisis.

Information on some gardens being run by NGOs and other organisations are featured in the literature, but some of the information seems to be outdated. It is observed that some suburban supermarkets and the shelves of some local shops' are either full of dry or rotten vegetables and/or fruits, or they are empty. The researcher observed that at places such as the Bellville taxi rank, or the Cape Town and Wynberg train stations, especially during closing hours of business, you realise that the vendors at roadside stands are able to sell their fresh produce quite quickly.

The approach taken to examine urban agriculture and food security in Cape Town was informed by three factors:

- Firstly, the experience the researcher had in neighbourhood communities, through random conversations and visits, which revealed a missing element that would need separate research: The mixture of disappointment, a lack of interest as a result of either too little information, failed service delivery or regarding urban agriculture as “*dirty heavy work*” that can take time to yield results.

- Secondly, while initially trying to locate potential research subjects online in 2018, the researcher sampled one company in the Mother City, hoping to learn more of what was needed to know of Cape Town's urban agricultural practices. To the researcher's surprise, although their contact details are still online, the researcher could not find them in the building they claimed to have offices, nor ascertain if they had moved. A former partner in the same building in Cape Town's CBD also did not know where they were. When the researcher asked if the company had ever been there, the partner's answer was "yes". However, she said that they started noticing company partners vacating the parking lot one by one until none came back anymore. Word of mouth, she said, had it that they may have encountered challenges from the city management and subsequently dropped the initiative to embark on other individual businesses. The authenticity of this information could not be confirmed by the researcher.
- Thirdly, after visiting another community garden, this time in Oranjezicht, a suburb in Cape Town, the researcher reflected more on urban agricultural practices in Cape Town in relation to food security and poverty alleviation. Although it is a well-maintained garden, observations made by the researcher confirm that urban agriculture has many benefits to offer, but that depends on how well the individual is able to satisfy his or her different needs. It is a farm which was established on an abandoned site, and where much is happening in terms of edible plants, aromas, composting, recycling and social networks. However, it is a farm the researcher could not include in relation to the research objective stated in chapter one of this study (this is because, in the researcher's views, the type of garden in relation to actors involved and its location was not going to address the study's objective).

### ***\*Presence and types of urban agriculture in Cape Town***

This research uncovered unprecedented types of gardening projects emerging in the city. One such example is Ujamaa, started in Khayelitsha, on the outskirts of Cape Town by a group of young aspiring farmers who felt left out in terms of development projects in the city.

Under the name Ujamaa, a Swahili name adopted from Mwalimu Julius Nyerere's socialist ideology, this group wishes to identify any unoccupied place where it would be possible to

produce food. Referring to themselves as a 'collective of guerrilla gardeners', they aim to encourage everyone in impoverished communities to become self-sufficient and not depend on supermarkets any longer. The reason for this choice of name is reflected in statement below:

*“The garden is about promoting self-reliance and changing the profit mentality around food; it’s a microcosm of what society should be. If we fail to share the spinach in the garden, then there’s no hope for us to be able to share in the future. Putting a price tag on food is deciding who can eat and who can’t, and is therefore a form of oppression. It’s important to start with what’s available to you [like an underutilised piece of land] and see the gardening project as a way of protesting (against) increasing food prices” (Ujamaa Collective, 2017).*



**Figure 3.2: Illustration of Ujamaa guerrilla gardens in Khayelitsha**  
**Source: Ujamaa Facebook gallery & Hogg, 2017.**

The quote below is the Ujamaa Community Farm Motto:

*“You cannot carry out fundamental change without a certain amount of madness”*  
 – Thomas Sankara (Hogg, 2017).

There is evidence of food gardens, both on and off plot, across Cape Town. However, it is not easy to find them since urban agriculture is under-researched in the country. Most of the researchers have concentrated on the Cape Flats, home to most of the well-known generally NGO-based/led, community gardens (Olivier, 2015: 43-64; Philander & Karriem, 2015). These include Abalimi Bezekhaya, a well-known leading NGO, which has under its umbrella, Harvest of Hope, and others. There are also community gardens in Langa, on Kommetjie Neighbourhood Farm, Oranjezicht City Farm; the Herbs and Spicy organic farm in Franschhoek, and other ‘unrecorded’ or less well-known individual/small scale on or off-plot and open space gardens such as Mama Nomonde’s garden in Gugulethu and, of course,

the Ujamaa Guerilla Farms in Khayelitsha. These examples range from gardens providing food at subsistence level to ones that are commercially oriented.

Apart from the aforementioned, greater Cape Town is also home to Philippi's Horticulture Farms situated in a large horticulture and aquifer area on the Cape Flats. It finds itself amid much controversy as the City of Cape Town wishes to use part of the area for property development.

### ***\*Impacts of urban agriculture in Cape Town***

As stated previously, urban agriculture succeeds where there are policies and regulations that support the implementation of urban agriculture and include it in local ecosystems. In Cape Town, and generally in the rest of the country, the lack of adequate data, weak policies and continuous food insecurity suggest that more research about this sector is needed to draw proper conclusions. Based on Battersby's (2011: 1) argument and other research reports (South African Cities Network, 2015: 26; Krige, 2017 and Battersby *et al*, 2015: 4) and findings regarding Cape Town, it is clear that due to the neglect of urban agriculture and the low level of participation by poor households, there is scant evidence of the potential benefits of urban agriculture in food security and the subsequent alleviation of poverty.

### ***\*Actors and role-players in Cape Town's urban agriculture***

Role-players and stakeholders have shown to influence the outcome of urban agricultural practices. The presence of these role-players in guiding and supporting urban farmers bring about positive outcomes and success of urban agriculture while their absence or lack of support hinders this sector's progress. In addition, Battersby (2011: 1) claims that urban agriculture has been neglected, and that more research is required to understand the trends of this farming practice in South Africa. The author argues that issues of accessibility rather than simply '*availability*' must be taken into account by policies to address food insecurity adequately.

In addition, there is a low level of participation of poor households in urban agriculture which hampers the potential benefits of this practice to improve food security and alleviate poverty. Evidence of this was found in interviews conducted by the researcher in Cape Town.

### **3.3 HOW IS URBAN AGRICULTURE PERCEIVED BY LOCAL URBAN FARMERS**

#### **3.3.1 A representative case study: Face-to-face interviews**

As indicated throughout this study, this is secondary data research. Due to this research being conducted by using mainly information gathered by other previous researchers, and in search to add more credibility to the study, the researcher found it necessary to assess farmers' personal experiences that required complementary (face-to-face) interviews. However, due to challenges encountered in seeking participants and language barrier related challenges, the complementary studies were conducted among only three willing participants. Each of participants is a representative case of three categories (namely a low-income/ poor farmer, high-income-/ working-class farmer and a South African based prominent academic, researcher and activist) chosen by the researcher to gain different views on urban agriculture concerning food security challenges in South Africa specifically in Cape Town. The three different participants were chosen to include different social characteristics and their perceptions on urban agriculture and its contributions in relation to government policy making and implementation. This helped in ensuring an in-depth comprehension of the aspects of food security and the factors influencing the contribution of urban agriculture toward food security.

##### ***3.3.1.1 Interview with Participant A - individual farmer and an award winner***

While the researcher could present the outcomes of interviews differently, the researcher has decided to include some parts of the original responses to questions during the interviews because it will convey the meaning most clearly. In the researcher's views, the participant's expression gives a direct message leading to a better understanding without any possible biased interpretation in the researcher's views. The participant's own expression gives direct meaning leading to better understanding without any possible biased interpretation.

Participant A, with her medium-sized garden, has not only managed to secure permanent clients, but she is also a former award winner in the Western Cape Province. Today, this farmer is disappointed and frustrated because of false promises by policy makers and city management.

Fortunately, she is not hopeless to the point of abandoning her farming activities because of her passion for gardening, and the fact that it is already established. Although she willingly

provides information needed to conduct the research, she is also disappointed in those who were supposed to seal the cracks before the whole structure collapsed, namely the researchers. Participant A's view is that researchers gather information that should play a vital role in shaping policy making and strategy implementation but there is never visible outcomes.

Her biggest disappointment is that she has never heard or read of any policy that was drafted based on the information she may have been able to provide during interviews.

- **Asked about unemployment and the potential of urban agriculture to provide jobs and combat poverty, the following was part of her answer:**

“The only poverty in Africa is a failure to allocate resources. The only poverty we have is because they (the government) do not inject resources in us. When I say us, I mean the women or the men who are already involved in any sector” (Participant A).



*Figure 3.3: Illustration of the garden of Participant A. Source: Author, 2018*

Participant went on to claim that the local population did not have the ability to think ahead, but only to act when disaster strikes. An example she gave was how often local people (who are unemployed or are seasonal workers) refused to attend the workshops she conducts to train aspiring farmers because they would not be paid to attend.

Participant A also explained that she enjoyed being in this sector because it helped her to provide household needs as the main provider. Seeing her family healthy and her children in better schools confirmed that she had made the right decision to leave her teaching job.

- **When asked about the role of government in stimulating urban agriculture this was her response:**

“You know ... before, it was not like this before. It used to work well. It used to work and the City of Cape Town was always there for us ... they used to work with farmers regardless of their background or education, ... And .... Then” (Participant A).

The researcher wanted to know what had changed between now and the time when she was receiving support, to which participant A answered:

“Well...I think the difference is that the political book has been opened. Now we are allowed to talk, which I embrace ... but even if we are allowed to talk now, it feels like our politicians and our government, they don't listen to us. They have been coming to us now and again ... I think my interview ... it must be used in the proposal that will be used to make the policy ...”

“People are talking on the ground. *I never read any policy, you see that it was formulated with me or my colleagues!* You will read those bulletins ... They are talking about us, without us! So, that is why there are those who believe maybe it was much better before. But it was not better because they were serving a certain race of people”.

“All the researchers are coming on the ground, they are coming, to interview us about our projects, *where do they take these interviews? Are you just taking these things for your own PHDs, your own degrees?* Whereas, even those universities are being funded by our government! We still feel filth, really filth (in a friendly manner)”.

“For instance, if you check me, I am (an) award winner, we are plus minus six or seven women in the Western Cape, but when you check our background where we were before, our platform (where we have been operating), you will find us on the very same land, we are still operating on the same platform. Our provincial government does not work with our national level. From standard one you are taken to standard 8, then you graduate; but us ...we are just the faces of politics ...We are still on the same land, small piece of land! *What does that mean?* So, we don't want to be used as the face of progress. We must be an example, everything that was done with us, it must be implemented” (Participant A).

- **When enquiring about food security, Participant A stated:**

“It is politics ... they took hunger, they politicised it. You ... cannot tell someone, 'don't worry, you will get everything for free'. You cannot do that, you must tell the person, 'Come, I show you what to do, then I help you, but you will do it'; or at least say, 'Come, I meet you halfway! But no, in our South Africa, everything is free, free, what kind of government, is this? Is Sick’”! (Participant A).

### **3.3.1.2 Interview with Participant B**

In this short interview, the researcher wished to establish the motivation behind gardening in the backyard of one medium to higher income household. This was her response:

*“You know, apart from loving designing and doing my own things, I felt like I had to plant green leafy vegetables instead of filling my whole backyard with flowers. I love flowers and they are in the garden too, but the outcome is not the same. For example, since I planted I have never bought green leafy (vegetables) anymore. I gladly walk in the garden and pick them, wash them and eat without driving all the way to the supermarket to buy, let alone the queues on a shopping weekend” (Participant B)*

From the two interviews, the similarities are that the two participants enjoy gardening and they are both educated, although at different levels. While conducting the interview with Participant A, it came to light that more than 70% (figures given by Participant A) of the diet at her home consisted of vegetables. This choice of diet is in line with food security healthy fresh food, and this is the case for Participant B as well. It is also clear that they want to empower themselves, although not on the same level. The provision of fresh produce on their premises saves them from spending time and money unnecessarily for something that they are able to produce themselves.

### **3.3.1.3 Interview with Participant C**

In the interview with Participant C, a researcher at UCT who is concerned with food security issues, some key findings were:

The doctor (Participant C) is focussing on urban food security and food systems in cities that include Cape Town and not necessarily urban agriculture, although urban agriculture is part

of what she is focussing on. Participant C has conducted generous research and has numerous publications on urban agriculture.

According to her understanding, the trends in urban agriculture in Cape Town can be summarised as follows:

- Urban agriculture in South Africa is still under-researched, thus making it difficult to know what is really transpiring in this sector in the country.
- In her view the practice of urban agriculture in Cape Town is hampered by many factors. These include soil type, land access issues, water problems, lack of technical support and strategic interventions, inaccessibility of agricultural inputs for poor urban farmers, as well as resistance from young people who do not find the practice as appealing to uplift their livelihoods, making it difficult to fully explore the benefits of this practice.
- There used to be community outreach before to facilitate the practice of urban agriculture, but that outreach no longer takes place.

It was during the interview with Participant C that the researcher was able to obtain a reference to Participant A, who does not have any online presence, despite her claims during interviews that the researcher was not the first to approach her to conduct research. Participant C gave another reference to someone in the City of Cape Town, only to find out from participant A that the person (who apparently was very concerned with urban food insecurity in Cape Town, and advocated strongly for urban agriculture) was no longer employed there.

Participant A has the following views: The government provides unfulfilled promises. Participant C mentioned that government terminate helpful outreach programmes with no warning and without explanation. Participant A and C also indicated that there is constant shifting of government officials from one location to the next which is very disruptive for a sustainable relationship between people on ground level and government officials. It was surprising to confirm the dysfunctionality of government policies and regulations with regard to urban agriculture and food security strategies. For example, the updated reference she (Participant A) gave the researcher concerning the same employee of the City of Cape Town was not of much use as he/she had also been removed from the said department recently. The person whom the researcher spoke to was quick to suggest that the researcher enquires at the

department about who was in charge of the section/division under which urban agriculture operates, but the researcher never had a chance to do so. It was too complicated to speak to a government official in view of the limited time for the study. Thus, the claims regarding implementation of policy by participants are neither confirmed nor denied. Further research would be necessary.

### 3.4 SUMMARY

Taking into account what has been discussed in this chapter, one can conclude that urban agriculture in South Africa, especially in Cape Town,

- Is still a practice waiting to be discovered and acknowledged
- Is still misunderstood, also taking into account the lack of motivation on the part of the government. Hence, the conclusion that urban agriculture in South Africa is still far from achieving food security and alleviating poverty in growing townships or informal settlements.

Due to unclear government policies and the lack of participation by officials and other technical support in urban agricultural practices (at the exception of The City of Johannesburg's newly established initiatives), it has been found in this research that:

- The incorporation of urban agriculture into urban sustainability measures in South Africa still has a long way to go to progress and in that process, face numerous challenges.
- There is considerable neglect of this sector by government officials, thus making it clear that the link between urban agriculture, sustainable development and environmental management in general is not understood or is undermined. For this reason, it would be very difficult to reduce incidences of poverty among (urban) poor households and food insecurity challenges, nor would it be easy to motivate the urban poor to participate in urban agriculture.
- There might be a considerable number of urban poor farmers whose participation in urban agriculture is motivated by their passion for farming or their tradition (those who were practicing farming before they moved to cities). However, because of misunderstanding, lack of official support or unclear regulations, it is difficult to find their whereabouts. Some of them do not want to be found nor collaborate for fear of the consequences.

There was also the challenge of a language barrier during the study. This has led to challenges encountered in seeking the participants for interviews in the study. The participants chosen include a prominent known urban farmer, a passionate middle-class/ high income farmer and a prominent urban food security activist and academic researcher. Each one was chosen based on their knowledge, representativeness, availability and willingness to contribute to the study.

- Although it was pointed out that Cape Town residents (with the exception of big scale professional farmers and a small number of passionate farmers) do not have farming as part of their culture, the type of soil, water shortage and a lack of technical support make it difficult for urban agriculture to be explored.
- The educational and youth development opportunities generated by urban agriculture, for example, learning about how to produce food, biodiversity, and possible career paths, are almost non-existent, particularly in Cape Town due to a lack of interest.
- It is difficult to draw conclusive decisions on the trends of urban agriculture in South Africa.

As mentioned, urban agriculture is being promoted worldwide, including Cape Town, as a means to reduce food insecurity, especially for poor urban households. However, verbal and paper-based promotion of the practice without including implementation, monitoring and evaluation strategies means it is as good as absent.

Consensus among researchers regarding urbanisation in South Africa is that it is only expected to increase. This will impose a huge burden on the management of cities, and among the challenges they will have to deal with is urban food insecurity, which will require innovative solutions.

## **CHAPTER FOUR: RESEARCH METHODOLOGY AND DESIGN**

### **4.1 INTRODUCTION**

In the previous two chapters, the relationship between the practice of urban agriculture and sustainable development has been discussed. Data and information from diverse sources were considered. The summary of findings was mentioned. In this chapter, the methodological perspective and process used in the study is provided. The research purpose, research question, research design and methods used to collect research data are also defined. Due to the nature of the research topic, where human understandings, settings and views have to be studied and interpreted in a way to answer research questions, this study has used the interpretative method among the three dimensions of epistemology (Scotland, 2012: 12; Hofer.& Pintrich, 1997: 88- 140). It is in this chapter also that the measurement of the validity and reliability of data will be discussed. Moreover, this chapter presents the data analysis and its interpretation. In concluding the chapter, strengths and limitations of the study are given.

### **4.2 RESEARCH PURPOSE**

The main purpose of this study is to expand knowledge. To determine the research purpose, the researcher has to identify the type of study. The research can be quantitative and/or qualitative; it can be exploratory, descriptive and/or explanatory; and it can also be basic or applied research. According to Jaeger (1997), quantitative research first seeks to predict, and then control. It measures and evaluates data to generalise results and findings for the study population. It is numerical and tests hypotheses. On the other hand, qualitative research, by means of description and identification of similarities and differences between data, seeks to understand the phenomenon and then predict. It is theoretical; data are acquired through field research, for example.

It has been argued that an exploratory study is preferred and more useful when there is not sufficient information about the phenomenon. It can serve to provide, with the initial data, a theoretical view, especially when the researcher has a view about something and seeks to understand it better. In the researcher's view, urban agriculture is a sector that could

contribute towards poverty alleviation and tackling problems related to food insecurity (caused by a lack of, or insufficient, or unhealthy food) if it is well promoted and implemented. For conclusive details, the researcher is of the view that it was necessary to explore different case studies that would allow for comparative analysis.

This research was designed to be conducted as an *exploratory study*. This is because, even if various researchers have covered a wide range of urban agricultural practices and their contributions to food security, very few have addressed urban agriculture in a comparative analysis at a global level regarding its current contribution to urban food security, urban poverty alleviation, education and youth development, community capacity-building and empowerment, resilience, sustainable livelihoods, and sustainable development in general. It was in relation to these key concepts that this study was conducted. It tries to answer the question “*what*”.

On the other hand, this study is also descriptive because by means of a critical literature review of case studies in cities across the world, it seeks to provide information about the problem. It is useful when addressing questions such as “*how, what, who, when and where*”. These questions have been dealt with in this study. Descriptive research is considered to provide more detailed information compared to an exploratory study. Here the researcher explores and explains while providing additional information at the same time. Descriptive research builds on exploratory study and requires a large amount of data (Fox & Bayat, 2007: 45; Dudovskiy, 2018).

Moreover, the study is explanatory because it attempts to connect various ideas from different sources in the search to understand different cause-effect relationships. This study is, therefore, exploratory and descriptive, and also seeks to answer the question “*why*”. This kind of research also attempts to explain the relationships between variables (Dudovskiy, 2018).

### **4.3 RESEARCH METHODOLOGY**

There are two main approaches in social science research, namely qualitative and quantitative. This research study followed a qualitative approach, allowing for an exploration of aspects of urban agriculture which, in turn, allowed for a description of the findings.

According to Creswell (2009: 121-123), through qualitative research, it is possible to describe, analyse and interpret events where their quality and meanings are brought forth for analysis. It aims at discovering, understanding and describing meanings. Qualitative research allows the researcher to use existing and historical research data in the study. This is more appropriate because secondary data analysis is used as the main method of study.

## **4.4 RESEARCH DESIGN AND METHODS**

### **4.4.1 Research problem**

In the elaboration of the research process, the first step is to formulate the research question. This allows the researcher to remain focussed in his or her investigation (Welman *et al.*, 2005: 12-13). Although a research question may be elaborated on before embarking on the research process, it is possible that the question will change in the process due to new developments or information on the research topic. For this, Eisenhardt (1989: 536) advises researchers to identify the key concepts that will guide them in their study. In this research study, the key concepts include food security, urban agriculture, community capacity-building, resilience, education and youth development opportunities, empowerment, sustainable livelihoods and sustainable development. From here, questions were compiled which this study sought to answer.

The researcher sought to answer the following main question:

- What is the potential and actual role of urban agriculture with regard to improving food security and reducing poverty within poor urban households?

Addressing this question involved the following related questions that this study also aimed to explore:

- What is urban agriculture?
- Who participates in urban agriculture and why?
- How is urban agriculture linked to sustainable development?
- How is urban agriculture helping to reduce the incidence of poverty in poor urban households in low and middle-income countries?
- What is the link between urban agriculture and environmental management?
- What are the trends of urban agriculture in South Africa? And Cape Town?

## **4.4.2 Research design and data collection**

### **4.4.2.1 Research design**

The research design is a combination of plans and procedures followed in the process of gathering, analysing and interpreting data in the search to address the research question. A mainly qualitative literature review was conducted for this study, and this makes this research effort a secondary data study.

### **4.4.2.2 Collection of data**

This study was conducted by means of data collected from different cases of urban agricultural practices in different countries. The main data used was previously collected and analysed by other researchers. This researcher conducted the study by reviewing the data (such as studies, discussions, publications, documentaries, reports, and so on) that were initially generated and communicated by different scholars, private and public organisations such as governments, social media channels and commercial companies, to mention a few.

In addition, the researcher conducted face-to-face, one-on-one interviews to obtain a more experiential and personal point of view (of interviewees) before any conclusion is drawn. Creswell (2014: 12-14) has stated that the description of individual lived experiences by the researcher in interviews offers more impetus to the research findings and discussions. As discussed in the previous chapter, Cape Town urban farmers are mostly unknown due to the limited availability of data. Some of them are not willing to participate. Face-to-face interviews were conducted with participants who were willing and available and who, in the view of the researcher, constituted a representative case even if they were a very small number compared to what was needed for the complementary interviews. This philosophical inquiry is found in what is known as a phenomenological research design, one of qualitative design. Thus, this research, by using interviews, was designed as phenomenological research.

According to Onwugbuzie and Weinbaum (2017), there are three phases, comprising seven steps, in which the literature review is performed. The three phases and their seven steps are as follows:

- *Exploration phase*: comprises the first five steps:
  1. The exploration of topics and beliefs
  2. The initiation of the search for information
  3. The storage and organisation of obtained information

4. The selection and deselection of information
5. The expansion of search where other modes such as observations, media, documents, experts and secondary data are included
  - *Interpretation phase:* Consisting of
6. The analysis and syntheses of information
  - *Communication phase:* Consists of
7. The presentation of the report (Onwugbuzie & Weinbaum (2017: 56).

Research design is done in the following four stages:

- ***Formulate the research topic:*** What is urban agriculture and its contribution to addressing food security and poverty issues?
- ***Define the research question:*** The formulation of the research question is necessary for the researcher to be able to deal with it by means of existing data. Formulating the research question first guides the search of data which in turn is used to answer the research question.
- ***Specify the data files/find sources for data:*** In this study, a literature review in relation to the research question(s) and objectives was carried out. Attention was paid to the date of primary data collection to give preference to recent research findings and publications (research conducted in the recent decade constituted the majority); the authors were experts who covered topics on urban agriculture and its relation to food security and poverty alleviation. It should be noted that every possible source was used to avoid the possibility of missing the latest useful or important information. Thus, sources such as newspapers, both online and printed copies, verbal conversations, YouTube videos, blogs, television, and so on were all used to search for and collect data. In addition, similar topics and related studies by other authors were also explored. The researcher also collaborated closely with the Stellenbosch University library staff who assisted to draw international references, mostly up-to-date journal articles.
- ***Collection and comparison of data:*** Data collected were evaluated in relation to applicability to the current study, that is, consideration of the purpose of the original (primary) study; targeted study population; who collected the data/source of the data; the information that was collected; when it was collected (for example, survey data

could have been collected many years before it was published) and the methodology used. The similarity between different authors (consistence) was established.

- **Analyse the data and write a report:** Is it qualitative or quantitative data, or both?

According to Mouton (2001: 179), research designs have four dimensions:

**Dimension 1:** research is either *empirical* or *non-empirical*

- an empirical research study is experimental or observational
- non-empirical research study is theoretical, for example, the use of a literature review.

**Dimension 2:** This concerns whether the research is primary/new or if it is based on the analysis of already existing data (secondary data)

**Dimension 3:** This is about the type of data, whether it is numeric or textual

**Dimension 4:** This concerns the control of variables. Those variables that do not have to change (remained the same) are controlled variables. This is done to minimise their effects.

#### 4.4.2.2.1 *Secondary data research method: Different case studies from different countries*

This research has collected and analysed secondary data. That is, the researcher used mostly and reviewed critically existing data (previously collected, analysed and interpreted by someone else) to report findings. The secondary data thus refers to data that are already available in a data set and can be reviewed and analysed by either the same primary researcher or another researcher, such as is the case in the present study.

For this type of study, the data has to be chosen carefully according to the research purpose and analysed (by the present researcher) to reach better conclusions. To do so, the researcher has to compare the data from different sources to identify credibility and validity; those data found to be inauthentic or irrelevant have to be ruled out. Thus, the researcher has to pay attention to aspects such as the source of the data (the individual who had collected the data before), the time the data was collected or recorded (some data might be outdated or invalid), and check that primary data are in line with the purpose, question and objectives of the current research (Surbhi, 2017).

Secondary data consists of two main types:

- those data that are gathered within the researcher's organisation such as computer-based databases or reports from former researchers; these are known as *internal secondary data*.
- those data that are not within the researcher's organisation and which concerns the information that was gathered outside the researcher's organisation, known as *external secondary data*.

According to Heaton (2008: 33-45), there are two types of pre-existing qualitative data that are used in social science research namely:

- *non-naturalistic data* such as observations and filed notes (asked by the researcher); the methodology used for these data is secondary analysis and
- *naturalistic data* such as autobiographies, photographs, social interaction (less or no participation by the researcher); the methodology used for these data is either documentary or conversational analysis.

Based on the explanation above, this study has used non-naturalistic pre-existing qualitative data and the analysis used by the researcher is qualitative secondary analysis.

- Representative cases were chosen from North America, Latin America and the Caribbean, Asia and Africa. In North America, urban farming activities from Canada were studied using the example of the collective/community gardens of Montréal as the major one. With regard to Canada, different cases were selected to represent open space/vacant place, community-based, commercially based and high tech gardening activities.
- In Latin America, cases from Mexico and Brazil were chosen to represent a variety of urban farming activities. From community, rooftop, backyard, open space, rural-urban or peri-urban gardens, with farmers from all works of life, this research has described current trends of urban agriculture in those countries.
- In the Caribbean, Cuba was chosen to represent city-based organic agricultural practices that were launched to bring the country's economy back on track.
- In Asia, cases from Chinese and Japanese mega-cities, as well as Singapore, were chosen to gain a more general idea of urban farming activities around the world, but

above all the choice was made based on the fact that these countries are searching to achieve food security by producing their own food, even in the skyscrapers, thus typical urban farming. In addition, inspirational cases were found in the study, cases that are being adopted in large cities elsewhere in the world. The case from India was included because of the already overpopulated urban areas there, and because a variety of urban agricultural features can be found in India. From struggling poor urban farmers to those who boast successful farms on terraces and rooftop gardens, India offers more insights with regard to what is transpiring in the world of poor urban farmers.

- In Africa, cases from North and Sub-Saharan Africa were chosen. The case from Egypt is an attempt in North Africa to achieve food security through not only a government initiative to halt the sale of land to promote the growth of the agricultural sector, but also by establishing the means to farm in harsh climatic conditions and desert areas. The cases in Sub-Saharan Africa were from Kenya, Uganda, Zambia, Zimbabwe and South Africa. These cases were chosen based on the state of the cities in these countries, their level of economic development, growing urbanisation, and projected climatic conditions.

#### *4.4.2.2 Complementary Interviews*

The interviews were conducted in Cape Town with two private farmers/gardeners (one based in a low-income suburb and the other a working, middle-class to high income individual) and a prominent Cape Town academic, researcher and activist in urban food security. The selection of interviewees was based on where they lived, their knowledge and their participation in urban agriculture. The academic is not involved in urban agriculture as a farmer, but as a researcher and activist concerned with food insecurity issues, especially in urban areas.

The choice of multiple sources was guided by the desire and need to gather information to give more credibility to the study.

#### 4.5 DATA ANALYSIS

This study has used qualitative secondary data analysis. According to Heaton (2008: 33-45) there are six types of qualitative secondary analysis, namely:

- *supra analysis*: Seeks to explore new research questions (exceeds the primary study).
- *supplementary analysis*: Seeks to explore new research questions (in-depth analysis of a certain feature of primary data)
- *re-analysis*: Seeks to re-explore a new research question of a primary study (it is said, by the author, to exceed the primary study, or the in-depth analysis of a primary study's feature)
- *amplified analysis*: Seeks to explore new research questions (*exceeds the primary study or in-depth analysis of a primary study's feature*)
- *Assorted/complementary analysis*: Seeks to explore new research questions or provide validity to an ongoing primary study (exceeds the primary study or in-depth analysis of a primary study's feature)
- *alternative analysis*: Seeks to re-explore research questions of a primary study (exceeds the primary study or in-depth analysis of a primary study's feature).

The three modes of secondary analysis are namely:

- *formal data sharing*: provided by the primary researcher, for example, and these can be obtained through *general data archives or commercial companies*.
- *informal data sharing*: provided by the *primary researcher*, for example, and these can be obtained through the *primary researcher's personal data collections*.
- *Personal/inside data secondary analysis*: provided by an organisation and can be obtained through *in-house records of the organisation* (Heaton, 2008: 33-45).

Based on the aforementioned, this study has followed a qualitative alternative analysis as a type of secondary qualitative analysis and used formal data sharing as a mode of secondary analysis. This is because the study sought to re-explore research question(s)/problems addressed before in selected primary studies (the contribution of urban agriculture towards food security and poverty alleviation among the urban poor). In addition, different cities have varying features to offer with regard to the same problems (more or less common in different cities). For this, an analysis of data was conducted by addressing the question from a different

angle, which allow a comparison between the cases to reveal accurate and enriched information on trends, which in the end lead to better conclusions and recommendations.

The latter was done by including less explored features of urban agriculture, such as the farming activities of megacities and the acknowledgment of poverty, or at least low income, in most, if not all, urban areas. In addition, food insecurity is not only about a lack of, or insufficient, food, but it also comprises unhealthy eating habits. These include habits that are causing some preventable, non-contagious health problems, such as obesity and diabetes.

In brief, urban agricultural practices in each case was analysed in relation to:

- its benefits for food security;
- urban poverty alleviation and employment generation;
- income provision;
- youth development and education opportunities (their participation and the benefits to them);
- community capacity-building and resilience;
- sustainability;
- in relation to its challenges and constraints such as policy issues, land tenure, agricultural inputs, risks;
- driving forces (purpose and cause)
- its integration and regulation into urban ecosystems.

## **4.6 STRENGTHS AND LIMITATIONS**

Various research methods are used to conduct research, and each has its strengths and limitations. A list of these is provided below according to the methods used in this study.

### **4.6.1 Secondary data**

#### **\*Strengths:**

- it is readily available;
- it is cheaper compared to primary data gathering

- the researcher is less involved in the process of collecting the data, thus the gathering of data is not as time-consuming as for the primary data;
- offers information onto the efficacy of existing data

Linking these strengths to this study, the use of secondary data was more appropriate in relation to the topic and objectives. The reason for this is that there is limited data available on urban agriculture, especially in under and developing countries, and it would have been challenging, costly and time-consuming for the researcher to travel the world searching for appropriate cases studies that would have allowed for a comparable analysis such as the one used in this study.

**\*Limitations:**

- data may be limited in relation to the purpose of the present research;
- comparisons may be limited if geographical settings are not comparable;
- there are limited ways to analyse data;
- some data may be outdated and cannot be used to reflect accurately the present situation;
- not one's own work, hence the new researcher is expected to review and analyse critically the quality and applicability to the present research purpose and objective.

Regarding the limitations, this study was limited in a way that the researcher had to rely on other previously conducted research by others. Not every objective in this study was addressed without searching for a generous number of case studies beforehand. Hence, the cases were chosen according to the research questions, objectives, date and purpose of primary study. This is to achieve validity and promote reliability of data.

#### **4.6.2 Case studies**

**\*Strengths**

It has been argued that not only does a case study permit the researcher to investigate the phenomenon within its context, it also allows the use of multiple cases of evidence, thereby facilitating triangulation. By using case study design, a comparative analysis is possible.

In this study, a generous number of cases studies were chosen to allow for a comparable analysis. Although the choice of case studies was not an easy task due to different settings,

cases were chosen based on the meaning of what is meant by a 'city' or 'urban area', availability of data, the presence of urban agricultural practices, the claims regarding food insecurity worldwide, and in relation to the questions and objectives of the study. Thus, the conclusions were drawn based on similarities and consistency to better allow for a comparative analysis.

For example, the researcher assessed at elements such as actors in urban agriculture (who participated in urban agriculture and why?), views on links to food security and poverty alleviation, views on regulating and implementing policies, as well as the integration of urban agriculture into urban ecosystems/sustainability. Various sources were combined in the study, allowing the easy use of already existing data which in turn assisted in the use of triangulation, thus adding more value to this research and to its recommendations.

Moreover, Seawright & Gerring (2008: 300) argue that a case study is usually the point of departure to better understand a much larger case than the initial case itself. Also, it has been argued that case studies not only have the ability to achieve the validity of concepts, thus allowing for the testing of hypotheses and the development of theory, they also allow for dealing with complexity stemming from the nature of relationships. Additionally, they help in dealing with complicated and changing events and phenomenon, such as those influenced by innovative ideas, such as those often found in urban agriculture (Crowe *et al.*, 2011: 1-8).

### **\*Limitations**

One point of criticism is that it is not possible to generalise data to a larger population. Thus, the ideal is to collect the data in longitudinal cases. It has also been argued that some of the cases are not classified as scientific. Added to this is that the data may not be easy to use to establish cause-effect relationships (Crowe *et al.*, 2011: 1-8).

The use of case studies limited the current study because not only do the settings differ, but the researcher also had to rely on someone else's choices; the cases studied in a secondary data study were not accessible to the researcher for participatory research, for example. On the other hand, to allow better understanding of current trends of urban agriculture in connection with innovations and new adaptations, the researcher had recourse to the other source of data such as social media (television news, Facebook, newspapers and YouTube).

This was done in attempt to gain updated information, but these types of data are not classified as scientific and are sometimes deemed unreliable.

### **4.6.3 Face-to-face interviews**

#### **\*Strengths**

- Research interviews bring forth more personal experiences and the points of view of research participants, thus adding value to the study findings and discussion.
- Face-to-face interviews allow the researcher to detect the reactions and nature of expressions by participants, which can help in judging the credibility of information.
- Interviews can reveal extra, hidden or otherwise neglected information.

In relation to this study, although the sample is very small compared to what could have been covered, the views of interviewees added more value to the study findings (from case studies) because they enhanced the analysis of reasons behind certain findings. For example, the lack of participation, the frustration of committed farmers and/or loss of interest in urban agriculture by the urban poor, especially the youth, could be as a result of the lack of information, neglect and lack of technical support from stakeholders or unfavourable policies by government officials and policy makers.

#### **\*Limitations**

- Face-to-face interviews can lead to biased information. This happens when the participant feels intimidated by the researcher, misjudges the researcher's intentions, or is not fully interested in the topic and decides to respond poorly or negatively. Answers can be exaggerated to impress the researcher, or can be superficial, thus having less value.

Overall, this research was strengthened by the availability of a generous number of case studies and updated information. It was limited in terms of data collection due to the fact that it is secondary data analysis-based research. Urban agriculture is a complex topic with different definitions and settings. Thus, there are many different views to consider, different stories to tell and researchers do not have the same intentions in their research, nor do they

ask the same questions. Nevertheless, consistency was established. Some of the dimensions of urban agriculture were found in different contexts (what is true in one place is often also true in another setting).

#### **4.7 SUMMARY**

This chapter addressed research methodology and processes followed by the researcher. The research purpose, research question, research design, methods, and research analysis used in collecting and analysing data are provided in this chapter. It was also discussed that this research study, being qualitative in nature, is an exploratory, descriptive and explanatory secondary study. This is because, although urban agriculture is a well-researched topic, few researchers have addressed it in a comparative analysis at a global level while detailing its contribution to urban food security and urban poverty alleviation in settings seeking current solutions. A literature review was conducted on a generous amount of data from cases in various countries to allow for a better comparison and an accurate conclusion. For this, different methods and techniques were used to allow for a critical study, which has been provided.

Regarding complementary face-to-face interviews, three different participants were chosen to include different social characteristics, their perceptions on urban agriculture and its contributions in relation to government policy making and implementation. Thus the researcher intended to not only gain an in-depth comprehension of the economic and social aspects of food security at household level but also the identification of the factors influencing the success/ positive contribution of urban agriculture toward food security and poverty alleviation within South Africa, Cape Town in particular.

As addressed in this study, urban agriculture is a very complex topic with ever-changing and innovative ideas within different settings. It has been stated in this study that socio-economic and environmental challenges are enormous throughout the world and their negative impacts in less developed countries are of a particular attention. Taking into account these challenges while assessing the contribution of urban agriculture to food insecurity and poverty alleviation, especially within urban areas amidst current global urbanisation challenge, suggests that various cases and differentiated methods be used in order to collect enough information allowing to draw better conclusions. It is in this way that the researcher has

chosen to seek any available meaningful information that could add to answer the research questions.

By means of formal data sharing (available data in the dataset), alternative analysis became necessary to re-explore the research problem. The chapter concluded with strengths and limitations in relation to this research study.

## **CHAPTER FIVE: PRESENTATION OF RESULTS AND DISCUSSION**

### **5.1 INTRODUCTION**

This study seeks to identify and discuss the current trends in urban agriculture research, as well as to identify the gaps in research conducted on this topic. The researcher endeavoured to identify the role of urban agriculture in contributing to food security and poverty alleviation among the urban poor in cases used in research studies. This study also sought to identify the reason for the lack of, or little participation in, urban agriculture by vulnerable urban poor and the youth as it emerged in preliminary literature reviews. This chapter seeks to present the study results and discuss the findings according to the research purpose, questions and objectives as previously defined and presented.

### **5.2 RESEARCH PURPOSE AND OBJECTIVES**

In terms of objectives, this research aimed to address the gap in knowledge about urban agriculture, its feasibility, and provide evidence for interested and concerned entities such as policy makers, activists, institutions and members of the international community on the costs and benefits of urban agriculture for the urban poor, especially in under and developing countries such as South Africa.

The specific objectives of this study included an assessment of the way in which urban agriculture is incorporated into urban sustainability measures in South Africa, the manner in which urban agriculture is able to address food security and help reduce poverty in urban poor households, and the way in which urban agriculture is conceived by the urban dwellers of Cape Town.

### **5.3 PRESENTATION OF RESULTS**

Regarding definitions of urban agriculture, this study has found that they differ, or are complex, depending on the context. To understand what could be defined as ‘urban agriculture’, it is necessary to understand first what is meant by the term. Also, it is interpreted differently (Parnell & Walawege, 2011: 16). This study has found that a

commonly used definition of urban agriculture is the one by Mougeot (2000), as provided and motivated in chapter two of this study.

To gain insights into contemporary urban agricultural practices, different cities in different countries with differing contexts were considered. Although representative cases within countries were chosen, the choice of countries was deliberate. This was done in consideration of different elements such as the meaning of what is a ‘city or urban area’ and the availability of data, as has been previously mentioned in chapter four.

### *Different case studies*

As mentioned above, this study was mainly conducted through the critical review of the data obtained from different case studies from various countries.

The cases referred to in this study are:

#### ❖ *Cases from North America*

In North America, cases from Canada and the United States of America were chosen.

In Canada, the representative case was of community gardens – generally in open spaces and known as the collective gardens of Montréal. Although these gardens are said to differ and produce independently of each other, they have been found to have a common objective of combating food insecurity, and educating and empowering economically disadvantaged urban dwellers.

Not only do they contribute in feeding the hungry (through emergency kitchens, for example), the collective gardens of Montréal also offer an example of success as a result of cooperation and co-management between the government and the community. This example of the combined efforts between municipalities, stakeholders and community members has shown that urban agriculture offers much more by progressing from being gardens to promote food security to becoming social development projects, such as youth sports projects.

In the United States, the chosen cases included *Gangster Gardener*, street- and open space-based gardens founded by Ron Finley, an individual who tried to change the lives of local residents after being fed-up with the food insecurity in his Los Angeles neighbourhood.

The case of Ron Finley confirmed the need to address food security challenges even in developed countries such as USA, where obesity is also understood as a form of food insecurity that needs to be addressed through people growing their own healthy food, whether or not arable land is available. The use of open spaces instead of purchasing the land for farming also shows that urban poverty can be found anywhere, even though it might be on different levels.

In addition, some experimental gardens in this country were also chosen because they involved the use of scientific research to improve the results from urban agricultural practices. This case was chosen based on the constraints encountered and the criticism of urban agriculture today.

The aim of this choice is to show a different scenario where the need to address global food security challenges and the role of urban agriculture starts to draw the attention of the scientific community and a collaboration of efforts to achieve better results in the future. This example, together with the emerging hi-tech farms, have shown that using science-based research and innovations to improve the results obtained from urban agricultural inputs could help to increase employment and lead to the acknowledgement of the contribution of urban agriculture to sustainable development by especially policy makers and the youth. In some countries, the youth are turning to urban agriculture to develop alternative careers.

Moreover, high-tech vertical farms have been found to be spreading across the two aforementioned countries, as is the case in the megacities of China and Japan, as well as Singapore. These types of urban agriculture, although still mostly accessible to high-income (city) farmers, are also starting to show up in under and developing countries as they seek to address challenges generated by land degradation, climate change and a lack of land tenure.

#### ❖ *Cases from Latin America and the Caribbean*

In Latin America and the Caribbean, cases were from:

In Brazil, the locations of gardening include the favelas, Rio de Janeiro's very dense urban areas, where there is no space for recreation, let alone gardening. However, this has not stopped the residents from engaging in urban agriculture. Urban agriculture in these locations is adapted to the architecture of the area, where the gardens are either on rooftop terraces, or vertical on walls. This practice not only shows that soilless food production is possible, but

also that urban agriculture has the potential to uplift lives, and that gardening on walls is not only an aesthetic, an example of greening, or represent the need to connect with nature.

Rio de Janeiro is said to have shown success, but unlike similar cases, this success has been facilitated by the participation of stakeholders in the progress of urban farmers. These stakeholders include NGOs and the City of Rio de Janeiro by way of facilitating inputs, sharing information and providing training. Also, the Women's Development Bank has added an important input, namely money, which is usually a major barrier to many aspiring poor urban farmers, especially women. Rio de Janeiro is one of the few cities with initiatives aimed specifically at women active in urban agriculture. This is exceptional, as women are usually the ones who bear the brunt of most of the challenges in farming.

Then there is the city of Belém, one of Brazil's poverty ravaged cities, which has more agricultural space. In this city, the majority of urban farmers are natural medicine practitioners, thus creating the possibility that urban agriculture can also offer solutions for public health issues, especially in developing countries. If not through creating remedies, at least it can contribute to the prevention and treatment of naturally treatable diseases and infections. It has been argued that urban agriculture in this city is a remarkable success, especially in terms of the large harvests achieved on small spaces, where about a quarter of the city's food is being produced in backyards, as well as through stakeholder-farmer connections. However, in this city, urban agriculture has to compete with property developments. This is shown by the struggle between inner city urban farmers and policy makers, who favour commercial development projects over food production.

In Mexico, in the country's capital, Mexico City, various types of farming, from mostly educational to therapeutic, to community capacity building gardens are present. It is argued that the city is successful in urban agriculture not only because it is one of the Latin American cities that exports higher quantities of the produce from urban agriculture, but also because it has representatives in the ranks of the Latin American Urban Agriculture Research Network. Another example of the recognition of urban agriculture's potential is not only shown by this example, but also that through farming practices where urban farmers reclaim and re-establish their highly regarded socio-economic and cultural values lost through modernism and colonisation.

Cuba has a unique history when it comes to urban agriculture. Much like Uganda, this pioneer country in urban agriculture offers an example of how urban agriculture acts as a tool for sustainable development. From economic shutdown to becoming an exemplary organic farming country, Cuba has shown that innovative thinking is needed in the time of global warming and environmental degradation, which is caused by, among other things, industrialisation, and search for the means to reverse the excessive extraction of natural resources and allow the re-establishment of natural abilities to sustain life.

#### ❖ *Cases from Europe*

Cases in Europe were chosen from:

Germany, in the search to identify trends in urban agriculture, ten Berlin food gardens were referred to.. There are several hundreds of them in this city. These gardens offer different benefits to the city's sustainability regarding food security, greening of the city, education, social cohesion and enhancing biodiversity (including beekeeping) by using mainly movable planting containers or boxes. Importantly, these gardens offer proof of the city's efforts to merge development projects and sustainable living.

United Kingdom, in London, there is a tendency to favour high income/business-oriented farms, and this leads to the under-prioritisation of urban agricultural practices among low-income and poor urban dwellers. Nevertheless, the case from this country presents an interesting feature in the advancement of urban agriculture, especially in the search to accommodate the urban poor's needs in terms of food security. Cambridgeshire-based urban gardening, by means of community supported networks, allows for the establishment of a new defined economy. Through grassroots community empowerment and capacity-building projects Cambridge CropShare, a community supported agricultural network, is a typical example of success resulting from locals combining their efforts to face economic challenges. By operating at grassroots, these community-supported networks allow urban farmers to keep most of the benefits generated by their harvests, facilitate knowledge and produce exchange, thus allowing more trade and renewed marketing in urban agriculture. One of the major challenges of urban agriculture is the lack of, or poor, marketing strategies for its produce.

#### ❖ *Case studies from Asia*

Case studies chosen from China, Japan and India include, but are not limited to the megacities.

In China, Singapore, and Japan; urban farming in the megacities displays a similar model, namely high-tech or mostly commercially oriented farms. Most of the farmers here are high-income and/or educated entrepreneurs, and are relatively young. Although normal urban farming activities (wherever there is space) is not excluded in these Asian megacities, high-tech farms operate on a different level. These highly adapted farming activities not only show that farming in cities is possible, but they also provide another reason to review urban planning policies for urban sustainability. In general, the urban farms in these cities are multifunctional, thanks to the collaboration and co-production between the managers and officials of these cities and farmers. There is a similar example in Mexico, although not at the same level of technology and collaboration.

Another interesting feature of urban agriculture is found in Tokyo, Japan, where not only vegetable gardens can be spotted on any floor of its skyscrapers, but also animal husbandry.

In Singapore, officials and stakeholders are also working together to promote urban agriculture. In an effort to increase locally produced food and promote healthy eating, aspiring farmers in Singapore are not only given seeds to start their farming activities, but they are also encouraged by “community edible gardeners’ competitions” that are held regularly, where cash is among the prizes to be won.

In India, unlike the aforementioned examples, most farmers are still practicing a mix of moderately advanced, and traditional and high-risk urban farming. This is a model found between developed and/or developing countries (mostly rooftop and terrace-based community gardens) and traditional, high-risk ones such as the model found in under-developed countries (gardens based on land on open spaces, river banks and claimed dumping sites) with all of the attendant challenges. The latter include farms and gardens that are viewed as illegal with the possibility of their crops being removed at any time, as well as facing the high risk of theft and crop contamination.

#### ❖ *Cases from Africa*

Cases that were chosen from the continent are in Egypt, Kenya, Uganda, Zambia, Zimbabwe and South Africa; the latter, specifically Cape Town, offer extremes in urban agricultural practices. In general, urban farming activities in these countries share a similar model, with the exception of Uganda and South Africa. The only part of Sub-Saharan that is showing

progress in this regard, with flexible and supportive public policy, although there are still challenges with land scarcity, is East Africa, specifically Uganda (Conway, 2006: 1-4).

In Egypt, change is occurring after a time of economic hardship. In spite of it being positioned well in relation to the Nile River and its banks, negligence of agricultural development coupled with climate change, among others, have landed this once giant farming country in an economic crisis. However, since 2015 efforts have been made to change matters, using innovative, high-tech urban agricultural production methods, and also through the government's efforts prohibiting citizens from selling their farms. Among other things, the *Do not sell your land* initiatives and several others, including providing training that is designed to encourage farmers to remain in agriculture, are showing signs of a promising future for urban agriculture in Egypt.

In Kenya, lately, many people in cities, including the capital Nairobi, are embarking on urban agriculture, not only to subsist, but also for entrepreneurial/business reasons. These practices are motivated in part by the land being degraded, forcing people to look for alternative means to produce food. Another reason is the increasing market created through emerging supermarkets for urban farmed produce.

The research conducted by Onyango et al. (2017: 231-239) has found the farmers to value more the food they produce themselves for household food security as opposed to buying food. Although these farmers have to deal with several challenges, including a lack of clean water for irrigation which poses a high risk of food contamination, households engaged in farming activities were found to be better off in terms of food security compared to those who are not participating in farming. Despite challenges, urban agriculture in Kenya is showing progress in the examples of emerging high-tech farms. The urban poor are still hampered by not only a lack of arable land and unfavourable weather, but also by not being able to afford the services and the installation of farming infrastructure of emerging game-changers such as Ukulima Tech.

Uganda has shown that it is possible to farm in a city and that through well-implemented urban agriculture, sustainable development can be achieved in African cities. From being a means to an end since the country's economy collapsed in the 1970s to becoming an example where more employment is created, urban agriculture in the capital, Kampala, is becoming

more business oriented and also provides alternative career paths. In Kampala, not only highly qualified and professional people such as the public health Dr Diana Nsubuga are venturing into this sector, but also young (graduates) are exploring this sector to build careers. Nevertheless, despite the city's efforts to regulate urban agriculture, land tenure and competition for land in the city is still hampering some of the urban dwellers, especially women.

Zambia is another example of where government policies, above all else, are preventing this sector from progressing faster. Ndola, once the main manufacturing city in the Zambian Copper Belt before the drop in the price of copper followed by the privatisation of companies by the government, has shown that urban agriculture is undoubtedly one of the alternative means for people to survive, contributing to their self-reliance. Not only livelihoods were improved, but Ndola's urban agriculture may be able to progress faster. There is business-oriented investment potential in and around Ndola where rising incomes among urban farmers has been reported lately.

However, although already regarded as a successful sector, urban agriculture in Zambia is not different from other African cases in terms of challenges that urban farmers have to endure. Depending on the type of farming activity, type of produce and area of production, the major challenges are a shortage of unaffordable fertilisers, a lack of knowledge about crops and livestock diseases, pests, the unavailability of water and inaccessibility to seeds, and the unfavourable laws and restrictive regulations implemented by municipal officials. These challenges are the source of income difference between peri-urban and intra-urban farmers, with the former earning less compared to their counterparts in the city.

Zimbabwe suffers from the effects of an economic crisis. Urban agriculture has a long way to go to being recognised as a productive sector, even though there is slow progress.

There is evidence that urban agriculture is contributing towards food security and poverty alleviation in the main cities and towns, even though there are many challenges. These include a scarcity of arable land and water, unfavourable government policies, the destruction of planted crops due to unlawful claims by officials, overlapping or unclear and controversial environmental policies, expensive permit charges, favouritism in allocating (urban farming) land, as well as a prohibition on the use of open spaces as farms and gardens, and the country's harsh climate.

## South Africa

### *Complementary interviews*

As previously addressed in chapter 3, interviews took place face-to-face with three participants in Cape Town. While conducting interviews, the researcher discovered the following:

- There was a mix of sentiments with regard to government officials and policy: there is a tendency to quit due to a lack of involvement by officials – the involvement varies from being limited to nothing at all.
- It was realised during interviews that urban farming was not really part of the food culture in Cape Town. Those who have a tendency to establish gardens are motivated mainly by passion.
- There is a tendency to view urban farming as “dirty, energy-consuming work” with the added inconvenience of having to wait long periods for harvests, compared to daily odd jobs, even if they may not be permanent.
- One farmer, a former teacher by profession, blames the government for favouring “laziness” by making empty promises of “free” service delivery without considering how they would provide for everyone in a non-productive society.

Through the example she mentioned, it would appear that local people seem to find value only in immediate earnings and do not think long-term. This was confirmed in her claim that despite her efforts to find ways to help her neighbours establish their own small gardens (although only a few had responded positively), they asked to be paid before attending any training workshop or demonstration on her small farm. Another concern she had highlighted was that the youth do not show any courage or willingness to work. This was confirmed in another interview with Participant C, an activist and researcher in urban food security.

### *\*Urban agricultural practices from case studies were analysed according to:*

- **Location**
  - Peri-urban: In general, large scale are favoured, controlled by land tenure policies. However, these projects proved to be less productive in less-developed or climate challenged countries. There are also risks of food contamination, with numerous types of farming found in Africa, Mexico and India.

- Urban or intra-city, on plot/small scale: these are found in backyards, rooftops, terraces and on walls, or may consist of high-tech models in any location among the aforementioned cases. It may also include container planting. The high-tech modes of farming are usually dominated by educated, higher income farmers, commercial or alternative diet-seeking initiatives.
- There are high-technology oriented farms in China, Japan and Singapore.
- There are well-integrated organic farms in Cuba; community gardens in North America (Canada and the USA), Europe (mostly in Germany), and elsewhere but at different levels of integration in urban sustainability.
- Rural-urban: both a mix of modern/traditional and/or cultural farming activities are found mostly in Latin America and India.
- African urban farming encompasses all types of farming in a more isolated way, or less directive manner.

- **Actors participating in urban agriculture**

People who participate in urban agriculture are generally from all walks of life, but some general characteristics can be observed in the following cases:

- Both middle income and the poor urban and mostly women participants, especially single mothers in the case of Africa, Latin America and India. The purpose of their participation is mainly food security, but also surplus trade for extra income.
- Average to high income participants; usually have commercial/business purposes for their activities. These farmers can be found in all of the countries considered, with more cases in China, the United Kingdom, Japan and Singapore.
- Participants who are intellectuals and regard it as a career: they can be found everywhere, especially in Asia and East Africa. These are the areas where aspiring youths are starting to engage with urban agriculture as a profession.
- Members of government organisations, many volunteers and activists: they are generally found in community gardens/farms in Canada, Singapore, Mexico, Germany, China and South Africa. The South African case is different because there is no evidence of participation by the government. There is also

a lack of clarity regarding policies in terms of environmental, development and economic agendas.

- **Drivers of urban agriculture:** they tend to represent the following reasons:
  - Social: mostly driven by poverty and hunger (to ensure access to food), lack of income but also to ensure a diversified diet (switch to organic due to health reasons)
  - Economic: those who produce for the market or to trade
  - Environmental: ecological, greening of cities and biodiversity
  - Psychological: the need for social connection to avoid loneliness or to keep themselves busy
  - Aesthetic reasons

- **Type/purpose of urban agriculture**

Generally, for food, economic, surplus sale, trade/commercial and as a hobby (good for sustainability, wish to participate), social connection, community development and networking.

- **Support for farmers/training/information provision**

The governments of Cuba, Canada, Singapore, China, Japan, Uganda, Mexico and Brazil play a more or less tolerant role. Zimbabwe, with the exception of some support in Bulawayo, is less tolerant. South Africa displays, with the exception of some established NGOs and a newly implemented initiative in Johannesburg, a huge indifference despite elaborate policies.

- **Inputs**

Overall, the same as in the aforementioned support category, with the exception of Singapore, Uganda and Mexico. Cuba is a champion. In South Africa, with the exception of recent initiatives by the City of Johannesburg, official involvement by the state seems non-existent.

- **Land tenure**

This is the largest challenge everywhere for intra-urban farming, with the exception of Canada and Japan. Sub-Saharan Africa is much hampered in this regard. Development projects, especially property development in inner cities, are preferred to farming activities.

Mexico City has space and support, but there is overlapping coordination and integration of cultural, ecological and economic dimensions. Uganda has welcomed urban agriculture, but a lack of land for farmers, especially women, remains a challenge.

- **Policy and regulations**

Urban agriculture is misunderstood by urban planners and policy makers who fail to recognise the reality of food insecurity, climate change and land degradation; urban poverty amidst increasing urbanisation, and the mismatch between environmental, economic and socio-development dimensions of sustainability. Some countries have excelled in terms of recognition, incorporation and promotion of urban agriculture as part of a holistic urban ecosystem. They include Cuba, Singapore, China, Canada, Japan, Germany, Mexico, Brazil and Uganda. Unfortunately, countries where urban agriculture is needed more to address poverty and food insecurity, such as Zimbabwe and South Africa, are the ones in which officials, policies and regulatory bodies still lag behind in understanding the role of this sector.

In South Africa, with the exception of recent initiatives by the City of Johannesburg, state involvement seems to be non-existent with some outdated policies still in existence. This research has found that the main reason for the failure of these policies lies in the overlapping strategies in allocating responsibilities and implementation by poorly enabled departments (unqualified staff, fighting over ownership of responsibility, a silo approach to planning and poor coordination). The principles of collaborative, co-produced planning partnerships are neither appreciated by the policy makers.

Overall, development agendas enjoy preference to urban agriculture, with the exception of a small number of countries, such as Mexico, where a culturally conservative mindset still prevails.

## **5.4 DISCUSSION**

Urban agriculture has existed for many years and is undoubtedly here to stay. It has been impacting on cities positively and will continue to do so. Among the case studies considered

in this study are examples of more advanced and/or high-tech oriented agricultural practices, and these were chosen for two reasons.

*Firstly:* Urbanisation is expanding worldwide, not only in terms of size but also with regard to architecture and related challenges. An increasing number of cities are struggling with land scarcity for farming activities. In order to adapt to the architectures, policies and food supply demands in cities, farmers across the world, including Africa, are adopting innovative agricultural systems that can help to produce more food without compromising the cities' development needs.

*Secondly:* This study aimed at assessing the contribution of urban agriculture in ensuring food security, alleviating urban poverty and contributing to sustainable development. In this regard, the inclusion of more advanced urban agricultural practices in the cases studies was not simply motivated by the fact that one is talking about *urban* farming activities, but also because these highly advanced practices are showing a tendency to spread, creating the impression that they may be the main characteristic of urban agriculture in future. However, this study has found that these modes of food production are still in the hands of high-income farmers.

Chapter two dealt with trends of urban agriculture in different countries and accurate findings have to be made by considering the relevance of updated information. Following a literature review, this study found that there is a tendency, depending on the region and climatic conditions, to practice all forms of urban agriculture, whether peri-urban or inner city, backyards, rooftop, home/on plot, vertical, small-scale/off plot, as well as larger scale farming by using land, terrace, and high-tech.

Moreover, different authors would have it that the issues related to food insecurity tend to be a general concern in many cities. This is because food insecurity is not simply reflected in the lack, or insufficiency, of food, but also in unhealthy eating habits which lead to complications such as obesity. These claims have been confirmed in this research as the study found that most urban farmers, specifically in developed countries, engaged in urban agriculture in search of healthier food. There is a tendency to avoid chemically treated food products. Even those who engage in commercially oriented farming do so because there is a demand for organic fresh food. An example of this is found in the United Kingdom-based City Farm and

*Grow Up Urban Farms*, an aquaponics farm, where the produce is unaffordable for poor and low income residents of London.

Participants in urban food production do so in response of their food needs. Even though in some countries participation in urban agriculture can be interpreted as a hobby, the urban poor participate in urban farming to diversify their diets and gain access to healthy food that otherwise would be inaccessible or unaffordable to them.

The provision of sufficient healthy food is becoming a huge challenge, especially in underdeveloped countries. A number of urban dwellers in these countries in particular, although they are not the only ones, engage in urban agriculture to improve their livelihoods.

Education, available information, access to finances and purpose also seem to influence the adoption of the farming system to be used. Without compromising or ignoring the presence and importance of land-based urban agriculture (open space, vacant plots – whether rented out, bought, or just taken occupation of – as well as former dumping sites), such as community and institutional gardens, this study concentrated on current features of urban agriculture to draw conclusions according to the research question(s) and objectives.

In brief, this study has found and confirmed that:

- Urban agriculture is not new. Although the development of this sector has gone through stages in different contexts, it has been argued that food gardens for crop production were included in urban landscapes and these aimed at ‘defending’ cities, the prevention of food shortages as well as developing resilience in difficult times such as drought.
- The practice of urban agriculture is being motivated by a growing unemployment rate, increased poverty, and the growth of urbanisation which cause the search for alternative production means to accommodate and satisfy the ever changing demands of cities, especially food demands.
- In countries such as Cuba and Uganda, urban agriculture has become a means to overcome food shortage after an economic collapse. However, while urban poverty is a reality in developing countries, this study has found that urban food insecurity (unhealthy, lack of or insufficient food) appears to be a global phenomenon. The

practices of urban agriculture in higher income countries are being driven by the search to switch to diets of organic food and to satisfy psycho-social and ecological needs. They tend to be more community or business oriented.

- Challenges such as a lack of adequate infrastructure and the means to facilitate transportation of the produce to the point of sale, marketing and purchase of produce, especially in under- and developing countries, were pointed out as they hinder the development of urban agriculture.
- There is a tendency to associate agriculture with rural areas only and it is considered unfit for the city by some policy makers. This hampers the development of urban agriculture because favourable policies and regulations are key to the success of urban agriculture.

## **5.5 SUMMARY**

In summary, this study has found that urban farming activities take place in all the cities presented as case studies. With the exception of Uganda and Egypt, African government officials display resistance, intolerance, ambiguity, or are simply unknowledgeable when it comes to regulating urban agriculture and incorporating it into urban ecosystems. This has been hampering the development of urban agriculture in Africa, despite the fact that it has been practiced for many years.

In relation to the definition of urban agriculture, this study has found that the definitions differ or are more complex, depending on the context.

Urban agricultural practices are changing. There is a tendency to adopt small land and/or soil-less gardens due to land tenure problems, a barrier that has to be overcome. In general, peri-urban gardens and farms are associated with traditional practices with lower harvests, especially where soil degradation and weather conditions are not favourable, which is the case in most parts of Africa. It is interesting to note that this type of farming is still tolerated by officials, especially in under and developing countries, because it does not conflict so much with development projects.

In relation to the main purpose of this study, namely the assessment of the role of urban agriculture in contributing to sustainable development by providing for food security and alleviating poverty, this study has found that urban agriculture has much to offer than mere food production.

This study has found that urban agriculture has and continues to contribute to the provision of food (for those who practice it) and also to improve diets by having less, or no chemically contaminated, fresh food available. It may not be able to completely change the economic situation of households as this depends on the size and model of the farming practice versus the number of members and needs in the household. It has also been found that some communities, who become more interconnected through farming and the trade of produce, also use other trading strategies such as exchanges.

## **CHAPTER SIX: CONCLUDING REMARKS AND RECOMMENDATIONS**

### **6.1 INTRODUCTION**

As stated in chapters one, four and five, this study aimed to identify and assess the role of urban agriculture in contributing to food security and poverty alleviation among poor urban people. Moreover, it also attempted to identify the reason(s) behind the lack of, or scant participation in urban agriculture by the same poor people who could otherwise benefit, and in so doing, achieve sustainable means that are crucial for a viable future.

Covered in chapters one, two and three, various authors argue that due to increasing urbanisation, (urban) food insecurity and rising food prices, urban agriculture is regarded as one of the proposed solutions to the urban food crisis and it has gradually been finding its niche over the last few decades. Although not so much in cities, but in rural areas, ensuring food security and providing access to healthy food is one of the most pressing issues that needs attention currently.

Urban dwellers depend on purchased food and the accessibility and affordability of these are crucial. On the other hand, growing urbanisation brings with it high levels of urban poverty. The latter, paired with high food prices, creates more difficulty for poor urban people to have access to and afford food through the formal food supply systems. Considering these challenges, together with the high prevalence of unemployment, particularly among the youth, especially in Sub-Saharan Africa, including South Africa, food insecurity is a harsh reality in many cities today.

Based on the aforementioned, the researcher wished to identify the role that urban agriculture can play in contributing to food security and the alleviation of poverty in urban areas, specifically amongst poor urban households. The study as indicated in chapters one, four and five, sought to answer the following question:

- What is the potential and actual role of urban agriculture in improving food security and reducing poverty in poor urban households?

Answers to this question can be found in the following paragraphs.

## 6.2 RESEARCH: CONCLUDING REMARKS

This study has found that, regardless of fluctuating trends around urban agriculture, the latter offers a contribution to food security and alleviating or minimising consequences of poverty even if the figures may not be that convincing. Unless city planners and government policy makers link economic, socio-development and environmental needs, sustainability is unlikely to be achieved.

This study has found that urban agriculture, if it is well-implemented and farmers are fully supported via co-produced planning regimes, contributes to the aforementioned sustainable development dimensions in many ways. Examples have been covered in chapter two and are found in countries such as Cuba, Singapore, Uganda, Canada, Singapore, Mexico and Egypt. However, failing to recognise this contribution and its inclusion in sustainable development initiatives can hamper the progress of this practice, especially in underdeveloped and developing countries. The setbacks in urban agricultural practices as a result of the lack of its recognition and its inclusion in sustainable development initiatives such as cases from Zimbabwe, South Africa and Zambia have been addressed in this study.

It is ironic that governments espouse the willingness to create jobs, yet they cannot consider initiatives in urban agriculture, which would provide food requiring substantially less investment than other initiatives. The example is in chapter three of this study, where it was found that millions of Rand and efforts spent on social welfare are managing to eradicate neither urban poverty nor food insecurity in South Africa (persistence of cases of stunting of children, hunger in urban poor households).

Every effort to provide employment should also be aimed at providing people with the necessary resources to help them to sustain their lives. Of all the resources required, (healthy) food is essential. According to the researcher's understanding, sustainable life means a maintained life and one cannot maintain it if there is a lack of food. However, one should not just consume anything merely for the sake of it because unhealthy eating habits can contribute to health problems. This is exemplified in non-communicable diseases such as diabetes, high blood pressure and obesity and other forms of malnutrition. This is due to lack of healthy food, but above all to the inability to afford it. In cities where people rely on purchased food, the poor suffer a double burden due to a lack of sufficient funds as it has been stated in this study.

Urban agriculture can contribute to a reduction in the chances of contracting these diseases, but above all, it contributes to the prevention of their causes by minimising the poisonous chemicals with which food produced normally are treated, such as the recent cases of listeriosis in South Africa.

Moreover, urban agriculture contributes to the provision of food for those who are facing challenges because as urbanisation grows, it is likely that urban poverty will increase, especially in developing countries. Urban agriculture also helps with the greening of urban areas, and providing fresh food in close proximity; it combats pollution because lengthy journeys in transporting and to obtain food are avoided, thus reducing the impact of emissions.

Moreover, as covered in chapters two and three, urban agriculture helps in mitigating soil degradation and climate challenges by producing foods with less effort and pollutants (fewer or no pesticides are used and the soil has time to regenerate for future production). Urban agriculture is also found to contribute to the psychological well-being and education of farmers. It makes them feel useful, through farming, new social support networks are formed, social costs are reduced and new learning opportunities are provided. This argument has been covered in chapter two: farmers and/or aspiring farmers are inspired and encouraged by innovative and/or successful examples of agriculture, which helps them to continue, change and/or embark on new farming practices. This is found in the examples of aspiring farmers, including young graduates, who explore urban agriculture as a career in Uganda as well as the spreading of hi-tech farms for commercial purposes.

Persistent efforts by poor urban people to farm or garden despite the risk of losing their crops or being punished by officials because they do not have permission or the necessary permits to farm, (such as urban poor farmers of India, Zambia and Zimbabwe as stated in chapter two), raise at least two issues:

- first – urban farmers embark on these activities because they know that, despite the difficulties, they will have more reward if all goes well;
- second – urban farmers embark on these activities because they have no other alternatives, whether the farming practice is difficult, risky or possibly unsuccessful

(not sufficient harvest, for instance). This is the only way they have of providing for their families.

In this study, mention has been made that:

- Even if urban agriculture contributes to the alleviation of urban poverty and food insecurity; those who should benefit more are still suffering the ordeal. Apart from boosting and recommending unaffordable modes of farming practices such as high-tech, hydroponics, rooftop, terrace, and so on, as if they are the only suitable urban structures, it is disturbing that policy makers and urban planners still ignore the reality of townships and slums which are the homes to millions of hungry citizens.
- Apart from unfavourable laws and policies, the lack of designated urban planting and gardening spaces, coupled with the unavailability of open-space gardens for those who do not have roofs nor backyards, are making it even more difficult for poor urban people who are trying their best to escape poverty.
- Appointing the wrongly or poorly qualified officials in the departments that deal with important matters, such as those related to urban planning, food insecurity, unemployment and climate change, can only exacerbate matters. In this regard, two typical Sub-Saharan African countries present a confirming, or at least informative enough, example as covered in chapters two and three.
- **Zimbabwe:** In spite of the deep economic crisis the country still finds itself in, there is still resistance to implement policies that will help promote urban agriculture.
- **South Africa:** Little effort is being made to narrow or eliminate the large socio-economic gap as reflected not only in the fact that over half of the country's youth is unemployed (as stated in chapter three), but also that more than a quarter of poor urban people in the agricultural representative province (the Western Cape) go to bed hungry. Although the researcher recognises the limitations of this study in terms of empirical evidence, at least the results from a number of research efforts on the projections of climate change in this country should have triggered some action by government by now. It is in this respect that more critical research efforts are recommended.
- Urban agriculture in Zambia, although regarded as already a successful sector, is hindered by different challenges that urban (poor) farmers have to endure and, above all, by unfavourable laws and restrictive policies. This is not only the Zambian case

but overall urban poor farmers find it difficult to overcome challenges encountered in urban agricultural practices addressed in this study.

- One of the major challenges of urban agriculture is the lack of, or poor marketing strategies and transportation for its produce. This is mostly found in countries where the lack of technical support from government officials and stakeholders is prominent.
- In countries where urban agriculture is needed more to address (urban ) poverty and food insecurity, such as Zimbabwe, South Africa, and Zambia officials, policies and regulatory bodies still lag behind in understanding the role of this sector.

Overall, this study has found that urban agriculture contributes to food security, alleviation of poverty and ultimately sustainable development but for this to happen this sector has to be recognised and well-implemented and urban farmers, especially poor farmers, have to be fully supported by government officials and stakeholders in mutually beneficiary co-produced planning regimes.

The following section, in the search to maximise the contribution of urban agriculture towards poverty alleviation, food security and sustainable development, offers further recommended considerations for the sector.

### **6.3 RECOMMENDATIONS**

It has been found in this study that urban agriculture is one of the solutions needed to avert food insecurity and poverty related issues among urban poor households. However, urban agriculture is also unlikely to succeed in this challenge unless proper attention is paid to the following recommendations, as individual considerations, but also in combination:

- Rather than searching to respond to crisis, governments, especially in Africa, should search for means to strategically respond to changing urban needs. Growing urbanisation leads to increased urban food needs. In order to cope with (future) urban food requirements, it is vital that government officials equip themselves with a holistic understanding of the sector, with strategies and systems that would enable to feed the increasingly urban populations. Thus, adequate short and longer term policies are needed, especially in Africa, to protect urban and peri-urban agricultural lands; land rights as well as urban agricultural livelihoods for the poor. As a planning priority such an approach will entail a holistic approach to local contexts, as well as

inter-disciplinary planning: policy makers and strategists need to integrate perspectives from development economics; agriculture; community development and other fields. In this mix of foci it is essential that urban agriculturalists -the main beneficiaries- should occupy the central point of departure for planning, for policy making and capacity building, ensuring sustainable development. In such a collaborative community and expert (insider/ outsider) co-production process, it is not only the technical knowledge of professionals which are prioritised, but rather and mainly, the local, meaning-giving social capital and indigenous knowledge regimes of urban agriculturalists. Unfortunately such a “planning marriage” is often not appreciated by policy makers and planners.

- In terms of urban agriculture in relation to urbanisation, socio-economic crises (such as hunger, migration, food insecurity, unemployment and increasing poverty), development agendas (such as increasing urban infrastructure needs) and environmental issues (such as climate change, drought, floods, pollution, and so on), at least two aspects require attention:
  - Urban planners and policy makers should bear in mind the effects of growing urbanisation and the needs of urban dwellers, and plan accordingly. They should work with different entities, including property developers, to reserve and license gardening spaces.
  - Effective rural service delivery and empowerment from the grassroots must be ensured to avert internal migration and stress on cities. It is necessary that qualified government officials work with local residents to develop and implement context-specific policies: keep the local residents informed and ensure authentic community participation, if for no other reason (as has been argued on different occasions) because they understand their socio-economic contexts best.
- Land access and land tenure security, technical support and information are of a great concern for the urban poor. In order to enhance the economic viability and productivity of urban farming, the important step should be that governments recognise the importance of and incorporate urban agriculture in urban land use. They equally need to ensure access to information, support, land, water, and training for urban farmers (for example establishment and support of urban farmers associations/ organisations; technical advice and farmers training on farming products, health and

environmental risks associated with farming activities; providing credits; and so forth). Spending thousands on elaborate policies and regulations without close collaboration and community participation of directly affected beneficiaries would be a waste of time. For example, as was stated in chapter three, it is difficult to conclude on the lack of participation of the urban poor in urban agriculture in Cape Town. The lack of community participation could be a result of a lack of knowledge on how to garden on a small scale or soilless (need of training), lack of information on what the policy permits (inaccessible information on the City's views, support and plans), or lack of support (they want to farm but have no inputs such as seeds, compost, tools).

- It is crucial that departments and systems be merged to ensure an understanding of how systems are linked so that better solutions are achieved. Here it is rather important, as stated above, that urban agriculturists closely collaborate with (urban) governments; international agencies; NGOs/NPOs; local business; activist groups and universities.
- It is imperative that the youth and women be placed at the core of all development agendas and that they be included in decision making. A way this could be done is to develop a strategy to involve young graduates in government offices that deal with agriculture-related matters.
- Efforts should be made by officials to collaborate with the right people, specifically researchers, to remain up to date on developments and avoid crises as much as possible. It is essential that government officials/ leaders and policy makers understand and pay attention to the link between socio-economic, economic and environmental needs to achieve sustainability.

For example, seeking to deal with climate change should not only reflect measures related to weather pattern information, but also to possible future threats related to hunger and food insecurity, increase in internal migration which could lead to more slums, more diseases, more demands in medicines and medicine production, more pollution, more crimes, more social welfare, more economic crises, more social conflicts, and so forth.

One the other hand, the information in regard to up to date social phenomenon, related assumptions as well as future projections are always found in ongoing research. Information and training and capacity building is the key.

- Keep the situation under close and engaged assessment. It is more likely for a project to be implemented successfully and sustained if there are follow-ups, monitoring and evaluation, which allow for necessary improvements. Efforts should be made by officials in considering, understanding and adequately implementing different research results that are aimed at making positive changes.

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## ANNEXURE

### NOTICE OF APPROVAL



### NOTICE OF APPROVAL

#### REC Humanities New Application Form

21 August 2018

Project number: 6773

Project Title: The Contribution of urban agriculture to sustainable development: Potential role of urban agriculture to improving food security and reducing poverty

Dear Mrs Esperance Siborurema

Your REC Humanities New Application Form submitted on 12 July 2018 was reviewed and approved by the REC: Humanities.

Please note the following for your approved submission:

#### **Ethics approval period:**

<b>Protocol approval date (Humanities)</b>	<b>Protocol expiration date (Humanities)</b>
21 August 2018	20 August 2021

#### **GENERAL COMMENTS:**

**The REC questions the proposed sample size of 200; however, it appears that if the researcher does not reach this, or saturation occurs earlier, it will not take away from the validity of the method. The researcher is cautioned to keep very close to the proposed interview themes.**

Please take note of the General Investigator Responsibilities attached to this letter. You may commence with your research after complying fully with these guidelines.

**If the researcher deviates in any way from the proposal approved by the REC: Humanities, the researcher must notify the REC of these changes.**

Please use your SU project number (6773) on any documents or correspondence with the REC concerning your project.

Please note that the REC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

#### **FOR CONTINUATION OF PROJECTS AFTER REC APPROVAL PERIOD**

Please note that a progress report should be submitted to the Research Ethics Committee: Humanities before the approval period has expired if a continuation of ethics approval is required. The Committee will then consider the continuation of the project for a further year (if necessary)

#### **Included Documents:**

<b>Document Type</b>	<b>File Name</b>	<b>Date</b>	<b>Version</b>
Request permission	for RESEARCH INTRODUCTION LETTER FROM SUPERVISOR	20/03/2018	
Default	Fran Fredricks	11/04/2018	
Informed Consent Form	SU HUMANITIES Informed Consent _Written	05/07/2018	
Data collection tool	Questionnaire-QUALITATIVE-Structured interview questions for focus group	05/07/2018	
Data collection tool	INDIVIDUAL INTERVIEW QUESTIONS FOR FARMERS	05/07/2018	
Default	MPhil proposal final draft-2018	05/07/2018	
Data collection tool	QUESTIONNAIRE- SURVEY RESEARCH questions	05/07/2018	

If you have any questions or need further help, please contact the REC office at [cgraham@sun.ac.za](mailto:cgraham@sun.ac.za).

Sincerely,

Clarissa Graham

REC Coordinator: Research Ethics Committee: Human Research (Humanities)

*National Health Research Ethics Committee (NHREC) registration number: REC-050411-032.*

*The Research Ethics Committee: Humanities complies with the SA National Health Act No.61 2003 as it pertains to health research. In addition, this committee abides by the ethical norms and principles for research established by the Declaration of Helsinki (2013) and the Department of Health Guidelines for Ethical Research:*

*Principles Structures and Processes (2<sup>nd</sup> Ed.) 2015. Annually a number of projects may be selected randomly for an external audit.*

## Investigator Responsibilities

### Protection of Human Research Participants

Some of the general responsibilities investigators have when conducting research involving human participants are listed below:

**1. Conducting the Research.** You are responsible for making sure that the research is conducted according to the REC approved research protocol. You are also responsible for the actions of all your co-investigators and research staff involved with this research. You must also ensure that the research is conducted within the standards of your field of research.

**2. Participant Enrollment.** You may not recruit or enroll participants prior to the REC approval date or after the expiration date of REC approval. All recruitment materials for any form of media must be approved by the REC prior to their use.

**3. Informed Consent.** You are responsible for obtaining and documenting effective informed consent using **only** the REC-approved consent documents/process, and for ensuring that no human participants are involved in research prior to obtaining their informed consent. Please give all participants copies of the signed informed consent documents. Keep the originals in your secured research files for at least five (5) years.

**4. Continuing Review.** The REC must review and approve all REC-approved research proposals at intervals appropriate to the degree of risk but not less than once per year. There is **no grace period**. Prior to the date on which the REC approval of the research expires, **it is your responsibility to submit the progress report in a timely fashion to ensure a lapse in REC approval does not occur**. If REC approval of your research lapses, you must stop new participant enrollment, and contact the REC office immediately.

**5. Amendments and Changes.** If you wish to amend or change any aspect of your research (such as research design, interventions or procedures, participant population, informed consent document, instruments, surveys or recruiting material), you must submit the amendment to the REC for review using the current

Amendment Form. You **may not initiate** any amendments or changes to your research without first obtaining written REC review and approval. The **only exception** is when it is necessary to eliminate apparent immediate hazards to participants and the REC should be immediately informed of this necessity.

**6. Adverse or Unanticipated Events.** Any serious adverse events, participant complaints, and all unanticipated problems that involve risks to participants or others, as well as any research related injuries, occurring at this institution or at other performance sites must be reported to Malene Fouche within **five (5) days** of discovery of the incident. You must also report any instances of serious or continuing problems, or non-compliance with the RECs requirements for protecting human research participants. The only exception to this policy is that the death of a research participant must be reported in accordance with the Stellenbosch University Research Ethics Committee Standard Operating Procedures. All reportable events should be submitted to the REC using the Serious Adverse Event Report Form.

**7. Research Record Keeping.** You must keep the following research related records, at a minimum, in a secure location for a minimum of five years: the REC approved research proposal and all amendments; all informed consent documents; recruiting materials; Continuing review reports; adverse or unanticipated events; and all correspondence from the REC.

**8. Provision of Counselling or emergency support.** When a dedicated counsellor or psychologist provides support to a participant without prior REC review and approval, to the extent permitted by law, such activities will not be recognised as research nor the data used in support of research. Such cases should be indicated in the progress report or final report.

**9. Final reports.** When you have completed (no further participant enrollment, interactions or interventions) or stopped work on your research, you must submit a Final Report to the REC.

**10. On-Site Evaluations, Inspections, or Audits.** If you are notified that your research will be reviewed or audited by the sponsor or any other external agency or any internal group, you must inform the REC immediately of the impending audit/evaluation