URBAN FARMING IN NAIROBI:
UNDERSTANDING THE IMPACT OF CAPACITY BUILDING ON FEMALE FARMERS

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ABSTRACT

The growth of cities places urbanization as one of the 21st century's most significant global trends. As urban populations in sub-Saharan Africa increase so do food insecurities. One long-term strategy used by households to improve access to nutritional food is to practice urban agriculture. This raises the question of what the impact might be on cities if urban farmers were better supported through training. This issue is important for women who play a strong role in urban farming. The central goals of this study are to analyze and evaluate the impact of urban agriculture based training on individual women. This study was informed by primary and secondary data. The findings are the result of in-depth qualitative research in Nairobi, Kenya. The research reveals that the urban agriculture training is having a positive impact on female participants. Recommendations to further enhance the impact of training on the female participants are discussed.

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CHAPTER ONE: INTRODUCTION

A historic milestone was recently achieved when the global population of urban dwellers reached the 50 per cent mark, making urban centres the dominant habitat for humans on the planet (United Nations Population Fund, 2007). Globally, urban growth is influenced by a number of factors including the reclassification and expansion of urban periphery due to changing definitions of cities, rural to urban migration and natural urban population increase. It is estimated that roughly 60 per cent of population growth in medium (sized) cities in middle to lower income countries is due to natural increase (Potts, 2010). The remaining 40 per cent is attributed to net rural-urban migration and the reclassification of rural settlements as urban (Potts, 2010). The extraordinary growth of cities makes urbanization one of the 21st century's most significant global social trends. Concerns stem from urban expansion converting green space and good quality agricultural land into development zones; increased water and air pollution, and, a serious waste-disposal problem for cities (Koc et al., 1999). More employment opportunities are demanded and if a city cannot absorb the swell than direct economic and social impacts are incurred and poverty becomes more prevalent (Koc et al., 1999).

Presently, urban populations in sub-Saharan Africa are still growing and in many cases rapidly. According to urban scholar Deborah Potts, if countries in sub-Saharan Africa are to stimulate and sustain a rapid and economically favourable urbanization, they will require enormous investment in industries which collectively employ hundreds or thousands of low-skilled people (Potts, 2010). In Africa, rural poverty levels remain high; however, when higher living costs in cities are factored in, the gap between rural and urban living standards narrows sharply, revealing significant hardships despite the seeming advantages of improved

infrastructure and more accessible social services (Prain, 2010). One particular difficulty faced by individuals trapped in the cycle of poverty is acquiring adequate healthy food. Food insecurity undermines a person's ability to learn, work and make progress in other areas of their life placing them at a disadvantage (Mougeot, 1999).

Food security has always been a key concern for least developed countries (LDCs). The United Nation's Food and Agriculture Organization (FAO) (2009), defines food security as "a situation that exists when all people at all times have physical, social and economic access to sufficient, safe and nutritious food to meet dietary needs and food preferences for an active and healthy life". This definition suggests that food security involves three central elements: availability, accessibility and affordability, with affordability and accessibility being the most important (Lang & Barling, 2012). The Ryerson Centre for Studies in Food Security (CSFS) expands this interpretation by stating that there are five elements contributing to food security. Availability and accessibility as common axis points to the FAO's definition; however, adding adequacy, acceptability and agency. Adequacy being defined as sufficient food for all people at all times; acceptability being understood as access to culturally acceptable food, which is produced and obtained in ways that do not compromise people's dignity, self-respect or human rights; and lastly, agency which pertains to the policies and processes that enable the achievement of food security (Ryerson Centre for Studies in Food Security, 2015). This particular interpretation emphasizes that food security in not simple or inclusive; but complex and requires a wide range of approaches to very diverse problems. As food systems struggle to keep up with the demands of urban growth, steady supplies of perishable and fresh produce become harder and more expensive to acquire (Dubbeling, 2010). This makes adequately feeding urban citizens a major concern in developing countries.

The aforementioned challenges for low-income dwellers force them to seek low cost solutions to access food. One long-term strategy used by households to improve access to nutritional food is to practice urban agriculture, which "contributes additional food for household consumption as well as releasing cash that would otherwise be used for food for other purchases needed in the household economy" (Prain, 2010, pg. 3). In most literature, urban agriculture is defined as the growing of food crops and fruit trees as well as the raising of animals (Prain, 2010, pg. 6). Urban agriculture occurs in backyards, along roadsides, rivers and railways, and in parks and industrial areas. As urban growth continues throughout Africa, relatively large areas of peri-urban land – the peripheral land located around the main urban boundaries – is formally integrated within urban municipalities. This results in a rising number of urban farmers and informal urban agriculture production. As has been the case historically, urban agriculture provides an income stream, a food source in times of crisis and is a dominant portion of the urban food supply in some cities (Lang & Barling, 2012). It also indirectly suggests ways to reorganize urban food systems to make them more of a closed loop system, minimizing both the urban resources and goods purchased externally and reducing the exportation of waste and pollution (Nugent, 1999). Urban agriculture makes use of available land, forcing residents to exercise innovation in developing alternative style plots, while proving that food can be grown almost anywhere. The production of shrubs, trees, flowers and ornamental plants and food crops can beautify an urban environment, cool its climate, curb its erosion and absorb air pollution and odors (Mougeot, 2005). Urban agriculture systems also provide an appropriate and safe disposal option for biological waste produced within city limits (Mougeot, 2005). It also allows residents to not only survive, but improves many features of their life, by allowing them greater opportunity to spend their income on better healthcare, education, and housing.

Given rapid urban change and the value of urban farming, one important question is what the impact might be on African cities if urban farmers were better supported through policy, capacity development, and infrastructure. This issue is particularly important for women who play a strong and dominant role in urban farming. Their role as the household's primary provider requires them to frequently carry out the majority of urban farm labour, including tasks culturally assigned to men, such as managing livestock (Prain & Lee-Smith, 2010). There is a great deal of pressure on women historically to secure a family's health and stability as men tend to work externally and have less of a role in the maintenance and day-to-day responsibilities of the home (Lee-Smith, 1997). Also, women tend to have lower educational credentials than men and face barriers when finding suitable wage employment in the formal sector (Hovorka, de Zeeuw & Njenga, 2009). The combination of norms and educational status places women in a position to seek other ways of fulfilling household deficits, such as through urban farming. Considering this, this thesis examines how training for women urban farmers in a growing African city – Nairobi – affects their well-being and their farm practices.

The central question of this research is: what is the impact of training for urban agricultural production and marketing on female urban farmers in Nairobi? The study aims to evaluate the impact of training along four dimensions: social well-being and support, financial well-being, household health improvements to participants, and technical farm practices. Social well-being relates to a woman's formal social relations and connection within the community. Financial well-being is defined as a woman's financial security and regular sources of income and expenditure. Household health benefits measures a woman's (or the household of a woman's) physical and mental state in relation to illness or nutrition. Technical farm practices relates to a woman's practical methods used and environmental awareness in farming. In sum,

the thesis evaluates whether and how training in urban agricultural practices impacts these four dimensions.

The selection of these categories is based on my personal interpretation of international evidence about the role of training and absence of training for female farmers. This study is an independent but related part of a larger project focused on urban agricultural policy in three East African cities, which involves my supervisor, Dr. Christopher Gore, and the Mazingira Institute, in Nairobi, Kenya. Mazingira has extensive experience working with urban farmers and deep knowledge of global and Nairobi urban food systems. Since 2004, Mazingira has been training urban farmers through an intensive training program. This study examines the effect of one of Mazingira's training sessions.

The Mazingira Institute is a leading research institute in Nairobi, Kenya. In addition to research, the institute advocates on issues directly linked to the rights of women in the urban agriculture sector. Mazingira also provides regular training to disadvantaged men and women seeking assistance in the areas of food production and processing, market access, maintaining livestock and crop health as well as avoiding pollution and contaminants when farming. The institute's work has been recognized by the city of Nairobi, the Kenyan government, international organizations and the United Nations. Mazingira's research is led by its co-founders, Diana Lee-Smith and Davinder Lamba. Much of their work has focused on gender and urban agriculture, housing, land rights, human rights and environmental issues, specifically around emerging trends and future areas required for further improvement. Individually, both Lee-Smith and Lamba have made significant contributions to work in this area. Lee-Smith ran Settlements Information Network Africa (SINA) for 17 years and a global network on women and shelter from 2002-2010 (Lee-Smith, 2010). She has carried out independent research on low-

income urban housing, gender, transport, agriculture and finance issues, and is widely published. She was the Gender Focal Point for UN–Habitat (1998–2001), led the African regional activities of Urban Harvest in the Consultative Group on International Agricultural Research (CGIAR) (2002–2005) and was visiting Professor in Public Health at the University of Toronto (2006–2009) (Lee-Smith, 2010). Lamba has been an active participant in transnational social and intergovernmental projects throughout Africa. With a specific focus on urban agriculture, Lamba, pioneered the campaign for women's equal right to access, control and inheritance of land and property, launched at Habitat II in Istanbul (Habitat International Coalition, 2011). For his work in promoting secure land tenure and transparent land allocation, he received the UN-HABITAT Scroll of Honour Award in 1999 in addition to the Kenyan National Commission on Human Rights' Firimni Award in 2006 for fighting against corruption and promoting land reform (Habitat International Coalition, 2011). Together, Lee-Smith and Lamba have been heavily involved in government policy revisions and developments. They represented Mazingira on a central government task force, which had an aim to draft a revised Urban and Peri-Urban Agriculture and Livestock (UPAL) policy calling for support to UPAL. The policy recognized UPAL as a key contributor towards "improved livelihoods of the urban poor and its great potential in contributing to economic development of the country" (Dubbeling, 2010, pg. 9). The policy illustrated such features as the potential benefits, health implications and environmental risks for the sector, the lack of research and technology affiliated with UPAL, all while highlighting the poorly developed market infrastructure (Dubbeling, 2010). As of April 2015, the draft policy is sitting with the Kenyan national cabinet for approval. Mazingira has spent decades developing and maturing their understanding of urban agriculture in Nairobi and the broader

region, while building relationships with major stakeholders, such as farmers, government elite and leading authorities.

This research reveals that the urban agriculture based training offered by Mazingira is having a positive impact on female participants in the areas of social, health and financial well-being as well as their technical farm practices. Women who participated in the October 2013 urban agriculture training program improved their farming profit or increased their income generating streams; they have greater engagement in their community and stronger relationships with other farmers; the women have a steady supply of food for their personal needs; and, significantly improved their technical farm practices; minimizing their inputs, finding solutions to water scarcity and achieving good health and hygiene of their livestock.

This research also revealed that government elite participating in the training agree that urban agriculture has the potential to minimize Nairobi's food insecurity; however, despite the perceived benefits, not all are in agreement that the benefits outweigh the risks. What also remains inconsistent is the relationship between the farmers and the extension officers. There is a clear disconnect between what extension officers expect of the farmers and alternatively what farmers expect of extension officers.

The remainder of this thesis is organized in five chapters. Chapter two discusses urban agriculture in a global context, followed by the African context and ending with the role of women as urban farmers. Chapter three describes the physical setting in which the research was conducted, the method used to collect the data and detailed profiles of all key informant groups engaged in the study. Chapter four provides the research findings derived from interviews with key informants and general observations. The chapter demonstrates the impact training had on the participants of the October 2013 training as well as past graduates. Furthermore, it presents

important findings taken from interviews with government elite that demonstrate, anecdotally, if urban agriculture has the potential to eliminate Nairobi's food insecurities. The chapter also includes observations from the general training. Chapter five concludes the thesis, presenting recommendations that may enhance the impact of the training on the female participants. It concludes the thesis by reinforcing the importance of urban agriculture in the context of global food insecurity and reflects on what other developing cities may learn from the research and findings presented.

CHAPTER TWO: URBAN AGRICULTURE IN A GLOBAL CONTEXT: FOOD PRODUCTION AND URBANIZATION

Achieving food security is a global concern and a daunting task. Global food insecurity is a central concern of political leaders of middle and low-income nations, and numerous international agencies, such as the World Bank, World Health Organization (WHO), Food and Agriculture Organization of the United Nations, World Food Programme (WFP), Global Agriculture and Food Security Program (GAFSP), Convention on Biological Diversity, the Consultative Group on International Agricultural Research and powerful non-governmental agencies such as Oxfam, all make food security a central priority. There are many international declarations that have recognized the right to food as a fundamental human right. For instance, the Universal Declaration of Human Rights which was adopted by the United Nations (UN) on 10 December 1948 states in article 25, "everyone has the right to a standard of living adequate for the health and wellbeing of himself and his family, including food." (United Nations, 2014). Two decades later, the International Covenant on Economic, Social and Cultural Rights (ICESCR), ratified by 156 states, marked a significant step forward deepening the 'right to food' concept (Rae, Thomas & Vidar, 2007). Article 11 of the ICESCR states;

> 1. The States Parties to the present Covenant recognize **the right of everyone to** an adequate standard of living for himself and his family, **including adequate food**, clothing and housing, and to the continuous improvement of living conditions. The **States Parties will take appropriate steps to ensure the realization of this right**, recognizing to this effect the essential importance of **international co-operation** based on free consent.
>
> 2. The States Parties to the present Covenant, recognizing the fundamental **right of everyone to be free from hunger**, shall take, individually and through **international co-operation**, the measures, including specific programmes, which are needed:
>
> (a) To improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the

> principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources;
>
> (b) Taking into account the problems of both food-importing and food-exporting countries, to ensure an equitable distribution of world food supplies in relation to need.
>
> Adopted by UN General Assembly on 16 December 1966
> (United Nations 2014, emphasis added)

Article 11 is considered a core provision with regards to the right to food and its protection under international law (Rae et al., 2007). It highlights the "right to…adequate food" in more detail as the "right of everyone to be free from hunger" (Rae et al., 2007). This suggests, at the very least, that individual states and the international community have a responsibility to prevent hunger.

Since 1966, there have been many international instruments that prioritize and deal with the right to food. The World Food Summit (WFS) held in Rome, Italy in November 1996, for example, organized in response to the continued existence of widespread under-nutrition and growing concern regarding the capacity of agriculture to meet future food requirements and need (FAO, 1996). The objective of the WFS was to renew a global commitment at the most senior political level to eliminate hunger and malnutrition and to achieve sustainable food security for all people (FAO, 1996). This Forum set the political, conceptual and technical plan for an on-going effort to eradicate hunger in all countries with the target of reducing the number of undernourished people by half (FAO, 1996). In 2000, world leaders came together at the United Nations to adopt the United Nations Millennium Declaration, which confirmed a global partnership to reduce extreme poverty, setting out a series of targets to be met by 2015.[1] Millennium Development Goal 1, which is Eradicate Extreme Poverty and Hunger, commits to "Target 1.C: halve, between 1999 and 2015, the proportion of people who suffer from hunger" (United Nations, 2014, Target1.A). This target is directly linked to achieving global food

[1] Millennium Development Goals http://www.un.org/millenniumgoals/

security and cannot be achieved without sustainable agriculture, equally distributing agricultural goods, and building and supporting the capacity of the farmer.

The Millennium Development Goals (MDG) have raised international attention and visibility among key decision-makers in the private and public sectors, in the media and with the public at large. Since 2000, the UN has organized forums, summits and high level events to monitor and review the progress made in response of the 2015 targets. As 2015 neared, the General Assembly reported in the *Outcome document of the special event to follow-up efforts made towards achieving the Millennium Development Goals* that "significant and substantial advances have been made in meeting several of the targets" (para. 3) […] however, they "are concerned about unevenness and gaps in achievement and about the immense challenges that remain (para. 4)" (United Nations General Assembly, 2013). Moving forward on a post-2015 action framework, the UN requested strengthened global partnerships for development and national ownership and contribution to meeting the MDGs (United Nations General Assembly, 2013). This places accountability on national governments to make favourable policy decisions, allocate substantial resources to support and most importantly prove the commitment that is tied to their original ratification.

The present-day global food security situation and outlook remains unbalanced amid a surplus of food production. While severe hunger and under-nutrition remain for an estimated one billion people, food production has improved dramatically over the last fifty years (Hanjra, Ferede, Blackwell & Abbas, 2013). The global food system has responded to the world's food insecurities by more than doubling global food production through improved productivity and area expansion (Munir, 2013). Historical examples of risk mitigation arose in the 1960s and 1980s Green Revolutions, which caused agriculture productivity growth and area expansion.

These efforts helped to increase the volume of production and minimized cascading episodes of hunger and famine, while also providing benefits such as improved employment, income, nutrition, health, education and human capital (Prain & Lee-Smith, 2010). Even though the Green Revolution produced benefits it also presents a layer of controversy that constantly raises questions and concerns pertaining to the future of sustainable food production. Research reveals that indiscriminate use of agrochemical, irrigation, and heavy machinery resulted in widespread environmental damage. Experts would strongly argue that global industrial agriculture production has led to severe erosion of soil and fertility and significantly contributed to destructive greenhouse gases which results in climate instability, all impacting lower production rates (Hanjra et al., 2013).

Interestingly, Africa, a continent hardest hit by food insecurities, was not privy to the Green Revolution and achieved its food production growth via land expansions (Hanjra et al., 2013). There still remains huge yield potential in many agricultural-dependent African counties, which explains arguments for a new contemporary Green Revolution in Africa (Hanjra et al., 2013). However, controversy continues and debates remain in African over the sustainability and long-term impact of a more aggressive agriculture production approach. The important point to note here is that even with the increase in food production, people still do not have adequate access to proper nutritional sources of food. This shows that food security is much more than a supply and demand issue and if we are to develop a sustainable food system, we must first address the broader issues of sustainability in agriculture (Krug, 1999). Krug highlights in *Canadian Rural Women Reconstructing Agriculture*, the importance of rural and urban people working together to establish a strong enough constituency to resist dominant systems and build an alternative one (Krug, 1999). According to her, local food production requires sufficient

support from all sympathetic sectors to resist control by global powerhouses (Krug, 1999). Sustainable agriculture needs structural changes and not personal or isolated solutions that aim to curb consumption decisions (Krug, 1999). She believes in the importance of altering the economic or agricultural system as a more effective option; however, according to her this requires a strong unity and linkage between rural and urban systems as agents of influence and change (Krug, 1999).

Referring back to both the FAO's definition stated previously and the Ryerson Centre for Studies in Food Security's interpretation on the concept, it is important to remember that food security involves five non-negotiable elements – availability, accessibility, adequacy, acceptability and agency. One of the most important scholars to help understand the reasons for food insecurity and associated vulnerability is Amartya Sen. An influential Indian economist and recipient of the Nobel Prize in Economic Science, Sen has assisted in the development of a well-respected social choice theory, contributed to the study of the economic theories of famine and played an influential role in the formulation of the United Nation's Human Development Report. Sen argued that for the elimination of hunger in the modern world, "it is crucial to understand the causation of famines in an adequately broad way, and not just in terms of some mechanical balance between food and population" (Sen, 1999, pg. 161). More than two decades ago, in *Poverty and Famines: An Essay on Entitlement and Deprivation*, Sen stated that in most areas of the world – with the exception of areas within Africa – the increase in food supply has been comparable to, or even faster than, the expansion of the population (Sen, 1983). Given this, he wrote: "food insecurity is a failure of entitlement, where entitlement is understood as the set of alternative commodity bundles that a person can command in a society using the totality of rights and opportunities that he or she faces" (Battersby, 2011, pg. 547; Sen, 1983). The point Sen is

making is that it is problematic to concentrate on total global food supply or availability; rather, there is a need to focus on the "assets" that each person holds: the capital that an individual has at his or her disposal and the capability to use those assets to maintain a livelihood and prevent vulnerability. Based on Sen's theory, people suffer from hunger and starvation when they cannot establish their entitlement over an adequate amount of food (Sen, 1999). Sen states boldly: "Famines kill millions of people in different countries in the world, but they don't kill the rulers. The kings and the presidents, the bureaucrats and the bosses, the military leaders and the commanders never are famine victims" (Sen, 1999, pg. 180). Hence, food insecurity is not only from lack of food but from the inequalities built into the systems for distributing food. The fact is that global agriculture produces enough food to feed the world's growing population; however, food is not equally distributed or accessible to all.

Food security is directly linked to agriculture production and agriculture production is sensitive to climate change. Agriculture will be the hardest hit sector in the face of climate change (Hanjra et al., 2013). Risk is prevalent in agriculture, and will now be heightened by the looming reality of climate change (Hanjra et al., 2013). Increased drought, heat waves, flooding, abnormal weather patterns, altering of growing seasons, and increased (native and non-native) species are only a few direct symptoms of climate change. Climate modeling scenarios have indicated that the dry lands of North Africa and West Asia, for example, will be severely affected by droughts and increased temperatures in the coming years (Bisht, 2013). A greater frequency of global climate variability has already been observed and caused severe destruction in recent years. With the impacts of climate change materializing, research is demonstrating dangerous implications for agriculture production and food security of the poor farmers and urban households in the developing world (Hanjra et al., 2013). Risk of crop failure, pest infestation,

water scarcity, and livestock deaths will result in direct economic losses for farmers and undermine food security for households, communities and nations (Bisht, 2013). Studies show that for temperatures increasing above 3°C, yield losses are expected to occur (Bisht, 2013). With yield decline, commodity prices will naturally increase, feeding back into the above discussion of accessibility and availability. This is a major development issue for agriculture-dependent countries that are currently facing food insecurity issues and therefore causes the individual farmer and community to adapt in order to survive. Urban agriculture is one approach or practice that has proven valuable both historically and in contemporary times, to minimize food insecurity and reduce household vulunerability.

In the remainder of this chapter, a brief review of the history urban agriculture globally and in Africa is presented. This chapter highlights characteristics of urban agriculture and why it is particularly important for women. It reveals the importance of supporting and offering women opportunities for improved capacity development and training in urban agricultural productions. This chapter draws considerably from the work of Diana Lee–Smith. After mining the literature it became obvious that her breath of published research and knowledge in urban agriculture, particularly in women's issues, was significant.

2.1 Global Perspective of Urban Agriculture

Urban farming as a basic function of cities is nothing new and has a very long history. For instance, the Aztec, Mayan and Incan cities of the Latin American region were self-reliant on perishable fruits and vegetables; but also produced portions of grains within a confined hinterland (United Nations Development Programme, 1996). In more recent years, statistics reveal that historically and globally urban households have routinely engaged in urban agriculture. It was estimated that some 200 million urban dwellers were practicing urban

agriculture globally, as a means of providing food and income to roughly 700 million people (Mougeot, 1994). For instance, in 1991, 25 per cent of urban households in the United States of America were practicing urban agriculture (Mougeot, 1994). Fifty per cent of urban households in Peru and 65 per cent in Moscow were also practicing urban agriculture (Mougeot, 1994). In Kenya, research conducted in the 1980s across six cities, found that out of 1576 urban households surveyed 29 per cent grew a portion of their food and 17 per cent raised livestock in their personal residence (Mougeot, 1994). Other research from the 1990s showed that in six Chinese cities, 85 per cent of residential vegetable requirements were grown within urban boundaries (Mougeot, 1994). By the late 1990s, a great deal of research was beginning to be published on the importance of urban agriculture globally to minimize hunger (Koc, MacRae, Mougeot & Welsh, 1999).Urban agriculture has various purposes worldwide, from food and nutrition security, income generation and economic development, community cohesion, and ecological sustainability and design (Lee-Smith, 2013; Gorgolewski, Komisar & Nasr, 2001). Urban agriculture, as a food system initiative, has been designed to primarily benefit urbanites directly, but also has a positive impact on rural people as well (Krug, 1999). As urban dwellers grow their own food, they gain an appreciation for the work of rural farmers and also develop a preference for locally grown, non-processed, organic food (Krug, 1999). This has also removed some power and control within the production and distribution of food from large companies and indirectly sensitizes consumers to the value of local food security (Krug, 1999).

Over the past twenty years, Cuba and Brazil have developed some of the most successful examples of urban agriculture in the developing or poorer countries of the world and have frequently been studied.

Havana, the capital city of Cuba, with a population sitting at more than two million people, has played a leading role in the evolution and revolution of urban agriculture (Koont, 2009). An impressive 35,000 hectares (over 87,000 acres) make up the cultivated areas of Havana, with some parts of the city having relatively low population densities, of roughly 2,300 to 3,5000 people per square mile compared to 50,000 to 100,000 per square mile in the more densely populated areas (Koont, 2009). The necessity for Cuba to shift to organic urban agriculture in the early 1990s is both well-known and widely understood, catalyzed by the collapse of the Soviet Union ending Cuba's dependence and the large scale, industrial agriculture that the country had been practicing since before the 1970s (Koont, 2009). Favorable relations between Cuba and the former Soviet Union resulted in the importing of foodstuffs to be cheaper and more viable then producing sufficient food domestically (Holt–Gimenez, 2006). When Cuba lost its major trading partner, the impact plunged the country into a profound agrifood crisis, "forcing it to double food production while halving agricultural inputs" (Holt–Gimenez, 2006, p. 31). In 1990, the government of Cuba declared a *Special Period in Time of Peace* and took desperate measures to regain food security (Holt–Gimenez, 2006). Prior to this, urban agriculture within Cuba was nearly non-existent and had an attached stigma that suggested only the poor farmed (Altieri et al., 1998). However, in times of absolute necessity many urban professionals stepped out of their traditional comfort and began practicing farming and gardening in order to meet their household nutritional requirements (Personal Communication with Civil Servant, Havana, 2005). Cuban Ministry of Agriculture was actively involved in the promotion of urban agriculture and offered residents the ability to farm on state land at no cost (Moskow, 1999). The simple act of providing free land for primary production minimizes all five barriers of

affordability, accessibility, adequacy, acceptability and agency which contribution to food insecurity.

During the crisis, it became very clear that industrial and input dependent agriculture production of Cuba's original mechanized state farms were inappropriate and impracticable (Holt–Gimenez, 2006). Not only was the amount of cultivated land allocated for urban production impressive, but it is well known that the country's agricultural industry functions on biological fertilizers and cultural pest control techniques only (Personal Observation, Havana, 2005). Cuba's urban agriculture success is also based on the integration of a variety of strategies that considered Cuba's social, economic and environmental concerns of food security that have been afflicting Cubans since before the 1990s (Altieri et al., 1998). With the adoption and accessibility of urban agriculture and the presence of (nearly) organic production helping to offset contaminated foodstuff, Cuban diets also benefited (Knoot, 2009). From an environmental standpoint, the city of Havana has gained tremendous green space, transforming plots that were originally unappealing and held no purpose, into productive land (Personal Observation, Havana, 2005). The social and environmental impacts have also been significant, creating sizeable sources of urban employment, incorporating women, young adults as well as retirees into the workforce (Knoot, 2009). In 2005, more broadly throughout Cuba, the total workforce sat at 4.8 million, and with the introduction of urban agriculture prior to that, over 350,000 new employment opportunities have been introduced (Knoot, 2009). With relation to training and capacity building, it is important to understand that Cuba had a highly educated urban population, but persons with little knowledge regarding ecologically based agriculture (Knoot, 2009). Cuba accounts for two per cent of the Latin American population and 11 per cent of the Region's scientists, which provided a tremendous expert base to support urban agriculture

production (Altieri et al., 1998). A combination of well-trained urban scientists who had completed extensive research and rural peasants who held traditional agro-ecological knowledge that could be transferred to the opposing party developed a very unique partnership (Knoot, 2009). This teaching opportunity was leveraged and welcomed by research institutes, universities, and organizations (Knoot, 2009). Thinking ahead, urban agriculture has now become the feature of elementary school curriculums ensuring that future generations are prepared (Personal Observation, Havana, 2005).

Another country with cities that have embraced urban agriculture is Brazil. Brazil has an estimated population of 200 million people. Major cities in Brazil are often widely perceived as condensed, built up and offer no open public areas. However, Brazil's 120,000 urban farmers find space to plant in areas ranging from community gardens to the roof tops and balconies of homes in very poor neighbourhoods (Ortiz, 2012). Large cities in Brazil are faced with poverty and food security challenges, leaving middle and lower-income households to practice urban agriculture for personal consumption or income generation (Madaleno, 2000). The benefit of urban farming was recognized by Brazilian Business Council for Sustainable Development when they introduced the Rio Sustainable City Program (Ortiz, 2013). This pioneering program has introduced urban farming in two favelas or shantytowns: Babilonia and Chapeu Mangueira, both located in the southern Rio de Janeiro District of Leme (Ortiz, 2013). The program will train (volunteer) residents of the favelas for five months on techniques for growing crops in household planters (Ortiz, 2013).

The government of Brazil began funding urban agriculture programs back in 2003 and as of 2010, approximately 20 million dollars has been invested in the sector, and 74,000 people have benefited from urban agriculture based employment (Ortiz, 2013). Helio Tomaz Rocha,

coordinator of urban and peri-urban agriculture at the Brazilian National Secretariat for Food and Nutrition Security, highlighted the need for public policy to promote urban agriculture when he stated, "We know that it works, that there is space available in cities, but there is no formal system. It is moving towards greater sustainability, but it needs an initial boost" (Ortiz, 2012, para. 34). According to Lee-Smith, Brazil has advanced further than most, incorporating urban agriculture into policy measures based on the Right to Food (Lee-Smith, 2013).

In a study based in Belém, the capital city of Pará, a state located in a Northern Brazil, 5551 families of urban food producers were interviewed (Madaleno, 2000). The sample focused primarily on heads of households or key family members engaged in urban agriculture. The study presented convincing evidence which demonstrated that Brazil's struggle with poverty encouraged home gardening citywide (Madaleno, 2000). The data also revealed a trend towards food self-reliance similar to other fast-growing cities in the developing world (Madaleno, 2000).

Belo Horizonte is another celebrated example of a Brazilian city that has embraced and responded to the urban food security challenge. Belo Horizonte, the fourth largest city in Brazil and the capital of Minas Gerais state, has a population of over 2.4 million people (Rocha, 2001). In the early 1990s, it was estimated that 38 per cent of families in Belo Horizonte lived below the poverty line, with 44 per cent of all children living in poverty, and close to 20 per cent of children under the age of three showing some degree of malnutrition (Rocha, 2001).

In 1993, the newly elected municipal government of Belo Horizonte implemented a program with the aim of reducing food insecurity within city limits (Rocha, 2001). The program was designed and guided by the notion of food security; interpreted as a principle that ensures citizens have access to adequate quantity and quality of food throughout their lives, and that it is the responsibility of governments to guarantee this right (Rocha, 2001). The program has three

main lines of action. The first encompasses policies geared to assisting poor households and individuals with their food consumption needs via permanent sustainable initiatives monitored by civil society groups (Rocha, 2001). The second is directed at the private food trading sector, requesting their participation and contribution in bringing food to areas of the city previously neglected by commercial outlets (Rocha, 2001). This also includes the adoption of policies to regulate prices and control quality of basic food staples supplied under the program (Rocha, 2001). The third line of action attempts to increase urban food production and supply through technical and financial incentives for small producers, and the promotion of urban agriculture and community gardens (Rocha, 2001).

One key feature of this program was the support via the Municipal Secretariat of Supplies (Secretaria Municipal de Abastecimento) to develop and carry out integrated policies addressing malnutrition and hunger within city limits (Rocha, 2001). The Municipal Secretariat of Supplies is a separate administrative structure that centralizes the planning, coordination and execution of municipal food security polices in Belo Horizonte (Rocha, 2001). This centralization has allowed for a fundamental review of how food-related programs are perceived, which has resulted in the incorporation of food security into municipal public polices; and, is considered one of the programs greatest accomplishments (Rocha, 2001). The political commitment and willingness on behalf of the municipal government of Belo Horizonte is recognized as a key component in the program's success; proving that "politics matter" (Morgan 2010).

The Belo Horizonte program has been monitored and evaluated for many years by a variety of multi-disciplinary stakeholders (Rocha, 2001). The consensus is that the program addresses some of the most significant challenges associated with hunger and malnutrition, so much so that

some food policy experts have dubbed Belo Horizonte as "the city that ended hunger" (Rocha 2001; Morgan 2010).

Cuba and Brazil offer examples of two countries that have embraced urban agriculture due to necessity and achieved results. Cuba has proven that urban farming has the potential to combat major food security issues with little additional resources but appropriate policy. The example also shows urban agriculture can be successful with little input but deserves the knowledge and innovation from a multi-disciplinary team of professional and non-professionals. Data collected in Brazil has proven that poverty pushes people to look for self-reliant options and in this case, urban agriculture was embraced. It also reveals that cities built up with urban development and decay can still find opportunities to practice urban agriculture and have responded very successfully in some cases, such as in Belo Horizonte.

Many countries around the world practice urban agriculture, in wealthy and poorer regions, providing success stories that showcase alternative and sustainable urban agriculture practices. However, there is a policy and research debate surrounding urban agriculture which tends to divide stakeholders who support it as an effective pro-poor development strategy and those are more skeptical of its impact as a tool to achieve food security and poverty alleviation. There is corresponding literature that challenges the validity of both the benefits of urban agriculture and the body of research that advocates for it, particularly in South Africa. Webb states in his article, "*When is enough, enough? Advocacy, evidence and criticism in the field of urban agriculture in South Africa*" that successful case studies were largely reused due to lack of academic literature prior to the 1990s; early literature failed to present a convincing case for urban agriculture; and, evidence was often based on generalizations, for instance distinctions between rural and urban (Webb, 2011). According to Web, quantitative data derived from mid-

1990s onward began to appear with revisions from earlier claims and future research tended to be approached with more caution (Webb, 2011). For instance, earlier notions that suggested marginalized demographics were the primary beneficiaries of urban agriculture was now being challenged with data showing a greater prevalence of urban agriculture among the less marginalized (Webb, 2011). Webb firmly articulates that there is so "little rigorous data indicating that the practice could be sustainable, that it is an unequivocal source of household food security or that it provides the benefits that the cultivators are said to enjoy " in South Africa (Webb, 2011, pg. 201). Frayne et al state in their article *Growing out of Poverty: Does Urban Agriculture Contribute to Household Food Security in Southern African Cities*, findings that position them to support the argument that urban agriculture is not an effective tool when aiming to achieve food security. Their paper demonstrates urban context is an important predictor of rates of household engagement in urban agriculture; it presents urban agriculture to not be an effective food security strategy for urban poor; and, household levels of earnings and land holdings are strong determinants as to the impact of urban agriculture on their of food security, for instance wealthier levels of earning derive greater net food security (Frayne et al., 2014). To summarize, his findings prove urban agriculture to have limited poverty alleviation benefits under certain modes of practice and regulation (Frayne et al., 2014). The important learning to take from the opposing view is that the debate around the benefits and relevance of urban agriculture will continue. An approach towards the promotion of urban agriculture as a path out of poverty and a solution to the elimination of food insecurity must be one that is cautious.

2. 2 Urban Agriculture in an African Context

Urban agriculture is a component of most, if not all, cities in sub-Saharan Africa[2] (Gallaher, Kerr, Njenga, Karanja & WinklerPrins, 2013). People have been farming in African cities since their inception; however, colonel and post-colonial governments often discouraged or outlawed the practice because it did not match with conceptions of a modern city (Gallaher et al., 2013). In recent years, however, this has changed in some cities as food insecurity in Africa rises. For years in Africa,[3] food insecurity was primarily viewed as a rural problem, which was reinforced by western development theories where poverty was seen as a rural issue. However, this understanding of poverty has shifted to recognize the prominence of urban poverty as well, and that the urban poor require different coping strategies for food than rural residents due to lack of inputs and land. Access to food is a central challenge for urban residents (Battersby, 2011). According to Battersby's research in South Africa, city dwellers tend to be much more dependent than their rural counterparts on a cash economy to acquire their food (Battersby, 2011). Given this dependence, any weakness in urban food systems can drive households into further or more extreme food insecurity.

In Africa, the issue of food insecurity has been a reality for many low-income urban dwellers for decades. Globally, in 2011, the region receiving the most food aid was sub-Saharan Africa, which illustrates a signficant need and also a dangerous dependence (World Food Programme, 2011). The issue is not lack food, it is that urban residents simply cannot afford it (Prain & Lee-Smith, 2010). Household food insecurity often increases as the proportion of

[2] For the purpose of this thesis, sub-Saharan Africa is defined as the geographical area of the African continent that lies south of the Sahara Desert.

[3] For simplicity, the thesis refers to sub-Saharan Africa as 'Africa', but it is recognized that this excludes countries of North Africa that still exist within the African continent.

income used to purchase food for the home rises. The less accessible and affordable the alternatives to buying food are, the more serious the insecurity will be (Prain, 2010). In many African cities, urban residents spend as much as 75 per cent of their household income on food, which leaves limited funds for other necessities such as healthcare, housing and schooling (Oxfam, 2011). In addition, the ability to acquire the appropriate nutrition levels needed for the maintenance of proper health is a continuing struggle. To offset expensive food insecurities and household costs, households practice urban agriculture as a livelihood strategy (Prain & Lee-Smith, 2010).

In an attempt to understand the scope and scalability of urban agriculture in the continent, Lee-Smith highlights data from 11 towns and cities across Southern Africa and their representative percentages of poor households practicing urban agriculture (Lee-Smith, 2013). The data has emerged from years of research and reflection represented in various bodies of literature. The research revealed that in some cities, a high proportion of the urban poor practice urban agriculture: Blantyre (Malawi) 66 per cent ; Harare (Zimbabwe) 60 per cent; Maseru (Lesotho) 47 per cent; Msunduzi (South Africa) 30 per cent; Maputo (Mozambique) 23 per cent; Manzini (Swaziland) 10 per cent; Johanneberg (South Africa) 5 per cent; Gaborone (Botswana) 5 per cent; Lusaka (Zambia) 3 per cent; and, Windhoek (Namibia) 3 per cent (Lee-Smith, 2013). Figures in Nakuru (Kenya) show urban farms supply 22 per cent of the basic food intake of farming households and eight percent of the overall food and nutritional needs of the town (Lee-Smith, 2013). With even higher proportions, Dar-es-Salam (Tanzania) appears to generate 90 per cent of the city's leafy vegetables and at least 60 per cent of its milk via urban agriculture (Lee-Smith, 2013). Furthermore, studies conducted with East and Central Africa showed among the households involved, almost all consumed more foodstuffs than they sold, which suggests urban

farming not only provides food but also helps save on expenses (Lee Smith, 2013). There is also considerable evidence that suggests urban farming households are better off financially than the norm (Lee-Smith, 2013). It has been informally claimed that anyone in Dar-es-Salam with a vegetable garden and one or two cows has the potential to earn more than the basic government salary (Lee-Smith, 2013). In Kampala and Nakuru, households with higher incomes have been directly linked to livestock production, resulting from the sale of products such as milk, eggs, and meat (Lee-Smith, 2013). Kampala is one city in Africa that has been studied and measured over time, with research showing that urban agriculture activity has increased steadily (Lee-Smith, 2013). There seems to be little doubt that urban agriculture is on the rise in Africa and providing an important contribution to the problems of food security confronting this region in particular.

Urban agriculture can range from a small single potted plant to a large farming system covering multiple hectares (de Neergaard, Drescher & Kouamé 2009). It includes production used for personal subsistence as well as commercial businesses (de Neergaard et al., 2009). Urban farming can take place on privately owned land, on rented or borrowed property, along roadsides and rivers, and in public spaces with no secure tenure (Personal Observation, 2013, Nairobi). The choice of commodities farmed often reflect the needs of the household, the local preferences, commercial and business opportunities, bioclimatic conditions, local agriculture policies and the availability of seeds (de Neergaard et al., 2009). In the past, Kenyans consumed a wide range of indigenous vegetables including cowpea leaves, amaranth, and African nightshade. Over the past several years, in urban areas especially, indigenous vegetables have been replaced by kale, swiss chard, and cabbage (Gallaher et al., 2013). The rationale is higher

yielding and easier harvests resulting in cheaper purchase prices for the end-consumer (Gallaher et al., 2013).

With the increased occurrence of urban farming, research support has improved and encouraged policy responses in several African countries and towns (Lee-Smith, 2013). In South Africa, the city of Msunduzi reports urban agriculture to be relatively high. Contributing factors could be that Msunduzi is considered a small city with in a poorer area of the country. It may also be a result of a project in the early 2000s, involving the municipal government which created a supportive policy environment (Lee-Smith, 2013). Tanzania recognized urban agriculture in its Local Government Act of 1982 (Section 80) and the town and Country Planning Ordinance (CAP 378) of 1992 (Lee-Smith, 2013). The impact of such measures has been used to justify the significant levels (90 per cent) of urban households practicing agriculture within city limits (Lee-Smith, 2013). The government of Kenya recently incorporated urban agriculture in the National Land policy adopted in 2010 and the planning requirements for urban authorities in Urban Area and Cities Act 2011 (Lee-Smith, 2013). While the city of Nakuru's Municipal Council developed urban agriculture by-laws, which was a response to research (Lee-Smith, 2013). Within cities that have supported urban agriculture policy initiatives, it is unclear whether such policies will benefit the poor and marginalized.

Poor urban farmers in Africa tend not to own land and therefore practice farming informally in open spaces. This space is often public land and naturally used for urban development. In Tanzania, where urban agriculture is supported by policy, poor and female-run households continue to be less able than others to practice urban farming. These groups are constantly evicted when farming in public areas due to lack of land rights (Lee-Smith, 2013). This inability to support and protect the poor in the face of urban land development questions the

effectiveness of urban agriculture policy. Sadly, poor urban farmers are not considered a priority when other interests compete for development of urban land (Lee-Smith, 2013). The existence of committed interest groups, such as influential non-governmental organizations, across many sectors is necessary to place the needs of poor urban farmers as important (Lee-Smith & Prain, 2010, Pg. 294). However, it is not a sufficient condition for such policy development and requires the political will within the decision making arena (Lee-Smith & Prain, 2010, Pg. 294).

2. 3 Women's Role in Urban Agriculture

In the past, it has been difficult to assess women's participation and contribution to urban food production as research focused on the general idea of the "urban farmer" which many viewed as referring simply to men (Hovorka, de Zeeuw & Njenga, 2009). Over the past three decades, studies have documented women's predominance and leadership in the African agriculture context, with a particular increase in female urban farmers in the Central African Republic, Kenya, Mozambique, Tanzania, Uganda, Zambia, and Zimbabwe (Swedish International Development Cooperation Agency, 2003). Studies based in Yaonudé, (Cameroon) suggests that the idea of women's role in farming as primarily for subsistence could be changing as data shows that women dominate both subsistence and commercial production (Lee-Smith, 2010). Women play a dominant role in agriculture; therefore, it comes as no surprise to learn that most urban farmers have been women (Tinker, 1994). Women also tend to be the heads of households, which show how critical urban agriculture is to the survival of low-income families (Tinker, 1994). In addition to this, a woman's sense of self is also often based on her ability to feed her family. If she loses access to food and is no longer able to provide for her family, her source of power and identity may become less (Van Esterik, 1999). For women who are

normally responsible for household food security, the experience of being unable to provide for her family can be one full of anguish and distress (Van Esterik, 1999).

As far back as the 1930s, women in Dar-es-Salamm, Tanzania, for instance, have been practicing urban agriculture to supply food for their families (Lee-Smith, 2010). According to a gender analysis led by Hovorka and Lee-Smith, urban wage workers were expected to be fed by their wives, which resulted in backyard farming (Lee-Smith, 2010). This practice and way of life continued to strength following the country's independence in 1961 (Lee-Smith, 2010). Official food and agriculture policies based on rural production failed to supply urban workers with an enough food and urban agriculture dramatically increased (Lee-Smith, 2010). In 1950, the portion of urban labourers with farm plots rose from seven per cent to 70 per cent of households in low-income areas (Lee-Smith, 2010). In the 1980s, the figure sat at 80 per cent, with two-thirds of the agricultural workers being women (Lee-Smith, 2010).

Women face barriers related to their agricultural practice, often times a result of their low social status and lack of land rights (Lee-Smith, 2013). Household economic deficiency is another major barrier, as it is difficult for women to find the capital to purchase inputs such as the soil, compost, seeds, livestock, and irrigation required to develop or improve a small scale urban farm. This is especially difficult if they are already forced to prioritize their household necessities each month. Despite the contribution that urban agriculture has made economically and nutritionally to cities, minimal attention has been given to allocate or retain lands for urban agricultural uses as developing cities expand even further (Schmidt, 2012). For example, Dar es Salaam, Tanzania is one city experiencing rapid urbanization which has resulted in regular land conflicts between farmers and residents of newly developed land (Schmidt, 2012). Further to this, there are no regulations or guidelines in place to govern such conflicts (Schmidt, 2012).

There is significant opportunity to increase the food security of families and cities if women are given more support and training in the urban agriculture ventures. As the literature notes, in low-income regions of Africa, the role of female farmers could increase food output if given the proper support, credit and better infrastructure (Lang & Barling, 2012). Considering this, what would the outcome be for families and cities if training opportunities are provided to female urban farmers to assist them in overcoming the barriers that they are presented with? Many people assume that training helps an individual but it is often difficult to demonstrate and provide evidence of the impact.

As mentioned above, there are barriers for women to be actively engaged in urban food production and one way to break down the barriers is through training and capacity development. More specifically, capacity development, in terms of "the process by which individuals, groups, organizations and countries develop, enhance and organize their systems, resources and knowledge — all reflected in their abilities (individually and collectively) to perform functions, solve problems and set and achieve objectives" (United Nations Development Programme, 2002, p.99). Female farmers are often excluded from formal agricultural training, placing them at an immediate disadvantage (ETC-RUAF et al., 2004). This directly hinders their ability to exercise innovation and entrepreneurship, their knowledge base, skill set and potential to achieve their maximum growth and development in all four dimensions listed earlier – social, financial, health and technical farming practices.

Urban agriculture requires an immediate investment of household inputs such as labour, land and capital, even for limited production. This return on their investment, such as a prosperous harvest, can motivate women to move beyond acquiring food for domestic needs (Hovorka et al., 2009). Instead, providing women with the knowledge to gain entry into a

business enterprise could have a significant impact on many dimensions of their lives. During an interview with a female agricultural extension officer for Nairobi County, she was asked what the role of women in urban agriculture was and she responded by saying: "If they are empowered food security would be a thing of the past" (Government Elite A, Former Nairobi County Extension Officer, Thursday 17 October 2013). If capacity development and competencies were taught more frequently, women may have better opportunities to learn how to develop food production businesses, which would generate income for their families and help alleviate pressures that contribute to poverty.

This chapter highlights successful examples of urban agriculture in developing cities, both historically and in present day. It emphasizes that food security is linked to accessibility and affordability, while demonstrating that political commitment and policy are key components to achieve urban food security. As poverty continues to increase in developing cities so will the number of urban residents seeking survival strategies, particularly women who often hold the domestic responsibilities. As women in developing cities turn to urban agriculture for subsistence and financial means, capacity building and training become important to their success.

CHAPTER THREE: RESEARCH SETTING, CONTEXT AND METHODOLOGY

The aim of this study is to evaluate the impact of agriculture based training and capacity building on a small group of female urban farmers residing in Nairobi, Kenya. The research focuses primarily on the short term impact of the training on their social well-being, financial well-being, household health and their technical farm practices. The following chapter describes the methodology and research processes used for this study. It also provides detailed information about the setting and context in which this study was conducted. It begins by describing the aim, purpose and format of Mazingira's training in addition to the follow-up and networking opportunities offered post-training. The chapter moves on to explain how the primary and secondary data were collected and used to complete the study. It provides detailed information on the four key informant groups: participants of the October 2013 training; past graduates; government elite; and non-government elite. It also highlights the four most common situational profiles for two of the key informant groups: current training participants, and past graduates. More specifically, the profiles selected describe reoccurring personal and professional circumstances as well as aims and goals identified among the individuals within each key informant group. As a result, this chapter provides significantly more detail and context about the farmers compared to the other key informants. It was important to provide comprehensive profiles of the farmers involved, as they are key informants in this research, and, therefore it is important to gain a thorough understanding of their realities and daily farming. I provide more qualitative results taken from interviews with the farmers as well as results derived from interviews with the remaining informant groups in chapter four.

This study generated a large amount of qualitative data from semi-structured interviews and general observations. In explaining the method, information about the participants, which is

derived from the original field research, is shared. To summarize, this chapter will provide detail on how this study was conducted, the environments in which it was carried out and information about the key informants. It also provides a detailed view and insight into the lives of urban farmers and their daily activities.

3.1 Mazingira's Training Model

The Mazingira Institute offers training and education to women and men, twice per year, with the aim of providing them with the skills and competencies to fulfil their personal urban agricultural goals. This section will describe the training model and format used by Mazingira; however, the pedagogical aspects and limitations of training generally are not addressed. Since 2004, approximately 500 participants have been trained at the Mazingira Institute, with two one-week training programs offered per year. The purpose of the training course is to "advance [the] well-being and work and income opportunity, [for the] individual or collective, [in] the common interest of the community" (Canadian International Development Agency, 2012, pg.1). The training course objective is "to develop knowledge, skills and attitudes of the target farming community, composed of households, groups organizations and enterprises, inclusive of youth, women and men, for the practice of urban and peri-urban agriculture" (Canadian International Development Agency, 2012, pg.1). (See appendix 1 for a detailed systemic model used by Mazingira for the urban agriculture training course.) The goal of the training is to improve the participants' farming knowledge and skill, expand their professional network, teach participants the importance of conducting their farm practices as a business, and inspire the participant to advocate for urban agriculture while teaching and training others (Canadian International Development Agency, 2012). According to Mazingira, training participants have illustrated great successes, such as improved farming techniques and a more sophisticated business model. The

training's success can be evaluated in many ways, such as: who participates; the training itself; and the impact on participants, which is the hardest to measure and evaluate. This thesis engages with this latter issue because to date, there is very little data evaluating the impact of training on female farmers in relation to their social, health and financial well-being as well as technical farm practices.

Mazingira's one-week intensive training offers participants the opportunity to expand their knowledge on a variety of urban agriculture related components. (See Appendix 2 for the detailed programme outline for the October 2013 training.) There are four major pillars to the training: farm operations, which include production, processing and distribution; farm resources, which encompass entrepreneurship, capital and inputs; farm community, which represents social platforms and industry networks; and farm business, a fairly new addition, requiring participants to develop their own personal business plan which they are expected to implement when they return to their communities (Canadian International Development Agency, 2012).

Once participants complete the training they become members of the Nairobi and Environs Food Security, Agriculture and Livestock Forum (NEFSALF), a network of individuals and groups from the community, government and market sectors (Mazingira Institute, 2005). The aim of NEFSALF is to promote cooperation throughout Nairobi in the areas of food security, and agriculture and livestock keeping in urban agriculture (Mazingira Institute, 2005). Figure 1 shows a woman sharing her knowledge at a NEFSALF booth at the 2013 World Food Day held at Jamhuri Park in Nairobi, Kenya. She is a past graduate of Mazingira's training program**.**

FIGURE 1: A Past Graduate at World Food Day

This Forum (NEFSALF) has been operating since 2004, with diverse membership including urban farmers, civic organizations and research groups, as well as central government representatives, city representatives, and private producers, consumers and distributors (Mazingira Institute, 2005). Since the inception of the Forum, approximately 2,000 people have joined forces, working towards the common goal of promoting cooperation among all stakeholders involved in improving food security and urban and peri-urban agriculture in Kenya (Staff at Mazingira and urban farmer, Saturday 12 October 2013). Mazingira offers a physical space for Forum participants to meet three times per year. The first NEFSALF meeting scheduled after a training session is considered a follow-up for graduates and mandatory for their course completion. The participants are required to bring a one-page summary of their progress to date, and they receive their final course completion certificate.

An important feature of the training is the networking opportunity Mazingira fosters post-training, with the two distinct "hubs" that focus specifically on female and youth graduates. The youth hub, for example, provides a space for youth graduates (under age 30) to discuss challenges, best practices and opportunities for youth involved in urban agricultural activities.

The women's hub has a similar aim for female graduates. One past graduate of the training, a middle-aged energetic mother who is now a successful urban farmer, trainer, and leading member of the women's hub, defined the hub as a group of female training graduates that collectively work and train together (Past Participant B, Saturday 12 October 2013). She explained that in order to become a member, one must graduate from the Mazingira training as well as make a small consistent financial contribution that is used to offer grants to other members who require capital for the advancement or improvement of their current urban farm or for those who need capital to start their business plan. As of October 2013, the women's hub had saved $1,000.00 USD; the hub members were also the community recipients of the 2013 Nairobi World Food Day, Best Performing Award, an impressive and significant accomplishment given out by the national government. When speaking with a member of the women's hub, a very strong sense of camaraderie and empowerment was detected as she spoke of an optimism that has clearly come from her work with the women's hub and her own trials, tribulations and successes. The networking opportunity fostered by the Mazingira training is a very valuable outcome of their training.

The training does not offer formal follow-up and this is primarily due to lack of resources. The staff at Mazingira estimate that follow-up for the one-week training would take approximately one month to complete in order to speak with and visit all participants. Presently, funding and staff time does not allow for this. Mazingira does; however, follow-up with participants who request extra support. An interesting observation shared by Mazingira staff is that participants who do stay connected with Mazingira and request extra personalized support often become the strongest and most successful graduates. On average roughly five graduates request follow-up support per training.

3.2 Data Collection and Method

The goal of this research was to evaluate the impact of training on female practitioners of urban and peri-urban agriculture in Nairobi. The process of investigation began by reviewing existing literature and research on urban agriculture policy in East African cities. Based on these initial findings, the city of Nairobi was selected because: the city has a very long history of urban farming; there is a high density of small scale farmers; a high volume of food is produced within the city boundaries for consumption in the city; there is a strong base of existing research on the city; and there was a unique opportunity to evaluate an existing training program targeting farmers.

The findings are informed by primary and secondary data. Primary data was collected during an 18-day research trip to Nairobi in October 2013. The primary data collected was mainly qualitative. The research data was collected via questionnaires, general observation, and semi-structured interviews with 21 female and 17 male training participants; six female and seven male past training participants; four female government elite; and two female and one male non-government elite. The secondary data was drawn from journal articles, books, government reports, and news media.

The Ryerson Research Ethics Board approved the research study under the auspices of the broader research project led by Dr. Christopher Gore and the Mazingira Institute. Prior to the site visit, an interview protocol was finalized and key informants were identified. Some key informants were preselected while others were identified through a snowball method. Four key informant groups were interviewed for this research and are described below in sections 3.3 through 3.6.

3.3 Key Informants – Group 1: October 2013 Training Participants

The first group of informants was made up of individuals participating in the October 2013 training offered by the Mazingira Institute. There were 38 participants registered in the training, 21 women and 17 men. Trainees had varied and diverse profiles, ranging in gender, age, location of residence, education level and current farm practices.

The staff at Mazingira Institute selected the training participants (using an application process) with the aim of attaining a very diverse spectrum of people. The recruitment process is done via word of mouth. Staff at Mazingira, extension officers involved in the delivery of the training, and past graduates share and promote the training with urban farmers in their personal and professional networks. In addition, members of staff at Mazingira actively identify and personally invite selected urban farmers they meet or work with throughout the year to consider applying. This varied recruitment process generates interest and strong participation numbers for the training. It was observed that the participants selected for this training were not of the lowest socio-economic demographic in Nairobi, Kenya; rather, they were in a lower to middle income household. This is consistent with research on urban farming in Africa where the poorest of the poor are not usually the ones engaging in regular farming. Prior to the training, each participant's application was provided and reviewed for the purposes of this study. Each application included the participant's personal training expectations and revealed the participant's expectations before the training. Nine expectations were common among participants:

- 89 per cent expected to gain and expand their knowledge during this training – the desired topic ranged considerably; however, it was always linked directly to agriculture;
- 34 per cent expected to improve their ability to make farming a professional business;
- 31 per cent expected to gain the ability to teach others post-training either within their network and/or community;
- 31 per cent wanted to network with others;
- 26 per cent expected to improve their household food security;

- 23 per cent expected to improve their finances and wealth;
- 20 per cent expected to improve their current farming methods;
- 11 per cent expected to increase their personal food production and lastly; and
- 11 per cent expected a space and opportunity to exchange ideas with other farmers and industry experts.

This study focused primarily on women; therefore, it was a research priority to conduct semi-structured interviews with all 21 female participants. The goal of the research was to conduct interviews with all of the female October 2013 training participants; however, this was unachievable due to some women not being willing to participate. If time permitted, I wanted to conduct the same interviews with the male participants to provide a varied perspective and possible comparative data. Given that the purpose of this research was to understand each participant's personal profile and farming practices, a list of questions was formulated and asked to the training participants with the aim of better understanding their current situation. The questions focused on gaining insight into participant's current farming practices and techniques used, reasons for farming, long-term goals for farming, clarifying family or community support, and employment status. (See appendix 3 for a list of questions asked to the October 2013 training participants.) To avoid disrupting the training, interviews were done during breaks, which also added time limitations.

Prior to each interview, it was explained to the participants that their names would not be used and they would only be identified by their gender and age. The interviews were semi-structured and allowed for the interviewees to provide additional details beyond the standard list of questions. The questions were open ended and provided opportunity for participants to give detailed answers. A limited number of questions were asked to ensure the experience was not overwhelming for the participants. The interviews were conducted in English. Swahili is the native tongue for a majority of Kenyans; however, English is an official working language for

many people living in Nairobi. For 75 per cent of the interviews conducted, language was not a barrier; however, for the remaining 25 per cent English language proficiency may have obstructed the participant's ability to provide comprehensive and thorough answers. Interviews with female participants were held in a private location away from male participants. Prior to the field research, secondary research revealed potential threats and influences of cultural dynamics between men and women. Specifically, women traditionally do not feel they can speak freely in front of their male counterparts, and, therefore, for the purpose of accuracy in the research, it was important to remove any such potential influences (Lee-Smith, 1997).

The first three interviews were conducted in a small group setting, of approximately three women at one time, to help ensure comfort and a safe space throughout the process.[4] However, a concern of confidentiality was raised as the women started to share very personal and often tragic stories driving their participation in this training. For instance, one female participant disclosed openly in the interview that she was HIV-positive and due to that personally facing many obstacles. Another woman admitted to the recent loss of her husband and at the age of 65, was now required to learn how to operate her family farm for both subsistence and market production. Each woman had a story that was personal and often driven by tragedy, hardship and the desire to improve her current situation. Given the very private details shared by some participants, every effort was made to have individual meetings thereafter. To summarize, the methodology and research processes used to collect data from participants were planned and designed prior to arriving in Nairobi. However, due to unforeseen factors, such as the sharing of

[4] For the purpose of this study, a safe space is defined as, a place where a person can feel comfortable to fully express themselves, without the fear of being unwelcome, unsafe or judged on the account of their opinion, belief or personal circumstance.

private information or the unwillingness of all female participants to take part in the semi-structured interviews, adjustments were made as needed.

3.3.1 Training Participants: Understanding their current situation and motives for farming

Attending the one-week training was an important research opportunity for understanding the profiles and circumstances of the training participants. It allowed a space to speak directly with them, to understand in depth their individual circumstances, and what drives them and their urban agricultural goals. It was expected that 28 people would register for the October 2013 training; however, 38 was the final number of people registered which exceeded Mazingira's expectations. More participants showed up on the first morning of the training than were originally selected and Mazingira tried to accommodate that demand. This demand is linked to a growing number of urban farmers within Nairobi; individual need for training to improve farming practices with the aim of better production; and the fact that Mazingira has developed a positive reputation throughout Nairobi and Kenya as the best training provider for urban agriculture. Another reason for the popularity of the training is due to government buy-in, participation and support for the training. Agriculture extension officers participate in the training as trainers and facilitators. Extension officers are paid professional government staff members that, until recently, worked for the Ministry of Agriculture, Livestock and Fisheries.[5] Their primary role and responsibilities are to support farmers while monitoring and helping improve farming practices. Having extension officers engaged in the training was an explicit goal of Mazingira's from early on and was very important, given that resistance to urban agriculture in the city from the government still remained. Figures 2 and 3 are of two female

[5] Since the introduction of the new constitution in Kenya in late 2010, responsibilities for agriculture have been slowly devolved to the counties. As of 2013, extension officers were transitioning from national to County employees.

facilitators from the October 2013 program at Mazingira, conducting training in a traditional class room style setting. Figure 2 is of a former extension officer who now works fulltime supporting her son as he grows his quail business. Figure 3 is showing the common presentation style used by extension officers.

FIGURE 2: Urban Farmer

FIGURE 3: Extension Officer

Mazingira does not place any restrictions on the age of participants. The average participant age was 36; the youngest participant was 19; the oldest was 65. Tables 1 and 2 show the breakdown by age and gender. Over the years, Mazingira has identified that if participants are too young, are heavily involved in school and extra-circular activities or at an age where they are easily influenced by their peers, they tend not to be as successful in achieving their business plan post-training as other participants.

TABLE 1: Ages of Training Participants

Age	Number of Participants
Youth (18 - 35)	18
Non - Youth (36+)	20

Achieving a balanced gender grouping was intentional when selecting the participants for the October 2013 training. It is an important goal for Mazingira to offer this opportunity to men and women equally, given their differing and important roles in a household and greater society. There were fractionally more women present in the October 2013 training than men.

TABLE 2: Gender Divisions of Training Participants

Gender	Number of Participants
Men	17
Women	21

When selecting participants for the training, Mazingira's goal is to select individuals who have Secondary education credentials or lower. Table 3 shows the level of education for each trainee. Financial levels of participants are difficult to measure but Mazingira tries to provide training opportunities to lower income individuals or those who work with at-risk youth and older adults. In the October 2013 training, 18 participants had some form of post-secondary education.

TABLE 3: Education Levels of Training Participants

Educational Level	Number of Participants
Primary (grades 1-8)	3
Secondary (grades 9-12)	16
Post-Secondary (College/University)	18
Other	1

Table 4 shows that 19 participants categorized themselves as farmers. Individuals selected more than one occupation if applicable. Only two participants listed themselves as unemployed. The participants in this training were not of the lowest socio-economic demographic in Nairobi, Kenya; instead were positioned in a lower to middle income household.

TABLE 4: Occupation of Training Participants

Occupation	Number of Participants
Work for Pay	2
Run Small Business	13
Farmer	19
Homemaker	3
Searching for Work	3
No Work	2
Student	1
Volunteer	1

Table 5 identifies where participants lived. The residential locations of participants include all eight former Nairobi districts and surrounding peri-urban areas. (Since the new constitution, Nairobi County is divided into fifteen sub-counties. Districts are still commonly referred to as the organizational structure of the city). The most represented district was Embakasi, where ten participants reside. Embakasi is located east of the central business district and houses mostly lower middle income citizens. (See Figure 4 for a map of the County of Nairobi). Two farmers from the distant coastal city of Mombasa, Kenya were also invited to join the training.

TABLE 5: Residential Locations of Training Participants

Residential Location	Number of Participants
Westlands (Larger Property Size)	7
Langata	1
Makadara	1
Starehe	3
Kasarani	1
Kamukunji	1
Embakasi	10
Dagoretti	3
Peri-Urban	9
Mombasa (Coastal)	2

Figure 4 is a map of Nairobi County and indicates the residential locations of majority of the 2013 training participants, excluding Mombasa.

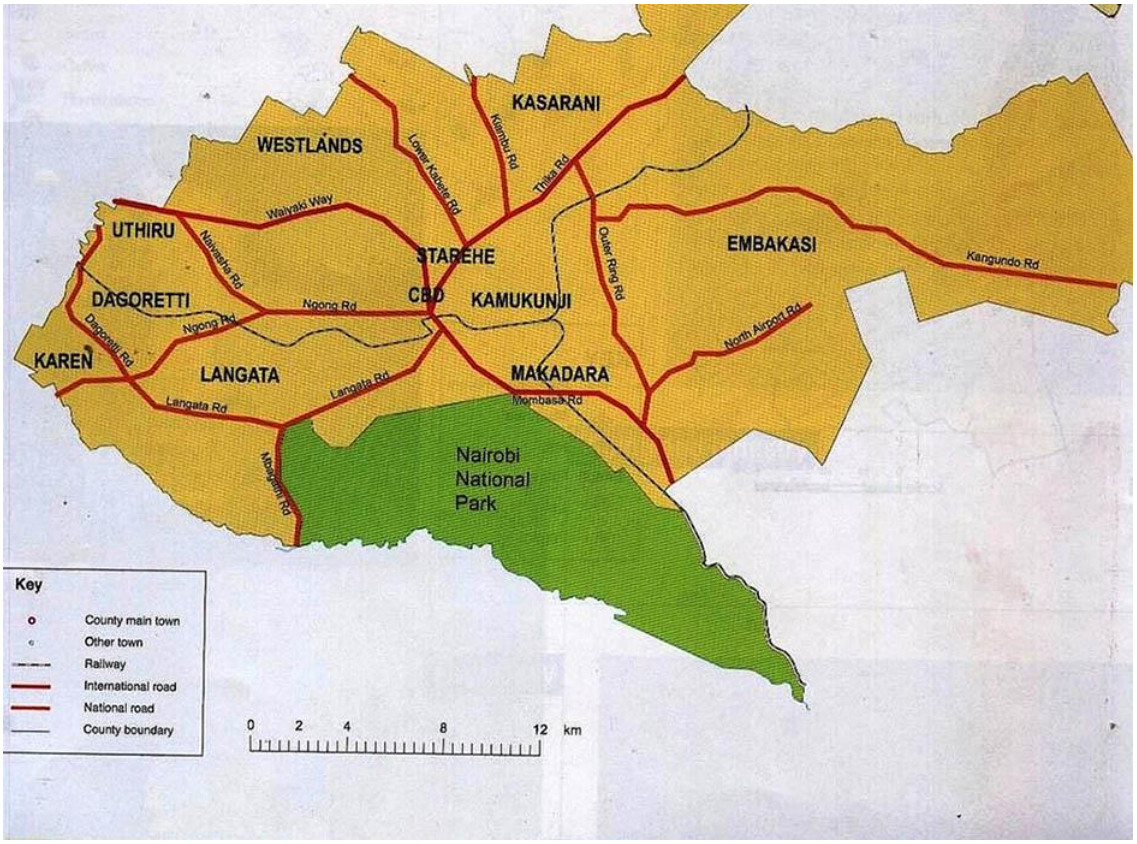


FIGURE 4: Map of Nairobi County
(Nairobi County Medical Office 2014)

Thirty-five participants in the training had access to land they could use for farming. The majority of participants identified residential as the type of land available to them (Table 6). The available land varied in size, often based on the neighbourhood they reside in. Unfortunately, it was not possible to collect data on the size of the land plots available for farming. Access to land, even a small plot, is perhaps the most valuable asset for an urban farmer.

TABLE 6: Farmland Used By Training Participants

Type of Space	Number of Participants
Residential (House)	28
Organizational (School, Church)	3
Common (Owned by a Group)	7
Open (Public Land)	6
No Response	3

While practicing farming is not a requirement to participate in the training, Mazingira staff recognizes that people already engaged in farming are typically much more likely to implement their post-training plans than those who do not already farm. The types of farming practiced by the trainees also varied among participants. Table 7 shows that many farmers are involved in more than one form of agricultural production and some are involved in food processing highlighted in Table 8.

TABLE 7: Farming Involvement of Training Participants

Category of Farming	Number of Participants
Animal	24
Fish	1
Crop	25
Waste (Compost/Manure within Crops)	9
None/no response	2

TABLE 8: Food Processing Used by Participants

Type of Product	Number of Participants
Dairy (Milk, Yogurt)	7
Animal (Poultry, Rabbit Meat)	17
Crop (Dried Vegetables, Herbs)	10
Miscellaneous (Jam, Peanut Butter)	6
Waste (Compost, Skins)	8
None/No Response	7

Table 9 shows that 33 of the 38 participants lived in a household engaged in farming. The five participants who did not respond most likely did not engage in farming at the time of the training. Twenty-one participants did mixed farming, a combination of subsistence and "for market" production. Women tend to hold the primary responsibility of providing food for their household; therefore if a woman is farming for market she will also farm for subsistence.

TABLE 9: Farming Households of Training Participants

Type of Farming Household	Number of Participants
Non-Farming	1
Subsistence (Household Consumption)	10
For Market (Sale)	1
Mixed (Subsistence and Market)	21
No Response	5

Participants who register for Mazingira's training can be involved in multiple facets of farming. However, in the October 2013 training, a majority of participants engaged in two features related to distribution. The most common type of food distribution is direct sale, which 14 participants do. Sixteen participants do not sell what they produce and keep for their own use. Eight participants were involved in the packaging, storing and transporting of a farming commodity (Table 10).

TABLE 10: Types of Food Distribution of Participants

Type of Distribution	Number of Participants
Packaging	4
Storing	3
Transporting	1
Direct Sale	14
None/No Response	16

To summarize, in the October 2013 training there were similarities exhibited among the group of participants. Their education levels, occupation, access to land, commodity farmed and reason for farming had the most commonalities. An intentional gender and age balance was achieved among the trainees, as is the common practice of Mazingira when recruiting participants. It became very evident during the interviews that there were commonalities among the female participants. Below, four brief profiles of female participants are presented. Each of these is generally representative of a similar group of women in the training.

3.3.2 Female Training Participants: Four common profiles based on individual circumstances, experiences and farming goals

The following section describes four common profiles of women from the October 2013 urban agriculture training. The profiles were primarily based on their personal and professional circumstances and experiences as well as their expectations post-training and farming goals.

Participant E is a 62 year old female and retired civil servant with an aim to earn more income to support her family than her pension provides. The chickens she currently owns do not provide enough food for those that depend on her, such as her children and grandchildren. She took an interest in farming and had a desire to know more. Her son saw a young female urban farmer on television and told his mother about her. She went to visit this young farmer to learn more about what she was doing. Participant E wants to be self-sufficient and independent, to develop a profitable business and "be empowered" (Participant E, Thursday 17 October 2013).

She also explained her concern for the widows in her neighbourhood – they are worrying about their own food security now that their husbands have passed. One of her reasons for joining the training was to gain practical farming skills, and then use that knowledge to teach and train her fellow widows. She wants to give them a purpose for this half of their life and also help them learn the skills to develop their own profitable business. Her biggest challenge is the high cost of water. She envisions having a borehole one day. Another challenge is that the size of her plot is small and she would need many inputs to start her farming business. She stated, "I want to see my life boosted!" (Participant E, Thursday 17 October 2013).

Participant F is a 45 year old female, occupation unknown. At first, the goal driving Participant F's attendance was to learn more about farming; however, "because the training has been a real eye opener" she can see an opportunity to make a serious business out of farming (Participant F, Saturday 12 October 2013). She is currently living with HIV, as are many of her friends. She chairs a support group for women living with HIV and feels that there is a lot of discrimination against people living with HIV. According to her, there is a lot of funding going towards prevention campaigns and awareness but little support for the people actually living with the disease. She believes that support is a major obstacle in the personal development and empowerment of persons with HIV and therefore wants to help others overcome that challenge. Her goal after the training is to teach others living with HIV and show them they can make their own living through farming. She would like to remove a dependent way of thinking among her friends and teach them that farming can allow them financial independence and a healthy food supply. Since attending the training, she believes this is possible. She is currently farming rabbits, chickens, goats and green vegetables on a small scale. Her main challenge is attaining the right information and knowledge to improve her farming practices.

Participant G is a 39 year old female and biblical study student, who volunteers her time at her local church. There she assists in a program that teaches and feeds at-risk youth from slum neighbourhoods. She heard about Mazingira through a colleague and social worker at the church who graduated from the training last year. Her goal for the training was to learn more about farming, specifically the practical techniques. In Kenya, primary education is free; however, secondary is not. Particularly in low-income areas, families are unable to afford to send their children to school post-grade eight. There are a large number of children with no activities to fill their time and they are ultimately getting into trouble. These children are the primary beneficiaries of the program she volunteers with. Due to the high food costs it was getting difficult to feed the children in the program. She plans to return to her organization and help her colleague develop a large farming business at the church. She wants to sell some of the food to generate profit as well as help improve nutrition levels for the children. She also wants to teach the children farming skills, so they can make their own money. Their current farm has four pigs and a few chickens. They are interested in mixed farming. The major challenge for the program and leveraging their current farm is attaining capital and finances. Accessible water supplies are not always an option and it is very expensive to supplement water. Security is also an issue – they are looking for a guard to protect the farm as it is located in an unsafe area of Nairobi.

Participant H is a 22 year old female and recent University graduate. Participant H is currently farming quails and domestic chickens with her mother. They recently started farming on their small urban plot. She finished school with a human resources degree but was unable to secure a job and then saw the potential in farming. She would like to turn her urban farm into a large business. According to her, jobs now are harder to secure and farming is making money. Among her age group, farming is now viewed as a competitive and lucrative business. She has

joined the training to know more about farming and she hopes it will help her personally succeed in her industry. Her long-term goal is to have a large profitable farming business and continue farming with her mother. She is also interested in training others once she has increased her own skills. The main challenge she experiences is the rising cost of feed for livestock.

This section illustrates that all of the October 2013 training participants are unique individuals, with distinctive circumstances and life experiences. They have different goals, expectations and varying ideas of what they want to get out of the training in order to move forward in their life. When viewed as a larger collective group, there are commonalities among the training participants; however, in order to meet the needs of each individual it is important to recognize their diversity.

3.4 Key Informants: Group 2 - Past Participants (Graduates of the Training)

The next group of key informants were past participants who had graduated since the training's inception in 2004. This group was not homogenous and varied demographically. During the field research, semi-structured interviews were conducted with seven male and six female past participants. Mazingira suggested the individuals and helped secure the interviews. As a result, these interviewees represent people who have been successful post-training and now lead a farming business. I was unable to conduct interviews with persons who were not successful post-training, simply due to the inability to find these individuals.

Interviews with past-participants were conducted in order to explore and understand the impact the training had on them in relation to four areas – social and financial well-being, quality of health, and technical farm practices. These interviews also followed a semi-structured format to allow participants to pursue lines of argument or reflection as desired. Each person was asked the same group of questions, which were similar to the questions asked of the October 2013

training participants. Additional questions related to the impact and changes or advancements in the areas of social, financial, technical and health were added. For instance, each individual was asked if they experienced growth in their business post-training. In addition, inquiries were made in order to understand if they felt more financially stable, had changed their farm practices (particularly in terms of cleanliness or hygiene), and lastly if they felt their social network within the agricultural industry had improved or changed. (Refer to Appendix 5 for a complete list of questions asked to the past training participants.)

3.4.1 Farm Site Visits of Training Graduates

With the assistance of the Mazingira Institute staff, four farms of past participants were visited. The urban farms were owned and operated by past training participants who have improved their level of farming since completion of the program. Each farm had differing characteristics, such as varied farming techniques and harvest produced. The opportunity to visit urban farms contextualized the training and provided an opportunity to view the many innovative farming techniques implemented post-training. It allowed a space to observe an authentic urban farming environment while at the same time allowing dialogue with the farmers in a less structured setting. In addition to site visits, interviews were conducted with an additional nine past participants. Of the 13 past participants interviewed, three common profiles emerged. The three profiles were primarily based on commonalities in personal and professional circumstances and experiences as well as farming goals and achievements post-training. The three following participant profiles are representative of the experiences of the other 13 graduates interviewed.

Past participant B is a 50 year old female. She farms her privately owned property which is approximately 9 x 30 meters in size. Figure 5 is an aerial view of her urban farm. The figure

shows a large homemade chicken coop and large water tank. The water tank is filled regularly and used to support crop production and livestock health.

FIGURE 5: Urban Farm Located in Nairobi, Kenya

A 2006 graduate, past participant B lives in the Utawala neighbourhood, which is considered ‘urban’ but felt less dense and more peri-urban than other areas visited. She began farming shortly after her children were born as it became quite important to her to generate an income to support her family. She farms chickens (for eggs), various vegetables (rooftop) and catfish (for meat). Her primary focus is on value addition, more specifically preserving jams, peanut butter and tomato sauce. She purchases the food used for preservation from local farmers. This farmer has developed a very sophisticated and impressive chicken coop that houses roughly ten chickens and two roosters. The chickens produce five to six eggs daily, which she uses for her own household consumption, while any extras are sold to close neighbours. The manure produced from the chickens is mixed in with organic matter to create organic compost that is applied to her rooftop garden. Figure 6 shows the outside of past participant B’s chicken coup.

FIGURE 6: Chicken Coup

The farmer also harvests catfish in a large homemade outdoor pond (4 x 1 x 1 meters). The pond can house 150 catfish, a common protein source in Kenya. Past participant B explained that her main challenge is affordable water supplies. She has access to a ground pipe that supplies water, which is connected to a large water tank (10,000 litres). This is an expensive option and eats into the profits she earns.

Past Participant C is a 50 year old male who farms his privately owned property in a peri-urban neighbourhood, size unknown. He grew up in a farming family, producing maize, wheat, cotton and varied fruits. When he was old enough to leave Kenya, he traveled to Saudi Arabia to work for a food shipping company – still working within the food system. When he returned to Kenya, he connected with the founders of Mazingira in early 2000. At the time, the Mazingira team was working on turning garbage heaps into quality soil for use by urban farmers. They would begin by removing the plastics and then compost the remaining waste. This farmer joined their team and helped them with this waste management project. During his time working with Mazingira he realized that there was a strong potential for urban farming and began advocating and promoting Mazingira's training. He was part of the first team of trainers. On his personal farm, he grows corn flower, micro greens and broccoli. He is always seeking out unique products

as he sells to an upper and more affluent market, including residents and restaurants in Westlands – a higher income residential area of Nairobi.

Past participant D is a 64 year old male and farms in the Utawala. This large shared plot is public estate land and was offered to the farmer from the previous owners who could see the value in urban agriculture practices but no longer had a personal interest in the land. The land is divided into eight portions. He uses the largest parcel of land as compared to other past participants, which is approximately 1/8 of an acre and the seven remaining ones are offered to interested community members for their use. When the farmer first started practicing urban agriculture, society viewed this practice as a nuisance and discreditable. He stated openly that "if he wanted to be taken seriously, that he needed to have a much more sophisticated and professional approach" (Past Participant D, Saturday 12 October 2013). Presently, he harvests various vegetables, fruits and herbs (many with medicinal purposes), 480 rabbits (for meat), 6 goats (for milk), approximately ten chickens (for meat and eggs) and roughly 20 guinea pigs (for meat). The farmer has developed a sustainable cycle for his business which helps lower his input costs. For instance, his plant harvest produces seeds to cultivate and expand his growth; rabbits eat organic garden waste; and the rabbit waste is used to fertilize the garden. He sells excess rabbit manure to other farmers, which creates an additional revenue stream. He also uses biological and organic pest and disease control methods and alternate planting techniques to maintain soil quality. This farmer identified rabbit meat as his primary and most lucrative commodity. Figure 7 shows past participant D explaining the farming techniques he uses to keep his rabbits. Figure 8 shows the smaller rabbit stalls which each hold 2-3 rabbits.

FIGURE 7: Rabbit Farmer

FIGURE 8: Vertical Rabbit Cages

In addition to his own personal distribution to the community, the farmer supplies a local supermarket with rabbit meat, each rabbit fetching 700 to 1000 KES ($8.00 - $11.00 USD). The rabbits have very low input costs and live for four to six weeks depending on the gender. The farmer slaughters approximately 16 rabbits per weekend ($128.00 to $176.00 USD). This gross sales calculates to roughly $9,152.00 USD per year. The most difficult challenge the farmer has with rabbit production is keeping up with demand. The farmer also explained that goat milk was a very profitable business. Each goat produces 1.5 to 3.0 litres of milk per day, which sells for an

average of 200 KES ($2.25 USD) per litre. To help balance the demand, the farmer requests that his customers place their order in advance.

The farmer's primary challenge is water. He uses a drip watering system which is connected to a rain barrel; however, due to issues of severe drought at the time of this research, it was not currently in use. He will not use sewer water due to industrial and biological waste and contaminants and the tap water is unusable due to high levels of chlorine. Therefore, the farmer purchases bottles of water which is an expensive input cost.

It was important to interview past graduates of the training to gain insight into their pre and post personal and farming realities. Participant observation was a key research method used and proved to be very important for data collect, allowing for a first person observation of the realities and mix of practices in Nairobi.

3.5 Key Informants – Group 3: Professional Government Elite

The third group of key informants was made up of government elites, who serve as Agricultural Extension Officers for the Ministry of Agriculture, Livestock and Fisheries. Their primary role as paid staff is to work directly with farmers helping them to improve their farming practices; however, in the context of the farmer training they served as trainers. Extension officers are now very engaged in the training Mazingira offers and show great enthusiasm for the training. (Personal Communication, Diana Lee-Smith, Friday 18 October 2013). They were interviewed individually and asked a set of questions based around urban agriculture. More specifically, the officers were asked if they felt urban agriculture could contribute to overcoming Nairobi's food security issues. They were also asked about the role of women in urban agriculture and if they felt that women could contribute to overcoming Nairobi's food insecurity. Lastly, they were asked what impact they felt the Mazingira training had on individuals and their

own personal food security. (Refer to Appendix 10 for the complete list of questions asked to government elite.) Due to time restrictions, it was decided to only interview the female Extension Officers; however, both female and male Extension Officers were observed throughout the training. The results derived from these interviews with government elite are presented in chapter four.

3.6 Key Informants – Group 4: Professional Non-Government Elite

The final group of key informants interviewed consisted of non-government elite, specifically Mazingira's co-founder Diana Lee-Smith as well as two members of staff at the Mazingira Institute. They are all community leaders and paid staff. Staff member B is also an urban farmer. The questions for Diana Lee-Smith, the co-founder of Mazingira, were much broader and more complex but fit within the areas that this study was framed. Based on her high level of knowledge and experience in the fields of gender, land and property rights as well as urban agriculture, it was decided that asking questions tailored to her expertise would be of value to the research. The questions asked to Diana Lee-Smith focused on the role of women (historically and in present day) in Nairobi, difference in agriculture related knowledge between men and women, housing developments and urban planning in Nairobi, and lastly revisions related to Kenya's most recent constitutional change and the reasons igniting the review. (See appendix 6 for the complete list of questions asked to Diana Lee-Smith.)

The questions asked to the two members of staff focused more on the training participant selection process, training programme structure, post-training follow-up and recommends on how to improve future trainings. They were also asked to provide personal insight on the impact this training is having on participants and if they felt there were particular assurances for the long-term success of a training participant. A formal semi-structured interview was only possible

with staff member A. Unfortunately, due to staff member B's significant commitment and key role in the training, he was unable to participate. (See appendix 7 for a complete list of questions asked to Staff Member A.) On Saturday October 12th, 2013 an opportunity to visit Staff Member B at his home was provided. He showed me his urban farm and during that site visit he was asked questions pertaining to the training participant selection process.

To summarize, Table 11 shows the number of interviews conducted with each group during the 18-day field visit.

TABLE 11: Key Informant Groups

	Female	**Male**
October 2013 Training Participants	16	7
Past Participants	6	7
Government Elite	4	0
Non – Government Elite	2	1
Total	28	15

In addition to semi-structured interviews, participant observation during the training was also done as a research collection tool. Through participant observation common questions and issues of discussion among the group could be identified, as well as observing which participants were most and least engaged. General observations were also made during interviews with past participants, extension officers and during my attendance at the Nairobi World Food Day.

CHAPTER FOUR: URBAN FARMING IN NAIROBI: RESEARCH FINDINGS

The following chapter presents the main findings of this study and examines the immediate impact of Mazingira's urban agricultural training among a small group of female urban farmers. It begins by providing a brief historical and contemporary overview of urban farming in Nairobi, Kenya. The section uses qualitative information to illustrate the challenges, opportunities and benefits of urban agriculture in Nairobi through the eyes of people thinking deeply about urban agriculture in the city – recent and past participants of urban agricultural training. The research reveals that the training appears to produce short and long-term benefits to women along the four dimensions examined: social well-being, financial well-being, household health benefits and improved technical farm practices. At the same time, the results reveal that even with these benefits, not all key informants agreed that the benefits of urban agriculture outweigh the risks, particularly in terms of contamination and hygiene. Specifically, extension officers interviewed showed a clear concern with the risks and methods of farming practices. Owing to the small number of interviewees, and the absence of interviews with training participants that did not benefit, these results are only suggestive. For the findings to have more weight, a more representative and random sample of interviews would be needed in future.

4.1 Introducing Nairobi: Urban agriculture historically and in present day

Nairobi, the capital of Kenya, is located 500 kilometers from the coast, in the southern part of the country, and has an elevation of 1670 meters above sea level (Hide, Kimani & Kimani Thuo, 2001). The city covers an area of 700 square kilometers. Nairobi was formally divided into eight districts: Makadara, Kanukuniji, Starehe, Lang'ata, Dagoretti, Westlands, Kasarani and Embakasi (Hide et al., 2001; Njenga et al., 2010), but is now divided into fifteen sub-counties, which are then divided into individual wards. In 2012, the population of Nairobi was estimated at

three million people, with an annual growth rate of 4.5 per cent (Njenga et al., 2010). The mean annual temperature is 19°C, with a climate characterized as modified equatorial (Makokha & Shisanya, 2010). Rainfall follows seasonal patterns, with the "short" rains between October and December and the "long" rains falling between the months of March through May (Hide et al., 2001). This leaves many farmers to rely on irrigation during the driest months of June until September (Hide et al., 2001). However, with the absence of irrigation for rural and urban farmers, access to water is a major problem.

Sixty per cent of Nairobi's population resides in low-income informal settlements, with poverty levels fluctuating from 60 to 78 per cent and the numbers of urban poor projected to increase by 65 per cent through 2015 (Njenga et al., 2010). Unemployment stands at 14 per cent for men and 24 per cent for women, which indicates a disparity between the opportunities for men and women to secure employment (Njenga et al., 2010). Anecdotally, women interviewed for this research thought that the city's population of urban poor is increasing, opportunities for casual work are decreasing, and daily meals are becoming more difficult to secure. From the outside looking in, Nairobi is a city buzzing with an entrepreneurial spirit, but still so obviously struggling within a complex web of poverty.

In the mid-1980s, Nairobi's population was around one million, with 20 per cent of households growing crops and 17 per cent keeping livestock within city limits (Njenga et al., 2010). In the 1990s, it was estimated that 30 per cent or 150,000 households were practicing urban agriculture (Njenga et al., 2010). In 1998, the number of dairy cattle alone in Nairobi had climbed to 24,000, which collectively produced an estimated 42 million litres of milk in addition to the 50,000 bags of maize and 15,000 bags of beans also produced within the city annually (Njenga et al., 2010). Research shows that urban agriculture has become more common and

progressively grown into an important activity to minimize food insecurities and improve income for urban residents.

One middle-aged non-farming male that I met in the course of the research stated that Nairobi residents are showing a preference for purchasing their food directly from the farmer rather than a commercial outlet in order to gain better prices and fresher products (Personal communication, Taxi Driver, Saturday 12 October 2013). Naturally, foods produced from the rural areas are more expensive due to the costs of transportation, making urban grown food more accessible for low income families. The advantages of urban agriculture were largely the lower risks of starvation or malnutrition for individuals and their families who otherwise do not have adequate incomes to support themselves (Freeman, 1991). For many years, households in Nairobi would practice urban agriculture informally as a means of subsistence. As the number of participants grew, it became increasingly important for the government elite to accept and support urban agriculture at least tacitly (Prain & Lee-Smith, 2010, p.13). Due to the increasing number of households farming and the undeniable benefits of secure food sources, urban decision-makers have recently begun to recognize urban agriculture as a livelihood strategy (Prain & Lee-Smith, 2010, p.13). Figure 9 shows a large bulletin advertising the importance of practicing urban agriculture in response to achieving food security. This bulletin was located in an exhibit at the 2013 World Food Day held at Jamhuri Park, Nairobi, Kenya. This advertisement promotes a positive message to residents of Nairobi with regards to urban agriculture and its ability to achieve food security. This bulletin was located at a public event hosted by the Ministry of Agriculture, Livestock and Fisheries, therefore, openly indicating that the national government supports urban agriculture. This provides evidence that urban agriculture is shifting away from the negative perception it had historically.

FIGURE 9: 2013 World Food Day Bulletin

According to Lee-Smith, there has been an attitude shift among government elite but there is still skepticism around whether policy makers truly understand what urban farming is, and a concern among industry experts that this uncertainty can affect the support offered to farmers (Personal Communication, Diana Lee-Smith, Tuesday 15 October 2013). During the Mazingira training, participants voiced their frustrations with government response to urban agriculture. They made it clear that past city councils were not supporting or helping them with their practices, which confirms the potential disconnect Lee-Smith shared. It is important to note as Cole, Lee-Smith & Nasinyama (2008) remind us in their publication *Healthy City Harvests*, that local and central governments are obliged by law to respect the Right to Food. This means that in principle, and according to the United Nations, authorities are unable to stop people from providing themselves with food essential to their survival (Prain, Lee-Smith & Cole, 2008).

Farming in Nairobi is rich with history, and yet has been linked to negative and unattractive stereotypes, but this is changing. For many years, young people viewed farming as merely a lifestyle for low-income individuals; however, according to one successful female urban farmer, Nairobi is changing and so is the desire to farm (Past Participant F, Saturday 12 October 2013). The perception that youth are becoming more active in urban farming in Nairobi was often mentioned during interviews with past graduates. In particular, one successful urban

farmer and past training graduate felt that youth involvement is becoming more sustainable and the demand for young people to attend urban agriculture training is changing and increasing. He believes this is because the recent perception of farming is changing and young people are realizing that there is money to be made, therefore, taking it more seriously (Past Participant C, Tuesday 22 October 2013). Historically and over the past few years, the information technology industry has dominated university enrolment for young people (Past Participant A, Sunday 3 November 2013). However, as the perception of farming shifted and it was seen as a source of a rewarding income, in parallel to an increasing need for food security, more and more young people are showing an interest. As a result, younger generations are becoming more engaged in urban farming.

One female past graduate interviewed is recognized as one of the most successful vertical farmers in Nairobi. She is approximately 30 years old and began farming at a very young age but intensified her efforts after she graduated university. She focuses primarily on rabbits and value addition (i.e. minced rabbit meat to make sausages). She received the District Award for "Best Farmer" in 2010, a significant accomplishment. She believes that urban agriculture can help address Nairobi's food security problems and thinks that youth need to be more engaged to make the largest impact. According to her, youth in Nairobi are flexible and open in their way of thinking in addition to their engagement in social media and technology (Past Participant A, Sunday 3 November 2013). The general view among the informant groups interviewed was that the number of people engaged in urban agriculture in Nairobi is steadily increasing. Yet the city remains challenged by the interwoven web of poverty and food insecurity. Urban agriculture has been used to combat such issues for many years and still continues to mitigate food inadequacies

for households. With the continued growth of urban agriculture in Nairobi, the government's perspective and support towards this practice are shifting, but deeply rooted skepticism remains.

4.2 Benefits Verses Challenges of Urban Agriculture in Nairobi

Urban farming has an important role to play in mitigating food insecurity in Nairobi. Despite the perceived benefits of urban agriculture, there are still many issues that limit the expansion and quality of food produced in Nairobi. One central issue relates to contamination and the quality of agricultural produce and livestock. Many of the past graduates, current training participants and government elite interviewed for this study stated that they are nervous to eat food that could run the risk of contamination and be potentially harmful to their health. They were also concerned about risks of contamination and the effect these perceptions may have on urban agriculture in Nairobi. The farmers involved in this research understood how the perception of contamination risks could negatively impact their urban farming business. One government elite felt that if contamination concerns were not addressed, expansion of urban agriculture will experience limitations (Government Elite A, Former Nairobi County extension officer and urban farmer, Thursday 17 October 2013). A past graduate stated that he felt urban agriculture could assist with Nairobi's food insecurities and has the potential to supply 70 per cent of the city's food source. However, according to him, water for production use is still a major barrier as not all neighbourhoods are connected to city piping, resulting in grey water use, which poses major contamination threats. A certain level of concern regarding contamination might be expected, but the level of distress over this factor was rather high among this study's key informant groups.

When improperly managed, urban agriculture is occasionally practiced in public areas unsuitable for housing, such as road verges, banks of drainage channels, wetlands and

contaminated sites such as scrap yards and dumpsites for solid and liquid wastes (Nabulo, Oryem-Origa, Nasinyama, Cole & Diamond, 2008). Growing food in these locations is more common for the poorest groups practicing urban agriculture and utilizing high-risk areas whose toxic history is known (Nabulo et al., 2008). One reason poor farmers use contaminated areas is due to a lack of options (Nabulo et al., 2008). The participants from the October 2013 training were not Nairobi's poorest and do have access to land where they could safely practice urban farming. Therefore, their primary concern related to contamination was through the use of biological wastewater, which comes from ordinary living processes such as bathing, toilet flushing, laundry and dishwashing. Twenty-five per cent of the training participants interviewed in October listed a reliable water supply as a main challenge.

The concern with contamination is the principal infectious agents found in domestic wastewater that can lead to gastrointestinal infection in humans and animals (Nabulo et al., 2008). Sources of microbial pathogens can come in contact with fresh produce at the pre-harvest stage, via human handling, during transport and through unhygienic practices (Lagerkvist, Hess, Okello & Karanja., 2012). Whereas automobile emissions, industrial outputs and municipal waste are common contributors of toxic metals in soil which can be absorbed by plants (Nabulo et al., 2008). It is important to recognize that unlike metal contamination, microbial pathogens are not taken up by plants when growing (Nabulo et al., 2008). If produce is cleaned and handled properly, and wastewater is treated effectively, this source of irrigation can act as a safe alternative. Nabulo et al., (2008) clearly support and confirm the need for an array of potential strategies to be implemented for a better management of the considerable and dangerous health hazards associated with biological contaminants. When understanding this health risk the reuse for fertilizers is often unknown; disease outbreaks are difficult to trace back to specific practices,

and, developing countries tend to have other health-research targets (Furedy et al., 2011). While conducting interviews with informant groups, it became obvious that avoiding contamination while practicing urban agriculture within lower income households is incredibly complex. Due to the nature of such complexities, the topic of contamination was not discussed in depth with informants. However, interviews with government elite found contamination to be a significant concern for them and that not all were in agreement that the benefits outweigh the risks.

A former Ministry of Agriculture extension officer with expertise in cattle and now a successful urban farmer stated that urban agriculture could help solve part of Nairobi's food insecurity problem but not its entirety (Government Elite A, Former Nairobi County extension officer and urban farmer, Thursday 17 October 2013). She notes that the physical conditions within the city are unsuitable to agriculture pursuits, making it challenging to grow produce that is safe for consumers. She feels that heavy metal contamination and bacteria from biological waste must be addressed and coupled with safety measures. She openly stated that contamination and food security require parallel attention to avoid introducing disease. Furthermore, she believed that if the City of Nairobi commits to dealing with safety and contamination, then they could solve food security issues for the average citizen. She argued that if the City of Nairobi was serious about scaling up and expanding urban agriculture to meet its food security demands, then management of crop placement and safe irrigation would need to be properly addressed: "Whatever changes we [Kenya] go through in our development we will always need food" (Government Elite A, Former Nairobi County extension officer and urban farmer, Thursday 17 October 2013).

A second extension officer with livestock expertise discussed issues of food handling, labeling and proper hygiene as weak features of urban agriculture in Nairobi. There is an

expectation that farmers will develop good communication with their local extension officer, a paid government staff whose primary role is to provide direct technical support to farmers in proper hygiene, handling and labeling, but unfortunately this is not a consistent reality. Interestingly, one past graduate and successful urban farmer stated during his interview that he does not see the value in extension officers and believes that they do not offer farmers the advanced knowledge they require to grow and improve their businesses. He also explained that farmers are the leading consultants in the agriculture industry in Nairobi and that their knowledge is outgrowing what extension officers can offer. He explained that his techniques and methods are taught through trial and error as well from knowledge and experience exchange with other farmers (Past Participant D, Saturday 12 October 2013). Whereas another past graduate confirmed that she is closely connected to her local extension officers and uses their services often for disease control and illness of her rabbits. However, she believes that extension officers require constant training to ensure that their knowledge remains advanced and superior within the industry and compared to the farmers they are supporting (Past Participant A, Sunday 3 November 2013).

The inconsistency in perspectives between farmers and extensions officers is one major finding of this study. There are many factors that explain the difference in perspective about the role of extension officers and about urban agriculture's benefits: farmers are not aware of the support offered by extension officers; farmers feel the service is inadequate compared to their own knowledge; and the high number of urban farms compared to the number of extension officers employed means that it is difficult for the two to connect easily. According to one extension officer, it is very detrimental to the health and quality of a food system when extension officers are unable to work directly with farmers in their designated area, are unable to assist

those farmers in improving hygiene and food handling techniques and gain a cohesive overview of farming occurrences. Furthermore, she feels that less sophisticated urban farmers are often not informed or practicing proper hygiene and food handling techniques not to mention labeling their food so consumers understand the area in which it was grown (Government Elite B, Nairobi County Extension Officer, Thursday 17 October 2013). She stated, "Information and attitude is knowledge" and this was a learning she hoped each participant would take away from the training (Government Elite B, Nairobi County Extension Officer, Tuesday 15 October 2013).

Kenya, like most developing countries, has had historically weak legal and policy frameworks of land ownership (Thuo, 2013). This has resulted in land development occurring in a haphazard manner and non-optimal use of land within the planned and controlled areas (Thuo, 2013). In the 2008 *City of Nairobi Environmental Outlook* report, it was estimated that approximately 13.9 per cent of urban land is used for agriculture and it is estimated that crops worth over $3.2 million KES are produced within Nairobi annually (United Nations Environment Programme: United Nations Habitat & City Council of Nairobi, 2008). For city and national government, these figures are difficult to ignore. A third extension officer interviewed, who holds expertise in pest management, felt that Nairobi does not have adequate uncontaminated space to allocate for traditional crops, especially in highly concentrated low-income areas, where food insecurity is at its highest (Government Elite C, Nairobi County Extension Officer, Friday 18 October 2013). However, she does believe that if the city was to "properly manage and coordinate" urban agriculture planning than integrated vertical farming has significant potential (vertical farming is a method of cultivating plant life using vertical incline techniques). Figure 10 and 11 show examples of the Ministry of Agriculture model of vertical farming used for training. Figure 10 is an example of vertical farming that houses three

commodities, kale on the top layer, chickens in the middle and catfish in the bottom layer. It is approximately 1.8 m x 1.8 m x 3.65 m in size. Figure 11 is an example of a vertical farm that houses kale and cabbage. It is approximately 1.8 m x 1.8 m x 3.65 m in size.

FIGURE 10: Vertical Farming

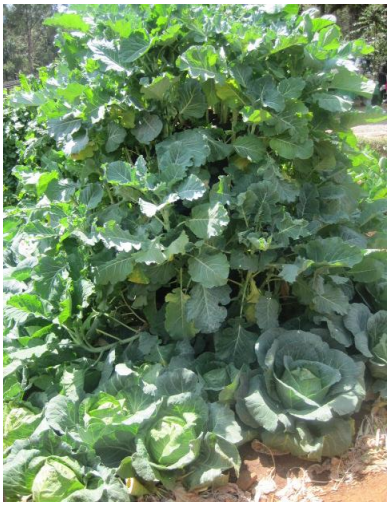


FIGURE 11: Vertical Farming

She also expressed the challenges of unfavourable city bylaws that do not support urban agriculture, water shortages, and contamination risk. Unfortunately, she did not specify which bylaw in particular she was referencing; however, this lends to a comment made by one past graduate when he shared the historical insight and experiences had by some of Nairobi's urban

farmers. According to him, during the inception of Mazingira's training in 2000, it was very difficult to get people to participate in the training. As a result, Mazingira started targeting older men in public housing. One major problem they faced was that many men housed livestock as their primary commodity and livestock (according to Nairobi by-laws) was illegal to have in city boundaries. These by-laws are now being revised, thanks in part to Mazingira and NEFSALF advocacy. What this demonstrates is that historically bylaws formally obstructed the advancement of urban agriculture.

She continued on to explain that, in her opinion, value addition to raw products was an opportunity for urban residents to generate income, compared to traditional primary production. Value addition is when taking a primary product and then changing it to add more value to it. It is to enhance or improve a product before offering the product to a consumer. An example is manufacturing peanuts into peanut butter, milk into yogurt, and strawberries into jams. It is important to note that Mazingira's training does also support the benefits and importance of value addition. The extension officer concluded that city dwellers would benefit most by placing themselves at the end of the value chain and not the beginning (Government Elite C, Nairobi County Extension Officer, Friday 18 October 2013). This is a very interesting observation made by an extension officer with a mandate to help and support primary food production. According to her, urban farmers are not engaged in the areas she feels they would most benefit from. This opinion illustrates that an extension officer may not be as supportive and enthusiastic about the benefits of primary food production as one would assume, based on their roles and responsibilities.

Interviews with government elite validate concerns with contamination and quality control issues related to urban agriculture but also expose mixed and conflicting opinions

pertaining to urban agriculture. Research illustrated that extension officers are much more conservative in their view of urban agriculture and its potential to assist in improved food security than any of the other key informant groups. This elevates the importance and need for continued research related to improving contamination and hygiene risks, supported by farming and non-farming stakeholders and experts. This also highlights the disagreement about the benefits of urban agriculture and whether these outweigh the risks involved.

4.3 Observations and Findings from the General Training

Mazingira's week-long training aims to improve the farming knowledge and skills of the participants, while expanding their social and professional network, teaching them the importance of conducting their farm practices as a business, and inspiring them to advocate for urban agriculture. The findings of this study reveal that the training is offering expertise and knowledge to assist participating farmers in achieving this aim. A male extension officer and training facilitator, explained to the training participants during his session on Farming Operations that, "You don't just become a farmer, you become a businessman" (Session: Farm Operations, Tuesday 15 October 2013, Mazingira Institute). Attending the October 2013 training allowed for direct contact with key participants and the acquisition of primary data about the training, the trainers, local experts, and about the role of the urban agriculture in the city. It also reveals that participating government elite agree that urban agriculture has the potential to improve Nairobi's food insecurity; however, despite the perceived benefits, not all are in agreement that the benefits outweigh the risks.

The training programme ran for seven days, running from 8:30 a.m. to 4 p.m., with an additional day at Nairobi's World Food Day at the Jamhuri Park Showground.[6] Many participants traveled a great distance to attend this training. One 65-year-old woman travelled by public bus each morning for three hours, leaving her house at 4 a.m. Two participants traveled from the coastal city Mombasa, Kenya, which is an eight-hour bus ride away, in order to attend the week-long training. There was an obvious sense of commitment and desire to participate in the training. Participants were offered a financial subsidy to cover the transport costs to and from the training. Each day consisted of three two-hour sessions taught by past participants, extension officers, and industry experts. At the end of the week, training participants were expected to present a business plan based on their initial agricultural goals with new guidance from the information they had been taught during the training. A final evaluation revealed that participants would like further information on value addition, vermicomposting, rabbit farming and entrepreneurship. Participants identified information technology and keeping quails as topics they felt were missing from the training program. A majority of participants also expressed the need for more practical, hands on training and the importance of visiting successful farms. Despite these desires, all participants felt that their expectations of this training were met. During each session, direct participant observation was conducted of the facilitators and the participants, with semi-structured interviews conducted during scheduled breaks.

Throughout the training, many moments revealed participants' interests, level of knowledge, common areas of challenge for the group, and contribution of training facilitators. For instance, when participants were explaining their personal dynamics and stories through

[6] For Further info refer to the NEFSALF Bulletin, Issue 20, November 2013 http://mazinst.org/files/mazpub/NEFSALF%20Bulletin%20No%2020-1_2.pdf

session discussions and feedback, it was clear that the majority have institutional or organizational support, whether it is their church, a local not-for-profit or a government program. Also, all participants had some usable assets, such as land and required inputs. Participant K supported this observation when she stated during an interview, “every small house has a small space” (Participant K, Wednesday 16 October 2013). Observation also revealed that the participants were very engaged in the learning process. There was a genuine desire to learn and absorb the information being taught in each session. Figures 12 and 13 show female participants taking notes and looking very engaged during the October 2013 training.

FIGURE 12: Female Training participant

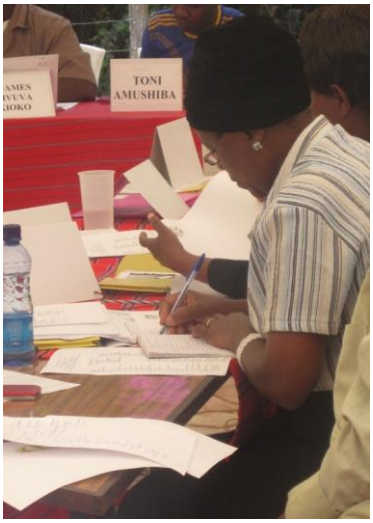


FIGURE 13: Female Training Participant

Participants were asking facilitators engaging and probing questions and constantly taking notes. Based on the level of interest and fascination toward the session content, it could be deduced that the majority of participants were learning this information for the first time and were very motivated. The trainers would provide hardcopy material which participants maintained and kept very organized in a binder or folder. Topics around livestock keeping, waste management and value addition were of particular interest to the group. It is important to note that participants were particularly attentive to discussions that addressed hygiene and water treatment. It was also noted that extension officer conducting such discussions spent a considerable amount more time answering questions and ensuring that participants understood techniques to avoid contamination. The concern around contamination revealed during interviews with government elite were expressed during the training sessions. It was clear that extension officers were emphasizing the importance of avoiding contamination and poor hygiene; and farmers were clearly invested in learning how to prevent such issues.

Based on session discussions, it became clear that a major barrier for farmers is accessing appropriate information on how to improve their technical farm practices and expand their farm

business. This re-emphasized the apparent disconnect between the farmers involved in the training and their local extension officer. The farmers clearly wanted and needed more information and expertise but were not receiving it prior to attending the training. It was also evident that participants were keen to receive more information about value chains and value addition, especially for the women. This was an interesting and important observation as it also showed participants the multiple ways beyond food security that urban agriculture could benefit them. It also reveals a woman's desire to improve and determine new ways of increasing household income generation.

Their results confirm secondary research highlighted in chapter two, which explained that women tend to face barriers when finding suitable wage employment and are therefore forced to find alternative ways of fulfilling household deficits, for instance urban farming (Lang & Barling 2012).

Many individuals understood the primary and traditional components of farming but did not understand or know about the opportunities around various entry points, how to capitalize on a portion of the value chain, or how to contribute to one point in value addition rather than the entire chain. A real willingness was observed on behalf of the extension officers who were facilitating sessions, to provide a strong knowledge base to participants during this training. It was obvious that there was a genuine desire to help and support participants achieve their agricultural goals. An important observation is that during the training sessions, extension officers showed a sincere desire to educate urban farmers and work with them. This runs counter to their concerns regarding urban agriculture expressed during interviews. Extension officers participating in this study hold conservative views of urban agriculture and do not always agree that the current risks out way the benefits; however, there was a willingness to proceed and

improve the farmer's knowledge in the training. In each session, participants would crowd around the extension officers with personal inquiries related to their farming businesses. Extension officers always offered their contact details and support post-training. In addition to extension officers, past graduates who were successful in their personal farming business also facilitated sessions. They provided their contact details for participants as well; however, they made it clear that they charge a consultation fee.

With regards to session facilitation, one difference between past participants and extension officers was the style of their sessions. Extension officers often used a more formal approach to teaching, whereas past participants were less formal and used props such as produce from their garden, small scale vermicomposting inputs, or examples of value addition such as jars of their own peanut butter. There was an obvious difference in style and content between the two groups. It often felt like extension officers were speaking from a more theoretical context and past participants from practical and personal farming experience. A male extension officer and training facilitator, supported this idea when he explained to the training participants during his session Farming Operations, "You [farmers] give me what you know practically and I give you what I know theoretically" (Session: Farm Operations, Tuesday 15 October, 2013, Mazingira Institute). Having the extension officers engaged as facilitators within the training is incredibly beneficial for ensuring the quality and calibre of the training and as mentioned above, it brings awareness to urban farmers around the support and services available to them. It is important to note that without inclusion of the extension officers and government buy-in, the Mazingira training may not have been as strong historically. The inclusive nature of the training has allowed for the partnership with government. This long-term partnership has provided

legitimacy to the training and Mazingiria, which has translated into urban agriculture dialogue and policy development in Nairobi.

One of the most impressive and powerful moments of the training was when a past graduate facilitated a session around his personal experiences of poverty. During his session, he explained that poverty was a mindset. He said to participants: "The choice is yours. We are here together to fight against the enemy we call poverty" (Session: Farm Capital, Tuesday 15 October, 2013, Mazingira Institute). He unpacked the reasons for this and why it was so important for individuals to empower themselves. He had a simple principle: "if you have a basket of assets available to you, such as knowledge, and you have the capability to exercise those assets, personal development and empowerment are all possible" (Session: Farm Capital, Tuesday 15 October, 2013, Mazingira Institute). He believed that people have a choice and explained to the group that this is the beginning of their new life and that it is their choice to take this knowledge and achieve their goals. He explained to them that the knowledge they are receiving in this training is a new asset and it is now their personal choice as to what they do with it. Figure 14 shows a past graduate leading the Farming Capital session in the October 2013 training. Figure 15 shows his accompanying flip chart notes.

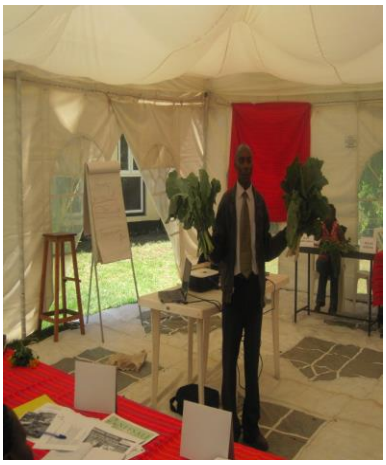


FIGURE 14: Past Graduate

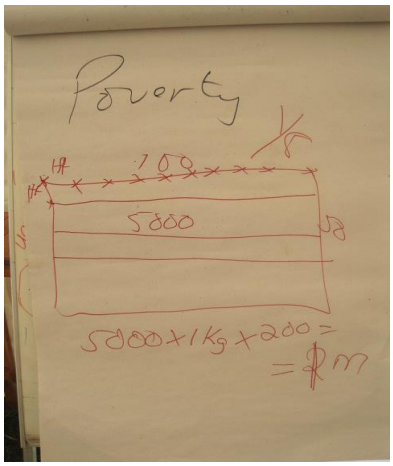


FIGURE 15: Session Notes

He continued on to explain that people are more vulnerable when they do not have the knowledge and assets but he emphasized that even when they are "poor" they still have the capability – but only if they choose to use it. He provided his contact information at the end of the session; however, he made it very clear that he would charge participants for his time if they wanted his advice or instruction. His requirement to be paid is supported and encouraged by Mazingira. It was obvious that having a past participant lead a session was inspiring and motivating for the current participants. This session was one of the most exciting and well received by the participants. Participants seemed able to relate directly to him and were inspired by the potential to transform their lives. Figure 16 shows participants crowding around the past participant and training facilitator, after his session on Farm Capital. He referred to his homemade incubator during the session and participants were very interested to learn more. Figure 17 shows the homemade incubator used for quail eggs.

FIGURE 16: Participants Gathered Around Facilitator

FIGURE 17: Homemade Incubator

During the training, there were other past participants who led sessions and a similar level of enthusiasm and connection was established with the participants. Having past graduates leading sessions seemed to add value and motivation for participants. It was obvious that the participants were able to relate to the past graduates, their struggles and ultimately their successes.

During the afternoon of October 15, four past graduates from Mazingira's Youth Hub, ranging in age from 18–35 (three males and one female), led a session aimed at helping current participants understand the value of their newly gained knowledge. (See appendix 11 for the list of questions asked to the Youth Hub members.) They explained that if applied and used, the potential advantage for each participant's farm business can be significant and profitable. The

female participant in this discussion confidently stated: “Before I was farming for consumption but after the training I realized I could treat this like a business and make a good income from it” (Participant F, Tuesday 15 October 2013). She went on to state, “I am a farmer by profession. I grow strawberries and I am proud of that” (Participant F, Tuesday 15 October 2013). Another male participant explained that Kenyan youth “don’t have to search for white-collared jobs because [they] realized [they] can make a better profession out of farming” (Youth Hub Member and Past Participant, Tuesday 15 October 2013). He went on to explain that farming is not what many people recognize it as – a simple livelihood for the poor. According to him, it is a major income generator and if looked at in a professional manner, farming can offer someone a very successful and sustainable career. He confidently stated, “Here in Nairobi, if you make farming your goal, you will do well” (Youth Hub Member and Past Participant, Tuesday 15 October 2013). He believes this was his major learning from the training and this new perception has changed his life. Their session was more of a presentation format and motivational in nature compared to other sessions that provided technical skill development and knowledge. During an interview with this group of graduates, it was detected that they wanted to be more involved in the actual training. It was obvious from this discussion that they saw value in their involvement, particularly through formal and informal mentorship as well as offering expertise to current participants.

Observing the informant groups during the general training revealed that participants were generally very pleased with the training and felt that their expectations were met. There are areas of the training that were identified for improvement, such as increasing opportunities for practical hands-on experience. The overall level of attentiveness and commitment of the participants during the training demonstrated that accessing appropriate information is a

challenge for farmers. Observing participants also showed that a majority of them had useable farming assets but did not recognize that when entering the training. Extension officers showed a genuine desire to teach and improve the skills of the participants, while providing them with a strong technical knowledge. Lastly, engaging past participants as facilitators is a strong feature of the training, providing relatability and inspiration for training participants.

4. 4. Observations and Findings from Onsite Farm Visits with Past Graduates

In addition to attending and observing the training sessions, onsite farm visits with past participants were conducted. Onsite visits provided the opportunity to observe urban farming in practice while at the same time building dialogue with the farmers in a less structured framework.

4.4.1 Impact on Past Graduate's Financial Well-being

Many things were observed during the site visits, such as when implemented and operated as a business, urban farming can achieve increased profits for the farmer. Personal finances were never discussed with the past participants; however, it was apparent that each farmer was offsetting their family's food costs and also providing one, if not more, sustainable income streams that they did not have prior to the training. According to one urban farmer, he has been able to support all three of his children to attend university and pays two full time staff (Past Participant D, Saturday 12 October 2013). The farmer's daughter is studying nutrition at a local university which is directly connected to food production and will extend this family's network and knowledge.

4.4.2 Impact on Past Graduates Social Sell-being

During one interview, a few small children were observed playing in and around the farm – these children will now grow up with a healthy food source, exposure and understanding

of their food, the feel of community and access to the skills and tools to earn an income. It was obvious that individuals living in the area were interested and engaged in this farming initiative, which provides a skill set for making money. This is important, as many who worked with under-privileged communities in Nairobi explained that the catalyst to crime is a need for money and often those individuals do not have the skills to help them generate an income legally. It would be relevant and interesting to explore whether youth involved in farming are less likely to participate in crime. Figure 18 shows a public housing community where children play among the urban agriculture plots.

FIGURE 18: Neighbouring Children Playing in Urban Farm

While conducting interviews with past participants, it was very common to see neighbours replicating smaller urban farming projects on their own property. It was explained that the past participants often motivated and assisted neighbours in the initial start-up of their urban farm and offered advice throughout the growing period. Many times, when a group of urban farmers were together, the group could be observed trading seeds, produce, cuttings and knowledge with one another. Individuals also shared stories regarding their connections with government officials, community activists, other successful farmers, super market suppliers as well as media houses.

During the course of the field research, one particular farmer and graduate of Mazingira, also known as the “Rabbit King”, was referenced numerous times by government elite, influential community members, industry activists and other farmers, as being a leader in urban

farming. I later learned that this farmer identifies himself as a trainer and mentor to others. He conducts professional trainings and site visits to fellow farmers, community members, and international students studying urban agriculture. He charges a small fee for this service. I had the privilege of visiting this man's farm, located in a public housing area; here his young son was observed explaining rabbit keeping to a group of visiting guests and the role and market around rabbit meat. He was explaining that at first, community members were hesitant to consume rabbit meat because it was not a traditional food source; however, his father built a market for himself and started offering neighbours free white meat. People now enjoy eating rabbit meat and it has become more socially acceptable for household consumption. It was very apparent that the father's urban farming practices and knowledge were transferring to his son. This young boy was very vibrant and confident in his explanations and explained that his goal was to continue to build his father's business.

During another interview, a female farmer and Mazingira graduate portrayed a sensibility and optimism that has clearly come from her work with the Women's Hub and her own trials, tribulations and successes. She radiated a feeling of empowerment and spoke openly about her community connections (Past Participant B, Saturday 12 October 2013). The farmer also spoke openly about the impact this training has had on her when she stated that it "has literally changed her life" (Past Participant B, Saturday 12 October 2013). She explained that the training offered her an understanding of the different systems and approaches required to practice urban agriculture. She now teaches to others interested in farming. She feels a sense of responsibility to her community rather than a desire to improve her income. According to her, since graduating she believes that she has trained more than a 1,000 people. She was a facilitator during the 2013 training and her session on value addition was very well received. It was clear that she felt the

responsibility as a training graduate to train others and to mobilize and mentor others in urban farming. In addition to her own financial goals, training and mentoring others was her dedicated passion. This woman attended Nairobi's World Food Day on behalf of the Women's Hub and accepted the Ministry of Agriculture, Livestock and Fisheries award for Best Preforming group. During this particular day, I observed her networking with and informally lobbying government elite and industry professionals who were present.

Not all past graduates interviewed were as connected or influential as the two farmers noted above; however, many were and the individuals who were not, were still influencing and connecting with a large number of community and industry members. It was evident that the training has catalyzed a larger social network focused on urban farming for these individuals.

4.4.3. Impact on Past Graduate's Personal Health and Well-being

Changes in the personal health and well-being of past participants were difficult to measure. The one obvious gain that the past participants all demonstrated was a constant supply of organic food. I could see that each person had a sustainable source of healthy food that their family and community members had access to. During the interviews, all 4 past participants explained that they experience less stress now as they are no longer worry about how to feed their families. According to the Food and Agriculture Organization, households spend up to 80 per cent of their income on adequate food sources (Food and Agriculture Organization 2010). Growing and supplying their household with a healthy food source allows the farmers to offset this annual expense and reallocate the money to other areas of importance. One farmer suggested that there was no reason for his family to eat processed food and go without a proper nutritional diet (Past Participant D, Saturday 12 October 2013).

One other anecdote shared by an extension officer referred to a training graduate who struggled for many years with a drug addiction (Male Extension Officer, Session: Farm Operations, Tuesday 15 October, 2013, Mazingira Institute). After this man completed the training he started to focus heavily on his urban farm as a business and is no longer using drugs. According to the extension officer sharing this story, many believe his success in battling his addiction was directly linked to the benefits of farming, his own self-empowerment, as well as his new ability to generate an income for his family.

4.4.4 Impact on Past Graduate's Technical Farm Practices

During interviews, all four past graduates spoke confidently about the technical improvements of their farming practices since the training. During farm visits, I observed impressive technical innovation and construction such as homemade drip irrigation systems, vertical gardens and sack farming. Figure 19 shows a drip irrigation system used for strawberries that was built by a female urban farmer and past training graduate.

FIGURE 19: Drip Irrigation System

The farmers understood precisely their approach and felt confident that they were executing proper farm practices. If there were flaws in their systems or techniques, they would identify them during discussion and explain that they continue to work on improving the issue.

One farmer had a meticulous understanding of his rabbit breeding and harvesting cycle that allowed him to capitalize and maximize his profits. All of the farmers interviewed had developed a closed cycle that minimized their external input costs and took advantage of the organic and biological waste produced on their farm. A closed cycle decreases the dependency on external inputs and uses the farm waste instead. For example, the rabbits feed from the plant waste produced from the harvest and their manure is then used as natural fertilizer for the garden. Figure 20 shows a pile of organic and biological waste used as farm inputs and sold to other farmers for the same use. One farmer interviewed explained that he was a farmer before the training and now post-training he was a more sophisticated farmer and businessman (Past Participant D, Saturday 12 October 2013).

FIGURE 20: Compost Pile

Water was still a major issue for these farmers; however, through the training they learned and now practiced ways to combat the issue and avoid using contaminated water. Figure 18 shows strawberry seedlings grown in tradition sacks (i.e. sack farming) in Utawala, Nairobi, Kenya. Urban famers use this technique to help with water scarcity and/or lack of agricultural land. Figure 21 shows a mixed crop located in Maringo which is a public housing neighbourhood in Nairobi. Kenya. This farmer uses organic fertilizer and drip irrigation to support this production.

FIGURE 21: Strawberry Sack Farming

During a farm visit, urban farmer and staff member B explained that he used organic cleaner to spray his livestock pens. He explained that this was quite common among professional urban farmers, especially those who have been trained by Mazingira. This showed that farmers are conscious of the chemical inputs they introduce into their environment. He also explained that they use organic cleaner because the rabbits sprawl on the ground (Non-Government Elite and Staff Member B, Saturday 12 October 2013). There was an obvious compassion and care on behalf of this farmer for his animals and the environment and a desire to ensure a healthy and safe practice.

The findings presented in this chapter demonstrate that the training has positively impacted past participants. Each past participant interviewed revealed that the training had a multiplying affect. The training helped participants develop a new ability to provide healthy food to one's household; to encourage the pursuit and development of new income generating opportunities; and, to engage in community and social networking opportunities tied to food security and production. Interviews with past training participants demonstrate the training has

had a strong positive impact on their lives in the four specified areas: social, health, financial well-being and technical farm practices.

4.5 Short-term Post-training Impact: Findings from May 2014 Follow-Up

Having discussed the impact of the training on participants that were involved several years ago, it was also important to follow-up with participants that had recently completed the training. This was in order to understand the short-term impact of the training. Hence, follow-up research interviews were attempted via telephone in May 2014.

One main challenge for Mazingira is the cost and challenge of following up with participants. The challenge of follow-up limits knowledge of how participants fared a short time after the training. Therefore, the purpose of the follow-up was to understand whether and how their lives as urban farmers had changed since the training, with specific attention given to their social, financial and health related wellbeing in addition to their technical farm practices. During my attendance at the October 2013 training, each participant was informed that I would be contacting them after the training. All 16 female participants interviewed were called; however, only six could be interviewed. Challenges that were encountered included disconnected numbers, challenging or unclear phone connections, language barriers, as well as an unwillingness to talk by phone. The women were asked questions that focused on their situation post-training, for instance asking whether they were still farming; had their farming practices changed since the training; did the training help them overcome any obstacles they were facing before attending the training; had they been able to grow their farming business since completing the training; and were they more engaged within the agriculture community than prior to the training. (Refer to appendix 9 for the complete list of questions asked to the female training participants over the

phone in May 2014.) These results provide important context about how the training had impacted individual women in the short-term.

4.5.1 Impact on the Women's Financial Well-being

All six of the women interviewed were still farming and had improved their business model post-training. They all claimed to have increased their income through value addition, increased distribution and sales, or increased production contributing to the lowering of their household food bills. All of the women reported that they felt more financially stable since the training. They each provided concrete examples of this stability. For instance, Participant F explained that she is now paying for her son and daughter's university education, which she was unable to do prior to the training. Before the training, this particular woman sold her goods in her home city of Mombasa but now has enough products to expand her distribution channels to surrounding areas.

Participant K explained that prior to the training she could not afford to transport her milk and yogurt into the city centre where sales are more profitable; however, with a more cost-effective farming business she is finally able to afford this transport cost, and thus reap greater profits. This particular woman has a professional background in design and handcrafts; with this experience and knowledge she has added value to the traditional plastic and paper sacks used for vertical gardens and redesigned them using a tent-like material. The bags store water much more effectively than any original materials used. She has invented a relevant product for local urban farmers and is now working on securing a small loan to assist her in purchasing material in bulk. Representatives from a larger scale Kenyan farming business have started approaching her to inquire about her bag production. In addition to developing her bag business she is also farming cattle. She learned in the training how to find alternatives to expensive cattle feed. She now goes

to the market regularly and buys the venders leftover banana peels, dries them at home and grinds the peels up for cattle feed. This saves her money and ensures that her cattle are properly fed. Since the training, she feels more confident farming cattle and as a result of her improved techniques and care, her cattle's milk production has improved.

Participant O explained that improved finances have allowed her to pay for her father's recent hospital bills. According to her, this is something she would not have been able to do prior to the training. Participant K explained that the training gave her the knowledge necessary to apply for and received formal certification for her farming products which has allowed her to sell to formal supermarkets. Lastly, one woman explained that during her participation in the training she learned from her peers about the National Cooperative Housing Union (NACHU). Since the training, she has applied to be part of this housing cooperative as a result of her new found financial security.

4.5.2 Impact on the Women's Social Well-being

Participant G has established a new relationship with the Ministry of Agriculture. The Ministry is helping her secure a greenhouse for the organization for which she works. She is also working closely with the extension officers in her local area and finds this consultancy service incredibly beneficial. It is important to note that this is the opposite experience had by past participant D, who suggested they received little support from extension officers. Another training participant has joined a national body that focuses on global quail markets. She works closely with this group to help expand the distribution market for quails. A third woman, who entered the training with the intention of gaining knowledge to train at risk youth, has achieved her goals and post-training has taught and mentored a large number of youth. Participant F has partnered the organization she is chairing with a local organization, to assist in expanding her

business. She is now working with a local school feeding upwards of 30 people per day. According to her, this number of food recipients continues to expand. Each of the women also reported having maintained at least one personal connection with a fellow training peer. One woman has received regular visits from a Mazingira staff member, who is often accompanied by an extension officer. She has redesigned a seedling container and a Mazingira staff member is helping her promote the product and build her current and potential customer base.

4.5.3 Impact on the Women's Personal Health and Well-being

Only one of the women interviewed suggested that there was a direct impact on her physical and emotional health. During the phone interview, Participant F explained that prior to the training she would develop anxiety when going to the market to shop for her family because she had to purchase enough food that would adequately feed her family on very little financial means. She no longer feels that burden considering she now produces majority of the food her family requires in her own garden. According to her, reducing this stress and anxiety has significantly improved her mental health. This woman is also HIV-positive and explained that having access to a sustainable and secure source of nutritional foods has significantly improved her overall physical health. Another woman explained that the improved nutrition levels resulting from an increased access to food supplies make her feel stronger and healthier. The other four women were asked if they felt their personal health and well-being had improved since the training. They responded that their health remained the same and they did not see an obvious improvement.

4.5.4 Impact on the Women's Technical Farm Practices

All six women interviewed explained that their farming practices have greatly improved since the training resulting in increased production. Participant K explained that due to increased

yields she can now give away excess food to her family and surrounding neighbours which combats the food security issue for those individuals. She explained that this new ability to help others has brought her so much personal joy and satisfaction. Furthermore, she is also working with the Institute of Organic Farmers of Kenya on insect control. They are teaching her how to use natural pesticides and plants to deal with pest challenges. She also explained that her son recently graduated university but is unable to get a job. Knowing her own recent success, she encouraged him to attend an aqua-farming training with the Ministry of Agriculture. He has recently built a fish pond on her property and is just waiting to receive the fingerlings (small juvenile fish) from the Ministry. She is really excited to see him launch this project and feels confident it will be profitable for him. She plans on advising him where possible. In addition to her own farming business, she trains and consults her neighbours regularly at no charge. Many of her neighbours have started implementing their own urban farms. Professionally, she works with an organization that addresses child poverty. She and four other participants from Mazingira's October 2013 training are teaching urban farming production to the staff and children at local orphanages in Nairobi. She explained that the children are really excited to learn these new skills and have become very involved in the growing process. She encourages the staff at each orphanage to use the services offered by extension officers and proudly reported that one particular orphanage is now fully self-sustaining.

Water still remains a major problem for the women; however, one woman did confirm that she now filters her domestic wastewater since learning this practical method at the training.

The results of this study suggest that the training has had a positive impact on the female participants in the short-term. Nonetheless, the results remain anecdotal. Clearly for the findings to be more convincing, a more representative and random sample of interviews are needed. The

interviews do reveal that there is evidence to suggest the training has short and long-term benefits to women on their social well-being, financial well-being, health, as well as on a their technical farm practices. For instance, the women who were operating their farm business with more sophisticated approaches post-training were improving profits and increasing the number of income generating streams for their household. A majority of female farmers are more engaged in their community via training and mentorship and have become involved in the women's hub or have built relationships with their local extension officer. The study also reveals that all female farmers interviewed post-training now have a steady supply of food for their personal needs, their family's needs and often enough supply to share with neighbours. Lastly, a majority of the female farmers significantly improved their technical farm practices; minimizing their inputs, finding solutions to water scarcity and achieving good health and hygiene of their livestock.

What remains inconsistent is the relationship between the farmers and the extension officers. In some cases, there is some disconnect between what extension officers expect of the farmers and alternatively what farmers expect of extension officers. Findings also revealed that even with the perceived benefits of urban agriculture, extension officers did not always agree that the benefits outweighed the risks involved, particularly in terms of contamination and hygiene.

CHAPTER FIVE: RECOMMENDATIONS AND CONCLUSIONS

The rapid growth of cities makes urbanization one of this century's most challenging global social trends. Food systems are struggling to keep up with the demands of urban growth, leaving fresh food harder and more expensive to acquire. One long-term strategy used by households to improve access to nutritional food is to practice urban agriculture, which provides an income stream and a food source in times of crisis. Even though urban agriculture achieves significant benefits for many households globally, there is still a strong argument that the benefits do not outweigh the risks involved. One prominent risk is around biological contamination and proper hygiene during handling. However, even with these risks, there are many cities around the world that practice urban agriculture, in wealthy and poorer regions. Furthermore, there have been numerous global success stories that showcase alternative and sustainable urban agriculture practices.

Given rapid urban growth in sub-Sahara Africa in particular, and the value of urban farming, one important question raised by this study is what the impact might be on African cities if urban farmers were better supported through capacity building and training. This question is particularly important for women who hold a responsibility as their household's primary caregiver. The pressure to provide their family with a proper food supply tends to force them into urban farming while also providing a positive means of improving their overall well-being along multiple dimensions.

The original aim of this study was to evaluate the impact of urban agriculture training and capacity building on female urban farmers who participated in an agriculture-based training. Specifically, it examined the impact of training along four dimensions: social well-being, financial well-being, health quality benefits, and changes or improvements to a participant's

technical farm practices, such as environmental management techniques. Evaluations, based on interviews, participant observation, and site visits with past participants suggests that the training is having a positive and beneficial impact in the short and longer term on participants in the four dimensions of primary interest. At the same time, certain features or components of the training are impacting participants differently. However, defining a definitive list of factors which guarantee impact for all participants is not possible. This chapter will identify areas of the training that are contributing to a participant's success. This study only evaluated the training model of the Mazingira Institute. Hence, the recommendations presented in this chapter are informed by my experience with Mazingira as the lead organization in Nairobi conducting relevant training for well over 5 years. However, the recommendations are not directed at Mazingira but for any individual or organization considering a training model to support urban agriculture.

This chapter offers recommendations on how training and follow-up may be enhanced or altered to support a greater impact on a participant. The recommendations offered in this chapter are split into two sections. One section presents short-term recommendations where resources and capacity are limited. The other section, presents recommendations that would require a substantial injection of human and financial resources. In contrast to the first section of this chapter, the recommendations that require major resources should be viewed as longer-term goals. This chapter will conclude by reinforcing the importance of urban agriculture in terms of combating global food insecurities. Finally, it reflects on what other developing cities may learn from the research and findings presented.

5.1 Recommendations that Require Limited Resources

Urban farmers interested in attending the Mazingira training apply for the opportunity through an application process. A diverse group of farmers differing in age, gender, socio-economic status and overall farming practice is selected to attend the one-week training.

5.1.1 Recommendation 1: Setting short-term and long-term goals

Upon completion of the training, participants are required to develop a business plan with clear aims and goals. This is an excellent component of the training model that encourages participants to establish goals and I would suggest it is maintained. For future trainings, it is recommended that participants submit their short-term and long-term goals with their training registration and application forms. Those goals should be provided to the training facilitators in advance with an aim that they tailor their session material to meet the specific goals of their audience. The study revealed that even though the group of urban farmers was diverse in profile, their short-term and long-term goals had many commonalities. Secondly, if participants have identified clear goals and expectations in advance of the training, it allows them an opportunity to begin formulating and developing their business plan from the initial stages of their enrollment. It also provides the participant the ability to apply their learnings from each session directly to their business plan in that teachable moment. An important observation shared during an interview with one Mazingira staff was that participants, who enter the training with a formal business goal, tend to be more successful in achieving their business plan post-training, than those who begin the training with no business goals in mind (Non-Government Elite and Staff Member B, Saturday 12 October 2013). During the training, I observed that participants, who had initial business goals when entering, were more likely to present a stronger business plan on the final day than those who did not. Entering the training with business goals encourages

participants to think through the expectation and purpose of their attendance in addition to adding context, securing a personal commitment and desire to achieve those goals.

5.1.2 Recommendation 2: Extension officers and follow-up

One challenge often discussed with all key informant groups during interviews was the inconsistent relationship between extension officers and farmers outside of the training environment. The training is helping to build a relationship and awareness between the farmers and government elite by having the extension officers participate in the week long training. It also affords an opportunity to inform urban farmers of this free service offered by extension officers. One long-term aim of the training is that farmers will learn about the services extension officers offer and connect with their local extension officer post-training to share their needs and farming activities. Farmers will gain a service intended to support and assist safe farming practices in Nairobi. I would suggest future training purposefully engage government elite and continue to promote the support extension officers provide to farmers. However, there is still a need to encourage and ensure the connection and relationship between the two parties is established post-training. Therefore, I recommend inviting extension officers responsible for each participant's local area to attend the final business plan presentations. In the case of the October 2013 training, this would have required inviting upwards of 38 extension officers to the final presentations. It would be beneficial for the relationship between the extension officer and participant, for presentations to be followed by a one hour networking opportunity. The aim is to build a connection between the two parties, exchange contact information, and confirm next steps. A hard copy of each participant's detailed business plan should be provided to their extension officer during this meeting. Building a follow-up process for participants via extension officers would minimize the demand on the hosting organization or individual providing the

training. It also provides the Ministry of Agriculture, Livestock and Fisheries opportunities to better engage with and review urban farming within Nairobi. A more time and resource-intensive recommendation would be to encourage a formal mentorship programme between participants and extension officers, resourced by the Ministry to ensure accountability and buy-in on their behalf. In addition, the training provider might request that extension officers provide a simple progress report for each training participant to help monitor the impact and improvements of each participant. This information would contribute to the evolution of the training and general work with urban farmers in Nairobi. However, a formal evaluation of the participant's farming business via their extension officer may pose as a discouragement and cause the farmer to disengage. It is important to note, that during my interview with members of the youth hub, the need for follow-up was an important topic mentioned several times (5 Past Participants, Tuesday 15 October 2013). They felt that participants would benefit tremendously from post-training follow-up. They suggested that the extension officers' conduct follow-up visits to understand better their local area farmers, gain insight into challenges and obstacles the farmers are facing, and to provide them with solutions and expert knowledge to ensure that urban farming in Nairobi is safe and productive. During the completion of this research paper, it was confirmed that Mazingira has recently started conducting follow-up with the 2012 and 2013 training graduates.

During the training, participants received hardcopy handouts that accompanied each session. I observed the value and importance participants placed on this information. Due to limited resources, Mazingira must be very cautious when printing materials for participants. Considering this, it is recommended that in future training, extension officers provide their own printed materials. This would help with overhead costs but also to encourage and allow for extended support material to be added to each participant's training pack. With such value and

importance placed on this material by participants, there is a high likelihood that this training pack will be referenced and used for future guidance by urban farmers and their networks.

5.1.3 Recommendation 3: Increased opportunity for hands on training

The participants of the October 2013 training expressed their desire in practical hands on training and a desire for opportunities to attend farm-site visits. The research findings show that this would contribute to the training's impact and therefore it is recommended that a one-day practical farm visit be considered for future trainings. The opportunity to visit multiple farms would be appreciated by training participants. For instance, offering three farm-visit options such as quail, vertical farming and rabbit keeping, allowing participants to select one farm that best meets their needs and long-term business goals. A site visit would provide participants an opportunity to consult with successful farmers who have experienced similar challenges and found ways to work through those difficulties. This would allow participants to see a strong agricultural business model and really understand the potential urban agriculture has if implemented carefully, with planning, and with support. To offset the expenses needed to implement this day, it is suggested that participants pay for their own transport to their selected farm. In the case of Mazingira, transport costs are already provided to participants for the entire one-week training; therefore, requesting farmers to personally incur this additional transport cost would be unrealistic. What is important to note is that hands-on practical training is strongly desired by participants and would contribute to the overall impact of the training. It is highly recommended that if and when incorporating a site visit into the program becomes financially viable for the training hosts or participants, that it be strongly considered.

Mazingira's business model encourages graduates to charge consultant fees to persons interested in seeking advice or training directly from them. I strongly support this; however, I

would suggest asking past training graduates to donate their time two days per year (once per training) to host a group of interested training participants. The graduate farmers hosting the site visits would not charge for his/her services but will gain exposure to an increased number of future consultancy opportunities.

5.1.4 Recommendation 4: Engaging past graduates as session facilitators

During the sessions facilitated by past graduates, it was evident that current training participants were comfortable relating to these presenters. Participants were extremely engaged in these sessions; often asking questions associated with the farmer's own personal challenges and experiences. In contrast, the questions asked to extension officers often related to the technical element of farming. This reveals that extension officers and past graduates are offering different content and expertise. The contributions of both parties are equally important but fulfilling different needs of the training participants. Considering future trainings, I would recommend that the added value and contribution of extension officers and past graduates be considered when selecting facilitators for each session.

5.1.5 Recommendation 5: Strengthening the use of the Hubs

The youth and women's hub was referenced in several informal conversations and semi-structured interviews, during my time in Nairobi. Various members of each hub were asked to identify the number of people actively participating and attending meetings regularly and the numbers often varied. Therefore, it was difficult for me to gain a broader sense of each hub's reach or impact. Past graduates who were active in the hub did explain the value of participating in these networks as opportunities to engage with people in similar circumstances, the network provided guidance, and it was a place to connect and share ideas with others after the training. For instance, a young female youth hub member explained to me on October 12, 2013, while

showing us around her strawberry sack farm, that mentorship was a component of their hub and that the ability to mentor and be mentored has helped her tremendously, both personally and professionally. She continued on to explain that she felt it was it was the past graduates moral responsibility to train the more recent graduates. It was observed that the youth and women's hubs seemed to be one of the more important activities to support and follow-up after training. Each hub creates an informal space where urban farmers who have graduated from the training come to seek support but just as importantly could also offer their individual expertise related or not related to urban farming. During the October training, participants ranged in their levels of farming knowledge; however, each person had a unique skill set and competency (professional and non-professional) outside of farming. For instance, one male participant was a financial adviser in his professional life; another young woman had recently graduated from a marketing and communications program; a third woman had professional fashion and design experience; while another participant owned her own wedding catering business. This is only a small fraction of the non-farming skill sets and competencies among the October 2013 training participants. If all participants were to actively engage and commit to the youth hub, women's hub or NEFSALF network post training, more diverse skill sets within each network would be shared. This diversity is important to help overcome the (non-farming) challenges that affect farming business goals. For example, in chapter four, I discussed how one female participant altered the design and material of a traditional sack used for vertical farming. This newly improved sack has generated interest among small scale urban farmers and larger farming businesses. At the moment, she is selling and promoting this on a very small scale via word of mouth. She confirmed that she is now seeking a small loan to help her purchase material in bulk and ultimately expand her production. If this woman was an active member of the women's hub

she would have access to a greater diversity of professional and non-professional skills that could help her achieve her goals faster and with a larger impact or profit. She would also have access to a micro-credit scheme which would allow her the opportunity to purchase more material. Greater engagement with a formal network would provide benefits for her business and opportunity to share her knowledge. Naturally, one could argue that farmers do not want to share their idea with others for fear of infringement. However, based on observations during my time in Nairobi, farmers sharing ideas, exchanging knowledge and supporting one another's goals was constantly occurring among the urban farmers I met.

One challenge with the hubs was that they were casually and informally promoted to the training participants and concise messaging as to why and how a person should get involved post-training was missing. By the end of the training, participants became aware that both hubs existed, primarily due to the hard work and dedication of one Mazingira staff member in particular, who promoted them. However, it is not certain that participants would have engaged or understood the benefit of joining the hubs without the promotion done by a Mazingira staff member. I recommend that for future training, time should be set aside for a formal session with the goal of promoting the benefits of the hubs and, and clarifying how to get involved with them. This may ignite excitement and interest within training participants and help secure their involvement post-training, resulting in membership increase for each hub and the introduction of new skill sets. Furthermore, it is important to continue to examine the hubs, try to support them, and consider ways that they may develop their impact and purpose over time. Similarly, opportunities for farmer's participation in formal (and in formal) networks, such as NEFSALF, should also be actively promoted within the training. Clarity and discussion about the value and

opportunities for farmers to get involved in external and internal forums is beneficial and would result in greater participation of farmers post-training.

The qualitative evidence collected reveals that the training offered by Mazingira is having a positive impact on participants in the areas of social, health and financial well-being as well as their technical farm practices. However, identifying particular reasons as to why specific participants were more impacted than others was not possible. The chapter highlights current best practices, in addition to recommendations for future trainings. Expecting participants to submit their business goals upon registration; inviting extension officers to the final business plan presentations; requesting facilitators to supply their own handouts; adding practical hands-on farm training into the program; finding a diverse but purposeful balance in facilitators; and, exploring ways to strength the use of the hubs are all recommendations that would increase the impact of training on participants with minimal resources required.

5.2 Recommendations that Require Significantly Increased Resources

Many non-governmental organizations are faced with limited human and financial resources. I was very mindful of this challenge when writing the above section 5.1; however, I will now provide a section that is less attentive to those needs and suggest recommendations that would require significantly increased resources. These are long-term and should not be considered until all the recommendations from section 5.1 have been reviewed. It is important that this information be provided as well so as not to limit the study and provide insight for when future resource opportunities become available. The primary recommendation is to offer supplementary training that builds on the foundations of an initial training session(s).

5.2.1 Recommendation 1: Supplementary Training

An area for future consideration is to offer supplementary training that builds on the foundations of an initial training session. According to the participants, the training met all expectations; however, as they began implementing their business plans and applying their new knowledge post-training, complex challenges arose and they admitted that supplementary training would be beneficial. Therefore, I recommend that an extended multi-tiered training approach be considered. It was frequently suggested by both past graduates and recent participants that the introduction of topic specific, advanced level, and business and information technology trainings would assist them in the further development of their farm practices.

Topic specific training would teach participants one primary commodity, for example rabbit keeping. The training would address all facets of producing, harvesting and distributing this commodity, with particular emphasis on contamination and hygiene. If applicable, it would include a value addition component, such as rabbit fur, to help the participants develop a competitive advantage to their business model. Participants would gain more detailed and comprehensive knowledge on one topic compared to an introductory training in many topics. This training would be aimed at individuals who have basic knowledge, interest and experience with a commodity but most importantly have clear business goals in mind.

The introduction of advanced level training would offer participants who have graduated from the topic specific (basic level) training and now require more expert high-level content. I would encourage a restricted enrollment and only offer these enhanced training opportunities to graduates of the initial foundational training. I would also suggest charging a registration fee for the advanced training, considering the participants who enroll are expected to be urban farmers who applied their knowledge from the topic specific training and are now experiencing a more

profitable business. The content would build on the foundations of previous training offered and allow participants to expand and develop their knowledge based on their farming business goals. This would improve the farmers knowledge, developing industry experts to help lead on the efforts of professional urban farming.

Lastly, business and information technology training would focus specifically on building entrepreneurial and commerce skills in addition to the marketing and promotions of farming. This would assist farmers in the professional marketing, labeling, selling and distribution of their products, which would result in more profits. The training would incorporate hands-on computer literacy and internet navigation sessions, especially for older generation farmers. I understand that purchasing and setting up an accessible computer lab is quite unrealistic; therefore, I would encourage partnership with local colleges and universities, asking for the short-term use of their facilities in exchange for donor recognition. Similar to the advanced level training, I would limit the enrollment to only those who have graduated from the topic specific (basic level) training and charge participants a registration fee. For this particular training, I would lessen the involvement of past graduates and extension officers to lead and develop sessions. Instead, seek out business and technology professionals within Nairobi. I recognize the large investment this particular recommendation requires; therefore, cooperative training should also be considered. This is where people pool their products and resources to achieve a common goal.

If all recommendations regarding supplementary training were implemented and success was achieved, meaning a high participation rate was constant there is risk that the training falls victim to its own success. The more prized and valued a training becomes the more demand rises. With increased demand comes the increased need for resources. In terms of these recommendations, I have presented them with the assumption that a non-governmental

organization would be the primary reader of this information. Therefore, prior to proceeding with these recommendations it is important to consider an organization's capacity. It is also recommended considering the value of partnerships with universities, governments and stakeholders interested in food security and urban agriculture, to help with the expansion of training.

5.2.2 Recommendation 2: Developing a train the trainer model

Within Nairobi there are many organizations working with disadvantaged or underrepresented demographics to support and improve their current circumstances. During the October 2013 training, there were participants who were working or volunteering with such organizations, which shows an interest is already present. Therefore, I recommended developing a train the trainer's model for people (or organizations) already working or volunteering with disadvantaged individuals. Interested organizations often already have established relationships with a targeted community who experience food insecurity and therefore have developed a model that will support proper implementation post-training. This will result in a wider network of persons ultimately receiving and benefiting from the training. It is recommended that the training offered to this professional audience extend outside of the urban farming context and provide a formal space in the program for participants to share best practices among themselves. Offering training opportunities for organizations to collectively learn and network could be a unique feature and one of great value for professionals. This recommendation does not directly improve the impact on a training participant in the areas identified. However, it does build a larger network of professionals that become more familiar and accepting of urban farming.

To summarize, this research suggests that in addition to short-term changes to the training, there are also potentially long-term benefits from promoting more comprehensive and

supplementary training opportunities that build on initial training. These long-term, more resource intensive suggestions, have the potential to add to the training benefits already experienced by farmers. Topic specific, advanced level and business and technology trainings are areas where enhanced training would be the most impactful. Developing and offering a train-the-trainer model would result in a larger network of professionals receiving and benefiting from the learning of Mazingira, joining and supporting Nairobi's fight against food insecurity.

5.3 Conclusion

Urbanization in poor regions of the world is rapid. The rise in urban residents has caused poverty to increase in many cities, particularly in sub-Saharan Africa. Food insecurity is a direct result of poverty and many low-income families find it more difficult to afford and therefore access a steady supply of nutritional food. In many cities, women hold the responsibility of providing the household with food and this becomes more difficult to do with low or lowering income. However, women adapt in the most extraordinary ways to ensure their families and households survive the challenges facing them. As a result, urban agriculture has become one main survival strategy to overcome food insecurities in many developing cities. There are proven benefits to urban agriculture; however, it also presents very serious challenges surrounding biological contamination and hygiene. If training and capacity building opportunities were offered to urban farmers with the aim of minimizing such risks, urban agriculture has the potential to continue to minimize food insecurities and provide other tangible and intangible benefits.

The aim of this study was to demonstrate the impact that training and capacity building in urban agriculture production has on female farmers. Specifically, the study examined how and whether training changed or improved a woman's social well-being and social networks; the

financial well-being or security of female participants; her personal and household health; and changes or improvements in a woman's farming practices. The study did not evaluate the pedagogical aspects or limitations of training and capacity building. Further research on this, in relation to female urban farmers in developing cities, would strengthen and be of great benefit to this field of research.

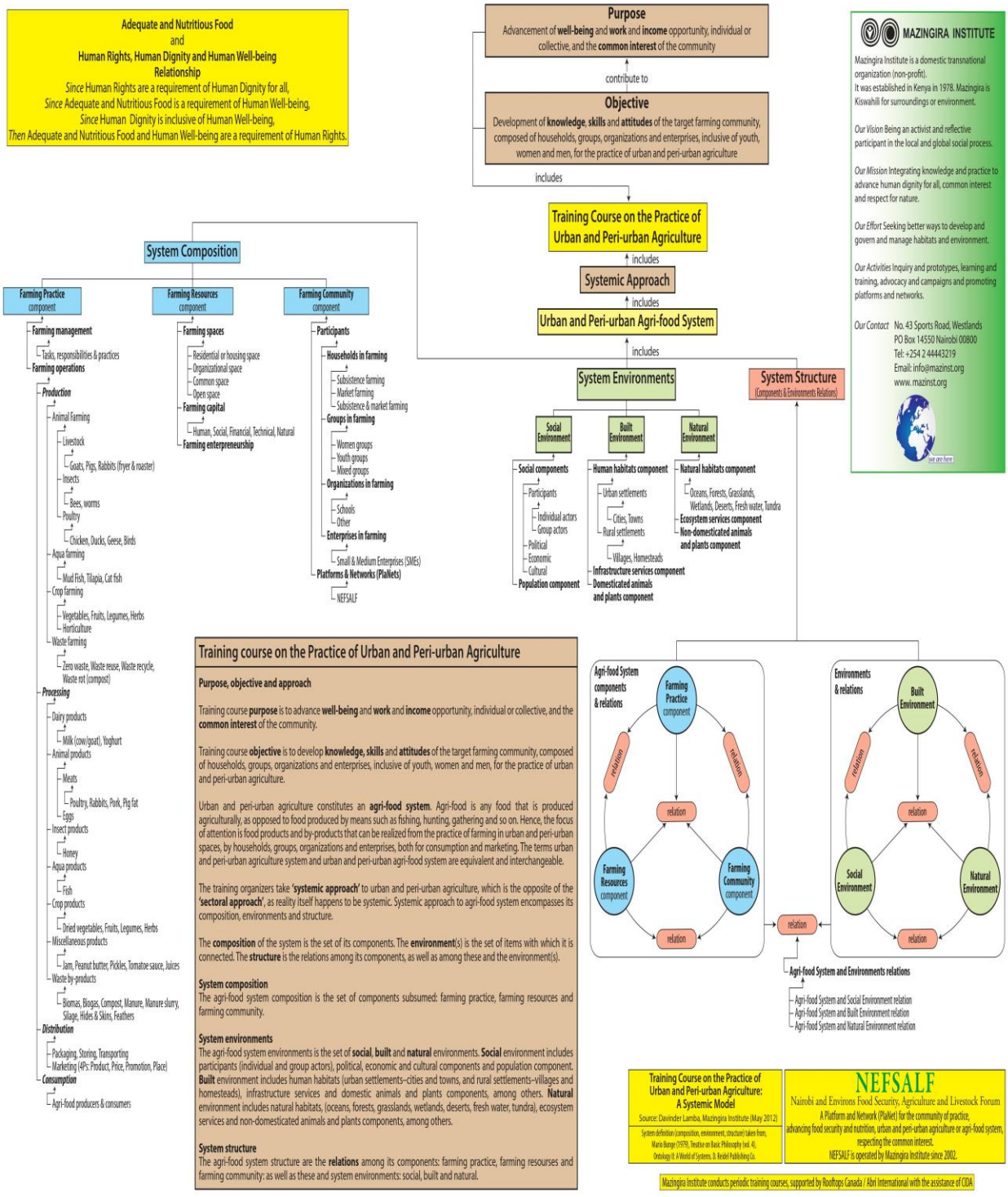
The research collected through this study reveals that training has had a positive impact on the participants interviewed. It demonstrated that even a short training and capacity building opportunity, in a setting that is supportive and reflective of the challenges of participants, women can develop and enhance farming practices improving their personal food security. While these results are based on a small, unrepresentative sample, the results are suggestive of the value of training and that there are important lessons to take away for future training and capacity building based on the model promoted by the Mazingira Institute. The study also reveals that the key informant groups involved all agree that urban agriculture has the potential to improve Nairobi's food insecurity. However, despite the perceived benefits, not all are in agreement that the benefits outweigh the risks. This study provides optimism that urban agricultural training in Nairobi will continue to impact the lives of urban farmers and ultimately help improve household food security and welfare.

There are many other cities that share the similar food insecurities as Nairobi, Kenya. Urban agriculture is a practice built out of need and opportunity and will continue on as urbanization and poverty levels rise in the developing world. As individuals, governments and organizations consider supporting urban farmers through capacity building it is hoped that this study will provide insight and direction into future training frameworks and follow-up.

APPENDICES

APPENDIX 1: Systemic Training Model

Detailed systemic model used by Mazingira for the urban agriculture training course



APPENDIX 2: Program Outline for October 2013 Training

DAY	Periods		
	8.30-10.30	**11.00-1.00**	**2.00-4.00**
Tuesday 15 Oct .	**Period 01** **Welcome & Introductions** **Overview of training course**	**Period 02** **Farming resources:** Farming spaces Waste matter use Farming capital	**Period 03** **Farming operations:** **Production** (Animal farming) Dairy cattle for milk
Wednesday 16 Oct	**World**	**Food**	**Day**
Thursday 17 Oct	**Period 04** **Farming operations:** Distribution Consumption	**Period 05** **Farming operations:** Processing (Dairy products) Milk & Yoghurt	**Period 06** **Farming operations:** Production (Animal farming) Rabbits for meat
Friday 18 Oct	**Period 07** **Farming operations:** Production (Animal farming) Pigs for meat	**Period 08** **Farming operations:** Production (Crop farming) Vegetables, fruits, legumes, herbs Crop protection from pests	**Period 09** **Farming operations:** Production (Insect farming) Harvesting bees in the wild Worm farming
Monday 21 Oct	**Period 10** **Farming operations:** Production &Processing Waste farming & waste by-products	**Period 11** **Farming operations:** Production (Animal farming) Poultry for eggs and meat	**Period 12** **Farming operations:** Processing (Crop & miscellaneous products)
Tuesday 22 Oct	**Period 13** **Farming operations:** Production (Aqua farming) Variety of fish	**Period 14** **Farming operations:** Production (Animal farming) Dairy goats for meat and milk	**Period 15** **Farming operations:** Production (Animal farming) Animal feeds and feed rations
Wednesday 23 Oct	**Period 16** **Farming resources:** Farming	**Period 17** **Farming community:**	**Period 18** **Trainee strategy development**

	entrepreneurship	Farming households & enterprises Platforms & Networks	
Thursday 24th Oct	**Period 19 Group dynamics**	**Period 20 Trainee strategy presentations**	**Period 21 Training assessment & closing**

APPENDIX 3: Questions Asked to October 2013 Training Participants

1. Are you currently farming? If so, what?
2. Does anyone help you with your farm?
3. Why did you join this training?
4. What do you want to get out of this training?
5. Do you sell your produce or is it for subsistence?
6. How did you hear about this training?
7. What is your long term goal after this training for yourself or your Shamba?

APPENDIX 4: List of Key Informants Interviewed

Date of Interviews: Saturday 12 October 2013

Informant Type	Gender	Age	Location of Interview
Past Participant B	Female	Approximately 50	Farm Visit
Past Participant D	Male	64	Farm Visit
Past Participant E	Female	Approximately 50 – 55	Farm Visit
Past Participant F	Female	Approximately 30	Farm Visit
Past Participant G	Female	31	Farm Visit
Non-Government Elite and Staff Member B	Male	Approximately 60	Farm Visit

Date of Interviews: Tuesday 15 October 2013

Informant Type	Gender	Age	Location of Interview
Private meeting with 5 Past participants (Past Participant F)	4 men and 1 woman	Under 35	Mazingira

Date of Interviews: Thursday 17 October 2013

Informant Type	Gender	Age	Location of Interview
Participant I	Female	52	Mazingira
Participant J	Female	65	Mazingira
Participant K	Female	52	Mazingira
Participant L	Female	27	Mazingira
Participant E	Female	62	Mazingira
Participant M	Female	61	Mazingira
Non-Government Elite, Diana Lee-Smith	Female	Approximately 65	Mazingira
Government Elite A	Female	Approximately 50	Mazingira

Date of Interviews: Friday 18 October 2013

Informant Type	Gender	Age	Location of Interview
Participant N	Female	42	Mazingira
Participant F	Female	45	Mazingira
Participant O	Female	Approximately 45	Mazingira
Participant G	Female	39	Mazingira
Government Elite C	Female	Approximately 50	Mazingira

Date of Interviews: Tuesday 22 October 2013

Informant Type	Gender	Age	Location of Interview
Past Participant C	Male	50	Mazingira
Participant P	Female	43	Mazingira

Date of Interviews: Wednesday 23 October 2013

Informant Type	Gender	Age	Location of Interview
Participant H	Female	22	Mazingira
Non-Government Elite and Staff Member A	Female	Approximately 25	Mazingira
Government Elite B	Female	Approximately 50	Mazingira

Date of Interviews: Sunday 3 November 2014

Informant Type	Gender	Age	Location of Interview
Past Participant A	Female	Approximately 30	Toronto, Canada

APPENDIX 5: Questions Asked to Past Training Participants

1. Are you currently farming? If so, what?
2. Does anyone help you with your farm?
3. Did your technical farm practices improve since you graduated from the training? If so, how?
4. Did your farm business improve? If so, how?
5. Do you sell your produce or is it for subsistence?
6. Are you connected with Nairobi's broader farming community?
7. Do you find the NEFSALF Forum beneficial? Please explain.
8. Did you meet your long term goal after this training for yourself or your Shamba? Please explain?
9. What challenges do you still face?
10. Do you consult and/or help others with their farm practices?
11. Do you use the services of the extension officers?

APPENDIX 6: Questions Asked to Diana Lee-Smith

1. What is the role of women traditionally in Nairobi and the wider Kenya? How could this impact the success of failure of UA?
2. Has Mazingira ever considered breaking up the training based on gender?
3. Can you explain the constitution changes with regards to women owning land? How will this effect UA? Why was it made an agenda item now and not years prior? Was there a catalyst?

APPENDIX 7: Questions Asked to Non-Government Elite

1. Are there any characteristics which help guarantee a farmer will achieve improved success post-training?
2. Can you tell me about more about the follow-up process post-training?
3. Are there any enhancements that you feel could make the training stronger?

APPENDIX 8: Study Timeline

Action	Date
Proposal Finalized	3 September 2013
Seminar Course	September to December 2013
Travel to Kenya for preliminary field studies	9 to 25 October 2013
Travel to Kenya for follow-up field studies	May 2014
Final draft of Thesis submitted for revision	December 2014
Final draft of Thesis submitted for accreditation	March 2015
Final Defence	April 2015

APPENDIX 9: May 2014 Follow-up Questions

The questions listed were asked to the October 2013 female training participants

1. Are you still farming?
2. How has your farm practices changed since the training?
3. Has your business grown? If so, how?
4. Do you feel more financially stable? If so, can you provide any examples that show improved finances?
5. Do you spend more time with other farmers now? What about extension officers?
6. Do you keep in touch with any of your fellow participants from the training?

APPENDIX 10: Questions Asked to Government Elite

1. Do you think that UA can assist in Nairobi's food security issue?
2. What is the role of women in UA?
3. What do you think are the benefits of training women?
4. What do you think are the challenges for UA?
5. What type of impact do you think this training has on the participants – specifically women?

APPENDIX 11: Questions Asked to Youth Hub Members

1. How has this training impacted your life?
2. What would you suggest to add that could add value to the training? Or what do/did you feel you were missing during and/or after the training?
3. What is the Youth Hub?

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GLOSSARY

CSFS	Ryerson Centre for Studies in Food Security
EO	Extension Officer
FAO	Food and Agriculture Organization of the United Nations
CGIAR	Consultative Group on International Agricultural Research
GAFSP	Global Agriculture and Food Security Program
ICESCR	International Covenant on Economic, Social and Cultural Rights
LDC	Least developed countries
MDG	Millennium Development Goals
NACHU	National Cooperative Housing Union
NEFSALF	Nairobi and Environs Food Security, Agriculture and Livestock Forum
SINA	Settlements Information Network Africa
UDHR	Universal Declaration of Human Rights
UNDP	United Nations Development Programme
UN	United Nations
UPAL	Urban and Peri-Urban Agriculture and Livestock
WFP	World Food Program
WFS	World Food Summit
WHO	World Health Organization