Global Scientific JOURNALS

GSJ: Volume 8, Issue 11, November 2020, Online: ISSN 2320-9186

www.globalscientificjournal.com

African Urban Agriculture and Food Security: Interrogating the Confluence of Gender and Sustainable Food Security in Kenya.

Awuor Ponge[1]
Department of Sociology, Gender and Development Studies, Kenyatta University.
Telephone: **+254 721 962 660**
E-Mail: **awuorponge@gmail.com I awuor.ponge@ku.ac.ke**

Abstract
The ability of people to be able to realize their right to food is critical in the whole world, but it is especially critical in the developing world. Many studies have been conducted on urban agriculture; however, there have been glaring gaps in knowledge. One of these gaps has been that of understanding the role and importance of urban agriculture as an income generating venture or source of income. Another gap has been on how urban agriculture is varied by gender, wealth and area of residence. This study seeks to understand the root causes of food insecurity in the urban and peri-urban settings in Kenya. It seeks to understand the gender implications of food insecurity and then to come up with possible policy prescriptions on how to address this issue. Urbanization displaces people and alters the livelihoods of many. Equally, urbanisation processes create competition between land use for agricultural production vis-a-vis for expanding urban settlements. Urban a agriculture plays a major role in food and nutrition security. Admitted however, in many cities there is the difficulty of accessing the land for agriculture production. Gender analysis can help scholars and policy makers understand the causes of food insecurity because women play very important roles in the food system, from production to its distribution. This study will involve a review of the literature that has come up that study the key variables for this study, namely the confluence of Gender, Food Security and Urbanisation. This review draws on best practice from the global context, the Africa context and trying to relate this with the East African context, and Kenya in particular. While there is great risk associated with urbanization and food security in Kenya, there are also many opportunities to respond to these challenges. The findings of this study provide a holistic perspective to the impacts of food insecurity on gender in the urban setting and the challenges that constrain urban agriculture; while also highlighting the main opportunities available; and finally giving policy prescriptions on how these challenges can be contained.

KEYWORDS: *Urban Agriculture; Gender; Food Security; Urban Futures; Sustainable Development.*

[1] **Awuor Ponge** is a Doctoral Candidate and Adjunct Faculty at Kenyatta University's Department of Sociology, Gender and Development Studies in the School of Humanities and Social Sciences. He is also an Associate Research Fellow in-charge of Research, Policy and Evaluation at the African Policy Centre (APC).

1. Introduction and Review of the Literature

1.1 Introduction

In many major urban centres in Africa in general, and Kenya in particular, there are some forms of farming activities, either in the built-up areas or in the outskirts of the urban areas. The farming activities are various and include *inter alia*: crop husbandry – whether cash crops or food crops; animal husbandry – whether poultry keeping or livestock keeping; there is also urban small-scale forestry as well as small-holder farm forestry; horticultural activities, especially the growing of garden plants as well as flowers, either for aesthetic effects or for commercial purposes.

Given the small space available in the urban centres for agriculture, coupled with the ownership mechanisms which limit private land ownership, most of the urban agriculture is conducted in very unconducive environments, especially along the road-sides; in between open spaces and parks, and in between houses; at the front or back of residential plots; some even cultivate between railway lines in land belonging to the Railways Corporation; some cultivate under power lines belonging to the Kenya Power Company; some along rivers and streams; while others cultivate in the middle of roundabouts or even reclaim quarries.

In a review of the literature, several factors have been identified as constraints to urban agriculture. These have been caused by various factors and some even being imposed by the government, the market forces as well as agencies that either directly or indirectly impact on agriculture in an urban setting. These constraints include lack of access to land for agriculture; physical security either of the human person or the agricultural enterprise; socio-cultural factors as well as political and economic considerations; poor organizational culture coupled with unclear institutional and legal frameworks. The urban farmers also face the challenge of limited access to agricultural inputs and post-production services, and this especially affects the poor urban dwellers; inadequate as well as inappropriate technical knowledge of urban agricultural practices; and lastly, of all the agricultural land use practices, urban agriculture is rated very poorly.

Women have for long been faced with precarious economic conditions, particularly when they are independently responsible for their households (Riley, 2013). Demand for agricultural products is greatly affected by urbanisation. The major changes occasioned by urbanisation are through population increases as well as associated dietary demands (Satterthwaite, McGranahan, & Tacoli, 2010). Of all the roles played by women in the food security chain, the most critical is that of food utilization for food security. This role outweighs all their other roles including food production, income generation as well as income spending.

It is therefore, important to ask from the urban households these four questions with regard to production of food in the urban context:

- From which sources do the poor urban households get their food?
- What is the frequency of getting food from such sources?
- Do the households have any other income strategies beyond formal employment?
- What level of income do the urban households generate from urban farm products?
- How does gender roles and responsibilities intersect with urban agriculture?

1.2 Background Information

The annual urban growth rate of sub-Saharan African countries is estimated at 4.58% (UN-HABITAT. (2008). This is a serious scenario that if not checked, then there is bound to be population explosion. This situation will particularly affect the cities in the global south, as it will lead to an increasing population coupled with heightened demand for major necessities of life, which include food, and the basic means of its production, which is land (Peprah, Amoah & Akongbangre (2014).

According to Alila and Atieno (2006), women constitute 75 percent of Kenya's agricultural labour force, but their productivity levels are greatly constrained as a result of gender inequalities. This limits their access to productive resources like land ownership, credit facilities and even agricultural extension services and technology.

Ambole (2015) has observed that as Nairobi expands, population rises; land for agriculture shrinks making urban farming extremely difficult. The people then cannot produce their own foods and have to rely on foods that are produced commercially. With this scenario, it makes the poor households even more vulnerable to prize shocks. For this reason, most of the poor households are barely surviving in the cities with most not being able to afford beyond one meal in a day. According to Awiti (2013), for agriculture to drive economic growth and social transformation in East Africa in the next 50 years, it will have to change fundamentally. For this to happen, land productivity will have to increase significantly, but this will be determined by advances in technology, and reduction of population reliant of subsistence farming.

In the contemporary urban economy, urban agriculture has been advocated as a means to address declining livelihood opportunities, growing vulnerability and poverty, persistent food insecurity as well as gender inequality (Crush, Hovorka & Tevera, 2011). To manage natural resources in a sustainable manner, city water resources as well as well as municipal solid wastes, must be utilised effectively both as sources of plant nutrients and growing containers (Peprah, Amoah & Akongbangre (2014).

Studies have identified that there is a close correlation between higher levels of gender inequality and food insecurity and malnutrition (FAO 2012; CIMMYT; 2014; Fåhraeus, 2014) and other nutrition deficiencies (FAO, 2012; Gallaher, 2015). Poverty has also been seen as a major driver of food insecurity. Some studies have indicated that poorer households headed by women have been known to provide more nutritional food for their children than those headed by men (Kennedy & Peters 1992).

Women are critical to processes and outcomes of food security and nutrition. Women face empowerment and participation challenges (IFPRI. 2010; Ng'ang'a, 2016; Kiplagat, 2017) that require structural change – not simply food security programs. These structural changes also entail changes in: Attention to women's health; Women's and girl's education; Women's participation in public and political processes; Public acknowledgement of, and engagement with, gender-based violence, especially but not only directed towards women and girls (Lemke, 2013).

Food security is essentially built on three pillars: food availability, food access, and food utilization (Hilderink., *et al*., 2012). An individual must have access to sufficient food of the right dietary mix (quality) at all times to be food secure (Maxwell & Frankenberger, 1992).

The converse holds true that if one has never had sufficient dietary quality at all times, then one can be rightly said to be chronically food insecure.

Kenya is a developing East African country with an area of 580,000 Km^2. Of its 40m population some 22% live in urban areas (PWC, 2015). The Global Hunger Index (GHI) estimated by the International Food Policy Research Institute (IFPRI) to measure and track global hunger ranks Kenya at number 55 behind such countries as South Africa, Uganda, Congo DR and Malawi, among other countries in terms of global hunger index indicating a serious food security problem (Ng'ang'a, 2016).

According to the Report by PWC (2015), under Kenya Vision 2030, the government aims to "transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030." To realise this vision, it is anticipated that agriculture will play a key role, given that the sector accounts for a huge percentage of total exports as well as export earnings.

Many studies have been conducted on urban agriculture; however, there have been glaring gaps in knowledge. One of these gaps has been that of understanding the role and importance of urban agriculture as an income generating venture or source of income. Another gap has been on how urban agriculture is varied by gender, wealth and area of residence. Admitted subsistence agriculture greatly contributes to food security in the urban areas as well as the rural areas, there is a knowledge gap in the significance of urban based subsistence production vis-a-vis commercial urban agriculture. Another glaring gap is in the gender implications of urban agriculture on food security.

1.3 Review of the Literature

1.3.1 Urban Agriculture and Sustainable Livelihoods

According to Crush, Hovorka and Tevera (2011), urban agriculture involves the production of plants and tree crops and animal husbandry on plot, in open public spaces and on unused privately owned land within the city and in the peri-urban zone. Many people in the urban areas utilise land for agriculture, of which they do not have legal access. All the same, it is worth noting that that many informal settlement dwellers in the urban areas, have used urban agriculture as a strategy to improve their well-being and livelihood.

Urban agriculture greatly contributes in improving households' access to food, especially during times of shortage. At the same time, urban agriculture contributes to income generation by selling surplus produce, and also contributes to improved health for the urban population by providing them with fresh and highly nutritious foods (Andersson, 2014).

The desire to produce food in the urban areas is usually triggered by household need for survival rather than the desire to produce for commercial purposes. This position has been supported by studies which indicate that food insecure households are far more likely than food secure households to engage in food production (Crush, Hovorka, & Tevera, 2011).

There is certainly a link between food security and urban agriculture. This link has been established in previous studies. The role that urban agriculture plays in combating urban hunger and malnutrition has been appreciated in various studies (Olima, 2004; World Bank, FAO & IFAD, 2009; 2015; Liru, 2014; Andres, 2016) by providing fresh low-cost nutritional

food, with ease of access (Pascal, & Rinck, 2009; Lee-Smith, 2010; Lemke, 2013; Andersson, 2014; Lagerkvist, 2014).

1.3.2 Participation in Urban Agriculture

Studies have documented evidence of increasing rates of participation in urban agriculture in the African continent (Arend, 2011; Crush, Hovorka & Tevera, 2011; Hilderink *et al,*, 2012; Hovorka, 2003; Andersson, 2014; Ambole, 2015; Baltissen & Betsema, 2016).. The evidence seems to suggest that urban cultivation has become a major strategy for food security, especially for poor urban households (World Bank, 2009; World Bank, FAO & IFAD, 2015; Kiplagat, 2017) and the newly urbanized across the African region (Crush, Hovorka & Tevera, 2011). Increasing urban population growth means increasing competition for land use and planning (IFPRI, 2010; Andersson, 2014; Satterthwaite, McGranahan, & Tacoli, 2010). This then implies that inefficient urban agriculture will face legitimate pressure for crowding out land (Ellis & Sumberg, 1998).

1.3.3 Indicators of Food Security

Food security can be measured by different indicators, based on dynamic determinants (World Bank, 2009; World Bank, FAO & IFAD, 2015), describing availability, physical and economic access, utilization, vulnerability, and outcomes, in terms of access and utilization (FAO, IFAD & WFP, 2013). According to Ponge (2013):

> ***"… food security does not depend on crop production alone whether at household, region or country level. It depends to a greater extent on people's ability to command the resources to acquire the food they need – whether this is through production, farm production of cash crops, other income-earning activities, employment or remittances."***

The Price Waterhouse Coopers Report (PWC, 2015) highlights the fact that food security's significance as a key geostrategic theme was confirmed in 2007-2008 when it emerged at the top of the international political agenda. Many urban dwellers rely on urban agriculture for either food consumption or income generation (Karanja & Njenga, 2011; Kassie *et al.,* 2012; PWC, 2015) as they sell high-value crops or non-food crops or raise livestock for sale (Satterthwaite, McGranahan, & Tacoli, 2010; Lee-Smith, 2010). According to USAID (2010), Agricultural productivity and income gains are necessary but not sufficient to eliminate hunger and malnutrition.

1.3.4 Role of Women in Urban Food Security

Women are responsible for nutrition in most homes, including the purchase and preparation of food (World Bank, 2009; 2012; USAID, 2010; Tacoli, 2012; Ng'ang'a, 2016). However, because of traditional norms, they often have limited access to education and control over resources (cf. Kabeer, 1999; 2007).

Studies have shown that when women are given an opportunity to manage the household finances, then unlike men, they are likely to spend this on family and household needs, especially nutritional needs and healthcare, and even payment of School fees for the children (Kabeer, 1999; 2007; Hovorka, 2003; FAO, 2011; IDS, 2014); therefore to empower the women by increasing their access to and control over strategic production resources, will play a great role in ensuring the attainment of food security for the vulnerable majority in the developing world (Arend, 2011; CIMMYT, 2014; Fåhraeus, 2014; Kiplagat, 2017) as this is compounded by the fact that the 'feminisation of poverty' is primarily if not exclusively income-based, and as such neglects important dimensions of women's

disadvantage (Tacoli, 2012). Women are greatly responsible for the production of household food, and for this matter, their role is critical in ensuring the dietary and nutritional diversity of their households (Andersson, 2014; Liru, 2014). They are generally responsible for selecting food purchased to complement staple foods and to balance the household's diet (World Bank, 2009; 2012).

1.3.5 Food Security Definition

The 1996 World Food Summit in Rome defined food security as the situation in which:

> ***"… all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life"*** (FAO, 2006).

Food security can be achieved at different levels, namely at the individual level; household level; national level; regional level or even at the global level. What is important however, is that for this to be realized, all the people, must at all times, have the social, economic and physical access to sufficient, safe, and nutritious food; that meets not only their dietary needs but food preferences as well for the realization of a healthy and active life (FAO, 2001; 2006).

Food availability means that there is consistency in either production or purchase of the food. Food access refers to the ability to use the resources or entitlement for purposes of obtaining the required food. Food use presupposes that one has the requisite knowledge of the dietary needs for good health; while Food stability is often used to describe the fluctuations over time in relation to food access, availability and also the ability to respond to sudden shocks in respect of food security (cf. FAO, 2006).

Table 1 – Food Security Indicators in an Urban Setting

Indicator	Measure
GENERIC	
Population pressure	- Population density - Nature of housing
Governance and policy	- National Policy on Urban agriculture - County Policy on Urban Agriculture
Environmental Considerations	- Degree of pollution of water - Degree of pollution of soil - Degree of pollution of air
AVAILABILITY	
Water availability	Renewable water resource: water runoff for domestic, industrial or agricultural use (irrigation)
Quality of the soil for rain fed agricultural production	Agro-potential: fraction of the productivity of a grassland compared to the maximum feasible
Pressure for land use change	Average travel km to the closest agricultural area (km)
Soil quality / erosion	Index for water erosion sensitivity of the soil
Soil conservation	Land degradation classes
ACCESS	
Income	- Average GDP per capita - Records of poverty levels
Non-farm income opportunities	- Urban population fraction - Poverty levels
Access to markets for products and technology	- Distance to markets - Infrastructure development

Indicator	Measure
UTILISATION	
Child nutrition status	- Prevalence of child malnutrition status in records - Health status of children in School - Hospital records of Health Status of Mothers

Source: Adapted from Hilderink, H., *et al*., (2012). *Food Security in Sub-Saharan Africa: An Explorative Study.* The Hague: PBL Netherlands Environmental Assessment Agency.

1.3.6 Availability Dimension

In addressing the availability issue for food security, one of the most important factors to address is the availability of land of good quality, which can produce an adequate yield. It is also important that the food substance is available at the time of need, for the urban dwellers to access it for utilization.

1.3.7 Access Dimension

The access dimension is about having sufficient resources for individuals and households to obtain appropriate foods for a nutritious diet and is strongly interwoven with poverty and the purchasing power that people have to buy food on the market. Indicators, such as income and income distribution, food prices, access to food markets, and infrastructure, are used to illustrate this dimension (Hilderink, *et al*.. 2012). This actually sums up the need for access to water and sanitation in the urban areas, as well as the poverty dynamics in the urban slums that impact greatly on the cost of food. Access may also be slightly linked to affordability. You cannot access food items if you can't afford them.

1.3.8 Utilization Dimension

The increased risks related to unsafe drinking water and lack of sanitation, are some of the most critical health risks related to food security. The food items must not only be available and affordable, but they should be in such a state as to ensure ease of use, without posing potential health risks.

1.4 Factors Contributing to Food Insecurity in Urban Areas in Kenya

Food insecurity in Kenya is caused by inadequate farming area, drought, inadequate knowledge, and ignorance among other factors. Despite attempts to increase food production and enhance food security, it is worth noting that only 18% of Kenya's territory is suitable for farming (Liru, 2014). According to the World Food Program (WFP, 2011 as quoted in Ng'ang'a, 2016), the average Kenyan family spends almost half of household income on food. While it is admitted that several factors have been at play in contributing to Kenya's food security crisis, the international financial institutions also have their fair share of blame on this, as they have undermined agricultural development, contributed to the drastic rise in food prices and exacerbated rates of hunger and malnutrition (Arend, 2011).

Evidence indicates that female-headed households:

> ***"… are disadvantaged when it comes to access to land, livestock and other assets, health care, markets and extension services. These inequalities are caused by inter alia, limited access to information, cultural practices that disenfranchise female heads of households or minimize the status of girls and women."*** (CIMMYT, 2014).

Table 2 – Links to Land Governance and Food Security in the SDGs.

SDG GOAL	OBJECTIVE	TARGET	LINKAGES
1	NO POVERTY	1.4: Equal rights & access for all to resources & basic services	• Secure access & control over land, property & natural resources • Secure access & control over economic resources — Microfinance — Technology
2	ZERO HUNGER	2.1: Hunger eradication & food access for all	• Sustainable agricultural production • Safe, nutritious & stable food supplies & consumption • Female health & food consumption patterns
		2.3: Increased agricultural productivity & incomes	• Secure access & control over land, property & natural resources • Secure access & control over economic resources — Inputs, knowledge, financial services, markets, value addition & non-farm employment
		2.4: Hunger eradication, food security & improved nutrition, & sustainable agriculture	• Sustainable food production systems • Resilient agricultural practices
		5a: Gender equality & empowerment	• National laws • Gender-sensitive reforms for women & girls • Access & control over land, property & natural resources • Access & control over economic resources

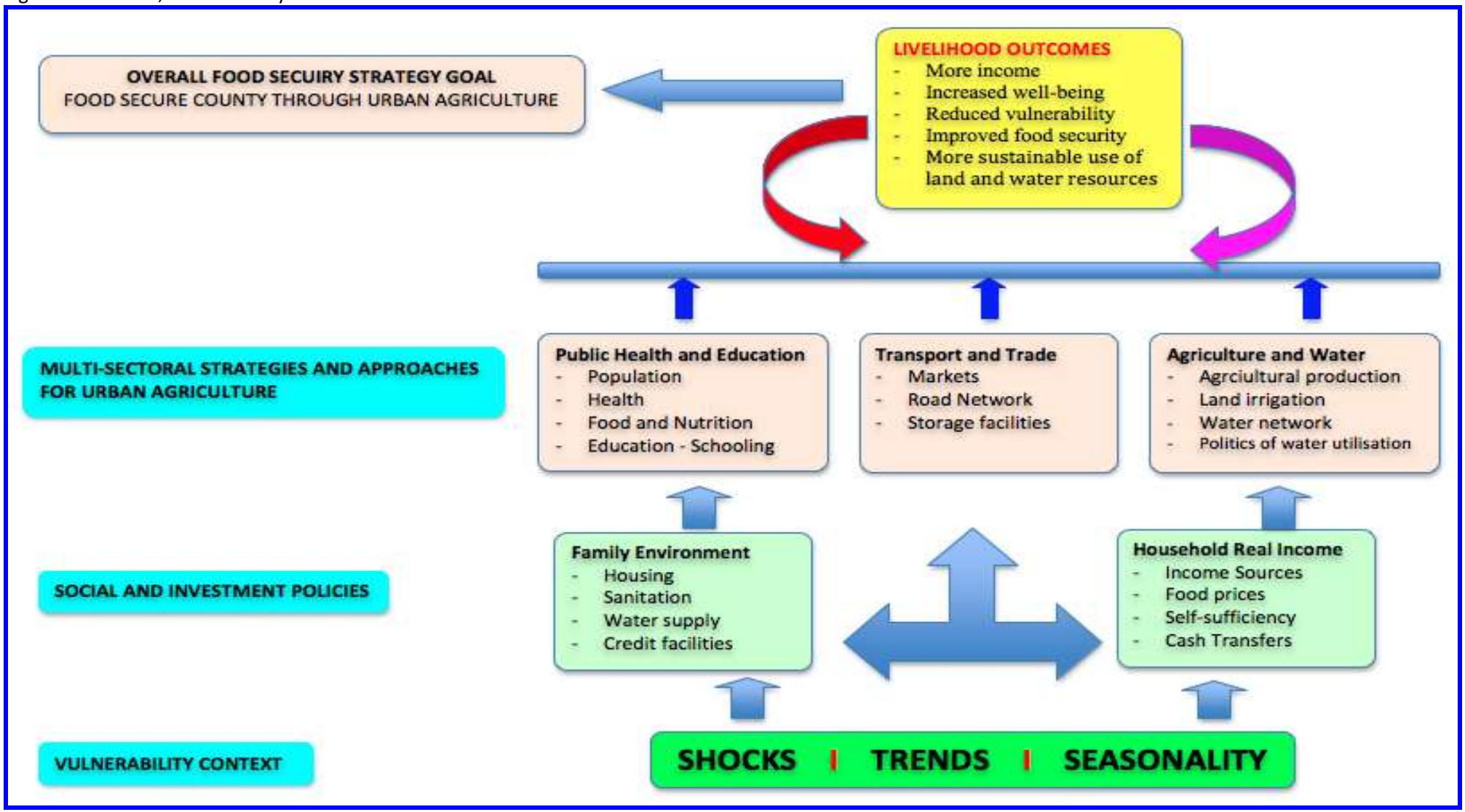
Source: Baltissen & Betsema (2016), Page 4.

1.4.1 Agricultural Policy in Kenya and Urban Agriculture

One of the key areas of concern in Kenya, at the policy level has been re-thinking the strategies of enhancing food security and reduction the number of people suffering from hunger and malnutrition. It is admitted the Agricultural policy has over time, not given prominence to urban agriculture as agriculture has been seen as a predominantly rural preoccupation. In fact according to Alila and Atieno (2006):

> ***"Agricultural policy in Kenya has revolved around the main goals of increasing productivity and income growth, especially for smallholders; enhanced food security and equity, emphasis on irrigation to introduce stability in agricultural output, commercialisation and intensification of production especially among small scale farmers; appropriate and participatory policy formulation and environmental sustainability."***

Figure 1 – Gender, Food Security and Sustainable Livelihoods Framework



Source: Author's Conceptualisation from various indicators.

1.4.2 Urban Agriculture and Emerging Issues

Awiti (2013) in his study on the Drivers of Agricultural Transformation is skeptical whether the smallholders in East Africa can replicate the success of the green revolution, which was fueled by smallholder farmers in Asia. He is equally skeptical whether this model can deliver agricultural transformation for East Africa. Of important concern, however, is the fact that like in the other regions of Sub-Saharan Africa, women in East Africa are playing an increasingly critical role in agriculture (Parker, Jacobsen & Komwa, 2009; IDS, 2012). In many instances, women bear the heavy burden of household chores including childcare. This division of labour greatly impacts on the levels and trends of technology adoption by women, especially for food security and also access to the markets.

Studies show that increasing women's access to productive resources like land and livestock; equitable access to educational opportunities as well as financial services; access to agricultural extension services; technology adoption and rural employment, all these combined, would boost the productivity of women and catalyse the gains in agricultural output and food security, and enhance economic growth and social welfare (Ostrom, 1990; FAO, 2011; Farm Africa, 2018). Because of this challenge of technology adoption and its implications for gender and urban agriculture, studies have made recommendations that to increase productivity, profitability, harness value addition, utilize technology, create well-paying jobs and boost rural incomes, East Africa's agriculture must undergo accelerated transformation (IDS, 2012).

Urban agriculture has a significant role to play in food and nutrition security in most low-income nations. The challenge, however, is that in many cities it is extremely difficult for the urban poor to get access to the land needed for agriculture (Lee-Smith 2010). The increased role of women in urban agriculture, is largely due to changing demographics, especially owing declining farm productivity, migration of men to urban centres, and disproportionate male morbidity and mortality owing to HIV/AIDS (Parker, Jacobsen & Komwa, 2009).

Across Kenya, the youth are predominantly engaged in off-farm jobs with quick returns, such as operating bicycle and motorcycle taxi. The youth do not view agricultural sector as a good employer. This is an emerging issue that must be addressed to ensure food security in the urban areas of Kenya, especially to capitalize on the demographic dividend. According to Opiyo and Agwanda (2011):

> ***"… the urban population in Kenya is growing very fast while the economic growth and development transformations necessary to support it and enhance the quality of urban life are not occurring at the same rate. Most of the migrants come as young adults, usually after secondary school with employment as the motivation for migration."***

Climate change is an emerging issue likely to impact greatly not only on the environment in general, but also agriculture in particular. To understand and address the complex relationship between climate change and agriculture will require interdisciplinary collaboration among a diverse set of experts and actors, from agronomists, and engineers to finance experts, regulators and policymakers. This therefore calls for a multi-stakeholder approach to addressing the issue of urban agriculture and its likely implications for the urban futures.

For purposes of increasing agricultural productivity in Kenya, one of the key policy drivers is capacity development, with a bias on agricultural technology transfer. Quite a good number of both state and non-state actors have been involved in capacity building, and technology in agricultural extension. However, it has in most cases been realized that women are not targeted in this technology capacity building. The general assumption, though not always the case; has always been that when the men undergo training, they usually share the knowledge with the women.

Another emerging issue is the effectiveness and efficiency of the technology that the people are supplied with; do they really meet their needs and demands? How do we determine appropriate technology?

1.4.3 Boosting Urban Agriculture

According to the Food and Agriculture Organization (FAO), their assistance in Kenya is shaped by their four-year Strategic Plan for 2014-2017. They have developed a Country Programming Framework (CPF)., which aims at among other things, boosting agriculture's competitiveness and production, while increasing food security for Kenyans. The framework focuses on five outcomes; among them: an increase in the productivity of medium-and small-scale agricultural producers, as well as diversification and alignment to the markets (Kenya & FAO, 2017). This is born out of the realization that the health of the people is a fundamental human right, and to improve this, safe and affordable food must be made available to the people. It is in the targeting of the small-scale agricultural producers that urban agriculture can be brought int focus.

Picture 1 – Urban horticulture within residential area

Source: Author.

A plethora of evidence abound in the literature (Ostrom, 1990; FAO, 2011; IDS, 2012; Andres, 2016; Ng'ang'a, 2016; Farm Africa, 2018), that safe food contributes to health and productivity and these combined lead to poverty alleviation, which results in development. In the wake of climate change and its effects on agriculture, studies have shown that adaptation and mitigation strategies reduce the vulnerability and also lessen the impact of climate change on the urban poor (IFPRI, 2010). What is not clear however, or at least not

already available in the literature, is how climate change and its effects can impact on urban agriculture in the Kenyan context.

Urban agriculture, especially through gardening in sacks offers a solution to both the lack of arable land and the lack of space. It allows the more vulnerable households to grow vegetables they would otherwise struggle to purchase, to diversify their diet, to save on the purchase of vegetables, while practicing an activity that brings them well-being (Andres, 2016).

1.5 Interrogating the Confluence of Gender and Sustainable Food Security

1.5.1 Challenges for Agriculture in the Urban Areas

Despite the positive achievements with regard to food security, enhanced livelihood strategies as well as access to nutritional foods, that have been highlighted, studies have shown that there are some major problems, in relation to food security, which may be associated with urban agriculture. These include: the increased risk for the spread of diseases from animals to humans as well as sanitary and environmental problems related to waste, water and manure (Andersson, 2014).

Studies already show that food grown in some of Nairobi's slum areas are contaminated with heavy metals such as lead (Ambole, 2015) and that soils and leaves were contaminated by *Escherichia coli* (Pascal & Rinck, 2009). Not so much has been done in this area, but the few studies that have been conducted could have been informed by the urban context in Nairobi, characterized by air pollution from the Industrial area, water pollution, especially from Nairobi River, the famous 'flying toilets' of Nairobi and solid waste pollution, as well as using land filled with solid wastes for agricultural purposes. Such revelations could scare off middle- and high-income earners who want to eat locally produced organic food and to support urban farmers from slums (Ambole, 2015).

There is the challenge associated with densely populated and land-constrained urban areas. According to Awiti (2013), urbanization brings major changes in demand for agricultural products both from increases in urban populations and from changes in their diets and demands Urban population growth is affected by the rate of rural-urban migration, which is influenced by policies affecting access to land and the returns to farming.

In many urban settings in the African continent, there is the lack of institutional structure and permits regulating land use. The effect of this is that there is little focus on how to govern and maintain, or even use public or common property resources in urban areas. This in turn, has an impact on the sustainability of the initiatives, both for urban environments and for cropping systems (Baltissen, & Betsema, 2016).

Picture 2 – Maize crops nearing harvest in a residential plt in Nairobi

Source: Author.

Food production through urban agriculture can be seen as an illustration of obstacles at different societal levels that are strongly interrelated. It displays a classic example of the utilization of common pool resources (Ostrom, 1990). As population becomes more urbanized and assuming per capita incomes continue to grow, the strain of feeding the residents of the cities dramatically rises (Awiti, 2013). In the words of Lagerkvist (2014), water has become scarce in the urban areas and increasing in cost, yet this is extremely essential for any form of urban agriculture. This in essence reduces the competitiveness of urban agriculture as compared to other forms of agriculture. The city residents, in a bid to overcome the water shortage problem in the urban areas, have devised several strategies. This has seen an increase in the utilization of sewage water for purposes of irrigation and also low-cost fertilizers from uncertified sources, both of which pose serious health risks to the farmers as well as the consumers.

Another challenge that is associated with increasing urbanisation is increasing population density. This coupled with lack of proper infrastructure for fresh water, means that farmers will continue to use the sewage water for agricultural purposes. Most of the urban areas do not have good working systems for rainwater storage and water reuse or recycling. There is not in place an integrated water resource use system, and even if this were to be put in place, the cost would be too prohibitive. So the County Government needs to do a cost-benefit analysis of putting this in place vis-à-vis the benefits of urban agriculture.

Sharing examples from Malawi, Riley (2013) noted that the decline in formal employment opportunities related to structural adjustment reforms and Malawi's economic stagnation made many urban households more vulnerable. Available employment in the formal sector tends to be temporary and poorly remunerated. Most people operate within the informal sector (Riley, 2013). It is this vulnerability that makes urban agriculture even more challenging in the African context.

In the case of Nairobi, the County Executive Committee Member for Agriculture, Livestock Development and Fisheries, Ms Anne Lokidor in an interview (Kweyu, 2014), mentioned

some of the earlier challenges that made it almost impossible to practice urban agriculture, which included the Public Health Act that empowers the minister to prohibit irrigation and cultivation around townships and the General Nuisance By-law. This law targeted the rearing of animals and birds such as chicken, cows, goats, and rabbits. The Land Control Act also restricted farming in the urban centres. It is important to mention that most of the land in the urban areas are privately owned, while in most cases, the poor who live in the urban and peri-urban areas, have no land of their own, and usually invaded private land to plant their vegetables and other crops. This is what the act was meant to prohibit (Kweyu, 2014).

1.5.2 Gender Analysis Checklist

Many people assume that in absolute numbers, women tend to dominate urban agriculture, especially I Sub-Saharan Africa. Actually, according to Fåhraeus (2014), women do constitute a significant majority of urban farmers in East and Southern Africa. In analysing urban agriculture and what it portends for the urban futures from a gender perspective, emphasis should be laid on the following key indicators:

- Gender and Human Rights
- Gender equality and Inequality
- Gender data disaggregation
- Gender in context – Understand gender relations in context
- Gender and ownership; Access and Utilization of resources
- Gender Input Involvement – levels of participation
- Gender output – benefit for men and women
- Gender impact – The differential impacts on men and women
- Division of labour.

We can use the Women's Empowerment Framework (Kabeer, 1999) to understand the normative expectation of the role of women in urban agriculture. According to this framework, women's empowerment entails the process by which a people who have been denied the ability to make strategic life choices acquire such an ability. So we need to go the extra mile and identify, how have women been denied the ability in the urban setting? And how are they acquiring that ability now?

For Kabeer (2007), to a large extent, the 'feminisation' of the global labour force goes hand in hand with urbanization, as it reflects a number of interrelated factors. Some of the factors that come to the confluence of urbanisation and global labour force include: the internationalization of production and trade and privatization of basic services and cuts to public welfare services. And at the confluence of gender and urbanisation, we have: rising levels of education, reduced fertility rates, changing aspirations among young women, and the need for cash incomes due to rising costs of living associated with urbanisation (Kabeer, 2007).

The confluence of gender and urban agriculture is also evident in the division of labour. It is evident that women are typically involved in what are normally referred to as "the easy jobs" like digging, planting and weeding; while men dominate in what are normally referred to as "the hard jobs" like preparing the land for sowing. In reality, urban plots are generally smaller and more continuously farmed, and this makes labour less strenuous. In view of the foregoing, given that there is not the possibility of the 'hard jobs' component in the urban setting, it logically follows that the job of urban agriculture is then left to the women. This in essence, is a perfect demonstration of how urban conditions may

contribute to changing traditional rural patterns of gendered divisions of labour within agriculture (Simiyu & Foeken, 2013).

Gender analyses of labour markets show that women face greater constraints than men (Kabeer, 2007). This position is corroborated by Tacoli (2012) who itemizes the constraints as concentration in informal sector activities; persistent social norms and values; increasing community workload; and limited access to formal types of employment (Tacoli, 2012). These constraints greatly help in advancing the argument for active involvement of women in urban agriculture, both as a source of food and also income generation, an employment source of sorts.

1.5.3 Gender Equality and Food Security

The 2012 World Development report, which was a study dedicated to Gender Equality and Development, appreciated the role of gender equality and it's place in sustainable development. It sends a clear warning that the failure by the key actors at the policy level, to recognize the roles, differences and inequities between men and women poses a serious threat to the effectiveness of the agricultural development (World Bank 2012).

Understanding food security requires that the concerned parties look beyond agricultural production to factor in such nuances as the nutritional value of food, the accessibility of food, as well as potential shocks in food access and availability. (Baltissen, & Betsema, 2016). Various studies have revealed that urban women are more likely than rural women to rely on income-generating activities (Tacoli, 2012). This is generally due to the fact that the urban residents depend more on monetarized economy than the rural women.

Despite their reduced social status, it is appreciated that women play a key role as direct food producers and as guarantors of household and child food security (Baltissen, & Betsema, 2016). However, because of the generally gendered legal and social norms, women's ownership, access to and control over land is very limited. According to CIMMYT (2014), the centrality of gender equity for inclusive development is a concept that is not contestable; and these are manifested through unequal access to educational opportunities to social norms that constrain the participation of women in development interventions and processes.

Urban food security depends on the ability of the households to produce or purchase food as compared to the other household needs that have to be purchased (Cohen & Garrett 2009). According to Fåhraeus (2014), there is no question that UPA as a livelihood practice is characterized by gendered divisions, ranging from divisions of labour to challenges, opportunities and benefits. Women are often responsible for household sustenance; thus, engaging in farming can be seen as a way to fulfil social expectations on women's roles (Fåhraeus, 2014).

Gender has been identified as a key issue in establishing the relationship between food production and food security systems, especially in the urban ecosystem. It therefore follows that gender must always be mainstreamed in any such analysis. Most of the research in this area from a gender perspective has tended to focus on issues ranging from the role of women as urban farmers to rendering their contribution to feeding cities more visible (Hovorka, 2003). According to IDS (2014), food and nutrition insecurity is a gender justice issue. Women and girls have borne the greatest brunt occasioned by the inequitable

global economic processes that govern food security systems. These global trends including the impacts of climate change have greatly impacted on women.

According to Kassie, Ndiritu and Shiferaw (2012), although African women are disproportionately responsible for providing food to their families both in female-and male-headed households, they have less access to, and control of, agricultural assets and inputs than men. For the cultivation of food crops, especially on family holdings, whether in the rural or urban areas, women continue to contribute the greatest source of labour, and this holds true even for the much of the labour that is required in the small and medium size holdings in the production of cash crops (Liru, 2014). Gendered food entitlements are highly contingent on dynamic factors such as cultural gender norms, changing priorities of governments, and the livelihood resources available in a given place and time (Riley, 2013).

Working in private households has been seen as a major source of employment, especially for the rural–urban migrant women. This goes ahead to confirm the fact that in many urban areas of low- and middle-income countries, domestic service remains a major source of employment for the women (Tacoli, 2012). According to evidence from a few studies conducted so far on this, the lack of attention to gender in agriculture, coupled with the rampant gender inequalities, greatly contribute to lower agricultural productivity and food production, with the overall cumulative effect of increasing the levels of poverty and under-nutrition, if not malnutrition (World Bank, FAO & IFAD, 2009; FAO 2011). Gender inequality and discrimination at the household level also prevent women from getting education which, in turn, has a negative impact on their decision making, production and marketing skills and contributing even more to food inequality in their households.

Access to land remains a major factor in urban and peri-urban production systems, coupled with this are clear gender dimensions. There is always the uncertainty regarding land ownership, and this is even made complex in the urban setting. This uncertainly of ownership and access certainly is an obstacle for long-term sustainable farming strategies in the urban areas. You do not know when the owner of the plot will come for it, neither when the Government decides to clear it for bringing up structures.

There are many factors that have contributed to women's vulnerability, especially in the field of agriculture. These factors could either be visible or invisible, but generally they all have to do with perceptions of the local social norms and traditions, which studies have not been able to capture effectively through quantitative statical surveys (CIMMYT, 2014). Different interventions have been shown to improve food security situation, for example participation in drylands irrigation, which has had significant impacts on household food security, attributable generally to the improvement in access to productive resources (Kassie, Ndiritu & Shiferaw, 2012).

1.6 Legal and Policy Provisions for Urban Agriculture in Nairobi City

1.6.1 Objectives of the Urban Agriculture Promotion and Regulation Act 2015

Section 3 of the *Urban Agriculture Promotion and Regulation Act 2015* (Nairobi City County, 2015) outlines the objects of the Act which include *inter alia:*

> ***"… to contribute to food security through the development of agriculture in the County by empowering the people and institutions through allowing and facilitating agricultural activities for subsistence and commercial purposes; promote increased access to agricultural extension services and promote the development of people's capacities in food production, value-addition, value chain development and employment creation; promote support and guide the development of urban agriculture within the County; as well as regulate access to land and water for use in urban agriculture within the County giving priority to residents of high density and informal settlements"*** (Nairobi City County, 2015).

1.6.2 Objectives of the County Integrated Development Plan (CIDP) 2013 – 2017

Urban agriculture has been seen as an important avenue through which the County could generate self-sufficiency in food production or supplement the food supplies from upcountry. Towards this end, the County Government has variously included this in the County Integrated Development Plans (CIDPs) of 2013 – 2017 (Nairobi City County, 2014) and of 2018 – 2022 (Nairobi City County, 2017). The sector objectives in the CIDP 2013-2017 were to:

- Create an enabling environment for urban agricultural development;
- Promote urban food security and safety; increase dissemination of agricultural information;
- Promote output and productivity of crops, enhance market access of crops, livestock, fisheries and their products; and
- Promote urban forestry and rehabilitation of degraded ecosystems. (Nairobi City County, 2014; 2017).

According to Nairobi City County (2014), the programme and project priorities for the period included developing policies that allow for urban farming and livestock keeping. For this, their target was to ensure that Urban-farming policy was developed; and the main activity to achieve this was through Review City By-Laws. Their second priority was to increase urban food security and to promote uptake of urban agriculture. The target for this was to construct five (5) greenhouses in each of the 17 sub-counties every year. And to achieve this, the County had to purchase various agricultural materials, green house, drip irrigation kits and roof water harvesting equipment. Lastly, they had set to increase dissemination of agricultural information as well as build the capacity of office and field staff on emerging issues in agriculture and urban development. The target for this was to establish 17 information desks in the County, and this had to be done through the purchase of books and reference materials for offices and information desks (Nairobi City County, 2014). Whether or not these were achieved, still remains to be seen and can only be ascertained through a comprehensive evaluation of the implementation of the CIDP.

1.6.3 Objectives of the County Integrated Development Plan (CIDP) 2018 – 2022

In the CIDP of 2018 - 2022 (Nairobi City County, 2017), the County Government of Nairobi, stress on the fact that they will zone land for agricultural production in the urban and peri-urban areas based on history, the present situation and sustainability for the future. In modernizing agriculture, the County Government will create an enabling environment for

urban agricultural development; increase dissemination of agricultural information; promote output and productivity of crops, livestock and fisheries; invest in value addition and value chain development of crop, livestock and fisheries for local, regional and international markets; enhance market access of crops, livestock, fisheries and their products; and promote animal health and welfare.

1.6.4 Provisions on Urban Agriculture and Urban Land Use Planning

According to Urbanlex (2015), apart from promoting urban agricultural land use, the Act (Nairobi City County, 2015) also sets to regulate the usage. It identifies some of the potential urban agricultural land uses, which include: food production, animal husbandry, cultivating land, market gardens as well as aquaculture.

The law seeks to provide for the institutionalization of procedures for the acquisition and administration of agricultural resources including land and organic waste; it seeks to set priorities for who to own and access these resources, with an emphasis on residents of either densely populated urban areas as well as those living in low-class informal settlement areas; or those who are vulnerable and marginalized as manifested in limited land ownership, limited employment opportunities and lack of resource capital for income generating activities.

The Act (Nairobi City County, 2015) emphasizes on urban agriculture being mainstreamed and included in the land use planning in the City. The mainstreaming also ensures that relevant Departments also have provisions for urban agriculture in their various legislations. These include development of a Food Policy, which should factor-in urban agriculture; Health legislation; Environmental considerations; as well as Urban Zoning procedures by the Ministry of Lands and Housing. The Executive Committee (CEC) Member in-charge of Urban Planning or Agriculture is tasked with the responsibility of making recommendations for incorporation of urban agriculture into the National Urban Areas and Cities Act through identification of areas for expansion and deepening of agricultural activities in the County (Urbanlex, 2015).

1.6.5 Promotion and Support for Urban Agriculture in the Act

In the second part of the Act on the promotion of urban agriculture, at Section 4, the Act provides that the Executive Committee Member shall ensure measures are taken to promote sustainable urban agriculture in the County. It provides further that urban agriculture may be carried out by means of structures that support agricultural activity, including toolsheds, greenhouses, livestock structures, fish structures, storage facilities such as silos and hay barns, produce stands, and instructional space.

1.6.6 Mandate of the County Executive Committee Member

The Executive Committee Member is given powers establish measures to promote best practices and regulate production, processing, marketing, grading, storage, collection, transportation and warehousing of crop and livestock products and inputs including organic waste within the County. The Executive Committee Member shall also, in consultation with the respective County Executive Committee Members, ensure the inclusion of urban agriculture in the planning process as a component of land use and food policy and zoning, marketing and market infrastructure.

1.6.7 Harmonizing County Legislation with National Legislation

It is the mandate of the Executive Committee Member to prepare a strategic plan for the

urban agriculture programs in accordance with Section 4 on ***General classification of urban areas and cities*** and 36 (l) on ***Objectives of integrated urban areas and city development planning***; of the National Urban Areas and Cities Act (Republic of Kenya, 2015) *[which is usually referred to as the forgotten legislation as it has not been effected]*, and shall also identify areas for the expansion or deepening of agricultural activities in the County. The County Act (Nairobi City County, 2015) finally provides that a person may engage in gricu1ture within the County subject to the Act, the relevant legislation and any other laws relating to Planning, Environment, Nuisance and Public Health.

According to the Urban Areas and Cities Act (Republic of Kenya, 2015), at Clause 37. Plan to align to county government plans, a City or urban area integrated development plan shall be aligned to the development plans and strategies of the county governments. At Clause 38 on the preparation of integrated city or urban development plans, a city or urban area shall prepare an integrated city or urban area development plan in accordance with the Third Schedule to this Act. The County Government should assess the social, cultural, economic and environmental situation in its area of jurisdiction; determine the needs of the community and align them to the Constitutional requirements; and lastly always seek to protect and promote the interests and rights of the minorities and marginalized groups and communities.

1.7 Practical Examples of Enhancing Urban Agriculture

1.7.1 Example 1: Kibera Slums Vertical Farms – Sack Farming

Sack gardening is a livelihood strategy now pursued by thousands of households in the Kibera slums of Nairobi (Karanja & Njenga, 2011). In answer to the glaring food insecurity problem in the urban areas, there have been recent government supported initiatives in slums such as Kibera vertical farms. In such initiatives, slum dwellers learn how to grow vegetables in sacks, thus making use of the available spaces within the densely populated Kibera. In one area, a dumpsite has been converted into a thriving garden that provides cheaper vegetables for the locals and a decent income for the farmers (Ambole, 2015). According to Mayoyo (2015), the residents of Kibera have found this vertical farming or sack farming as a new way of responding to the challenge of food insecurity in Africa's largest slum.

The sack gardens of Kibera consist of a series of sacks that are filled with manure, soil and small stones that enable water to drain. This approach has been lauded as a cheap and healthy solution to food insecurity in the slum as well as the runaway unemployment in Nairobi's slum (Mayoyo, 2015). These sack gardens do not require agricultural land or much water; are easy to prepare and do not require any specific technical knowledge; require simple and inexpensive materials (sack, stones, soil and manure); allow diversifying diets and thus address micronutrient deficiencies; increase income through the sale of surplus produce which are easily replicable (Pascal & Rinck, 2009). Sack-gardening therefore has the benefit of enabling the urban dwellers to not only diversifying their diet through the self-production of vegetables; but also for the households to make small savings from the reduced purchase of vegetables induced by self-production (Andres, 2016).

Picture 3 – Sack Garden in Kibera Slums

Source: Mayoyo, P. (2015). "How to grow food in a slum – Lessons from the sack farmers of Kibera."

In a study to evaluate the impact of sack gardening on household livelihood strategies in Kibera Slums, Gallaher *et al*., (2015) observed that:

> ***"… with their newfound knowledge about sack gardening, farmers reported feeling proud or more confident as a result. They felt healthier, happier, and more confident because they were better able to provide for their families or share their vegetables with their friends. They also felt that sack gardening had given women more confidence because of the challenges they undergo as part of farming."***

1.7.2 Example 2: Farm Africa Schools Initiative

Working with farmer groups and schools in Nairobi, Kenya, Farm Africa (2018) are helping young people and families to grow their own food and eat a reliable and nutritious diet. By developing high quality produce and improving access to markets they are also helping vulnerable groups such as unemployed youth to increase their income and improve food security in the long term. Farm Africa (2018) is supporting community members to include environmental conservation techniques and good agricultural practice in their urban agricultural systems while sharing nutritional knowledge to improve community understanding of the links between nutrition and health.

1.7.3 Example 3: The Hanging Gardens of Nairobi

One Entrepreneur, Brenda Anne has come up with a company under the name Ukulima Tech, in an agribusiness venture that targets urban dwellers. Their company helps urban dwellers to develop and install modern gardens that can be set up at the balconies or small urban compounds. The advantage of these gardens is that they are easy to control. They have even developed an Application that can be used to irrigate the gardens. They have both the horizontal gardens as well as the vertical (hanging gardens). These are really easy to manage as they can be placed on the balconies, rooftops or any outdoor place where the crops can access sunlight. In these gardens, the farmers can grow any vegetables,

flowers or fruits utilizing very small spaces around their houses or homes. The garden can also be used for aesthetic purposes to create stylish outdoor ambience (Merab, 2016).

Picture 4 – Growing vegetables in an unused plot in Nairobi County

Source: Author.

1.7.4 Example 4: Enhancing Food Security through Agribusiness

According to the newly appointed Nairobi County Executive Committee (CEC) member for Agriculture, Livestock, Fisheries and Natural Resources Bernard Mugenyo, the Nairobi County Government is rolling out multi-sectoral urban farming projects in all the 17 Sub-Counties aimed at giving impetus to enhance food security and address youth unemployment. It is being implemented through the County's Agriculture, Livestock, Fisheries, Forestry and Natural Resources department, under the banner, *"Enhance Food security through Agribusiness and urban and Peri-urban farming Technologies."* This project has seen youths from other counties engage in different activities derived from farming to add value to the products from their areas. The process, opens more avenues of revenue creation and gives taste to the end product, attracting a wider clientele and money to the youths (Mutai, 2016).

2. Recommendations

2.1 Recommendations for Policy Action

2.1.1 Linking Land Administration with Land Use Planning

The County Government of Nairobi should find appropriate ways in which land administration shall be linked with land use planning. This position is supported by (Baltissen, & Betsema, 2016), as this will ensure livelihood food security, to produce food crops for local markets, and to produce cash crops for increased on farm income. Policies should Include gender disaggregated data and analysis to inform land and food security planning, as women play a key role as direct food producers and as guarantors of household food security. This position is in view of the fact that food security and integrated water resources management are closely related to access to land, tenure security and collective user rights. There should also be legislation on the management of common property resources in the urban areas.

2.1.2 Promotion of Gender equity in Food Security

Gender shapes power relations in the household to determine how food is distributed among household members (Baltissen, & Betsema, 2016). The active involvement of men and boys is a prerequisite for sustainable gender equality in food and nutrition security. The County Government should come up with initiatives to challenge unequal land rights and reveal the transformative potential of engaging men and boys in gender and food security programming (IDS, 2014). In the food security project cycles, the promotion of women's full and equal participation could be realized through collecting sex-disaggregated project data. The anticipated project outcomes should also explicitly aim to increase food security, targeting the majority who are poor and vulnerable. Women and men should be empowered to develop and participate in actions and decisions related to sustainable land governance and improved food security.

2.1.3 Recognizing Food Security as a Basic Human Right

Inequality in food and nutrition security is perceived as discrimination. This is because the right to adequate food is a human right for everyone (IDS, 2014). To this end, the County Government should make provisions recognizing the right to food as a basic human right and provide mechanisms for fulfilling this. Vulnerability analysis needs to be conducted to assess the levels of food insecurity by assessing the social, economic as well as environmental changes, that affect the ability of women in the urban areas, to adapt or cope with the potential impacts of urban food insecurity.

2.1.4 Address Adaptation and Mitigation strategies and Climate change

The County Government working in partnership with the National Government as well as development partners, should address both the adaptation as well as mitigation issues with respect to climate change. This position is supported by IFPRI (2010), which holds that this would effectively reduce the vulnerability of the poor to climate change and other shocks as well as lessen the impact of climate change after it has occurred. According to Ambole (2015), there is need to ensure that the food produced is fit for human consumption, and to realize this, the authorities concerned should always yearn to mitigate environmental contamination. To provide a steady and reliable market for their produce, the farmers in the urban areas could link up with food outlets within the urban

establishment and beyond. These could include Supermarkets, Vegetable vendors, Hotels and restaurants as well as supply to the City Markets.

2.1.5 Investing in Innovative Smart Urban Agriculture

The County Government of Nairobi could come up with legislation for greening the rooftops in new commercial buildings. This would be a requirement that all new buildings to have provisions for rooftop agriculture or forest cover. They could partner with other stakeholders for investing in innovative smart agriculture like: Innovative water harvesting structures and systems, where the farmers collect water from a surface area and use this for irrigation; to ensure that the soil is protected by vegetation cover from being washed away in-between the crop production cycles, cover cropping should be introduced. Other innovative smart agriculture practices could include: improved, high-yielding varieties of grains, legume, fruit, and vegetable varieties; stress-tolerant varieties of crops; as well as zero-tillage practices.

2.1.6 Support for Women and Women Organisations

Since women in Kenya are the custodians of food security and nutrition at the household level, improving their education is the most important policy instrument Kenya can use to increase agricultural productivity, reduce poverty, and promote better health (Ng'ang'a, 2016). Establishment of Women's Groups should be enhanced, and financial and technical support provided to them, their capacity should also be built especially by providing them with information to ease their access to inputs, market outlets, credit and transaction costs that women face (Kassie, Ndiritu, & Stage, 2014).

Investment in transport and infrastructure is necessary to support women's market engagement thereby integrating women into value chains (World Bank, 2009). Social groups that uplift female headed households should be strengthened as social networks can enhance better food security outcomes, especially for the female-headed households. Given their propensity or susceptibility to vulnerability to food security shocks, when determining stakeholders and beneficiaries for nutrition, women should always be given the first preference. The authorities should liaise with local traditional leaders in beneficiary identification considering age, gender and culture. These should then be trained as community mobilizers as it will ensure community ownership and sustainability of the programme.

2.1.7 Integrating Urban Agriculture into formal County Planning

There is need for improvement of urban agriculture and this can be effectively realized by integrating it into the formal city planning processes. At the County level, this can be realized by the County updating its physical development plans, amending existing legislation as well as draw up an Urban Food Security Policy for the County. Olima (2014) also appear to support this position by emphasizing the need for various pieces of relevant legislation to be amended to facilitate and enhance urban agriculture to the benefit of the urban-resource poverty.

2.1.8 Promotion of Agribusiness for Employment Creation

The County should initiate policies on Agribusiness for employment creation to address the problems associated with youth idleness. Apart from the youths being involved in urban farming initiatives, there should be consideration for value addition to the farm products. It

is anticipated that this would enhance job creation opportunities for the youth as it will involve youths with varied skills and talents across the city, especially from the slum areas.

2.1.9 Public Private Partnerships and Investment Opportunities

Governance structures should allow for stakeholders' involvement, adequate capabilities to meaningfully participate in policy processes, and to generate adequate information. The County Government should work closely with the Private Sector to see how Public Private Partnerships (PPP) can initiate projects within the City environs especially in the high-density areas and informal settlements, with a view to giving not only incentives but also as a way of corporate social responsibility to the city residents. This should actually target the most vulnerable in the community. The PPP should identify the investment priorities in agriculture. They should analyze returns to different types of investment in both agricultural and non-agricultural sectors, as this can help inform the allocation of resources in terms of growth, food security, and poverty reduction. The PPP can also look at alternative business models and innovative initiatives such as impact investments, with the intention to generate a measurable, beneficial social or environmental impact alongside a financial return.

2.2 Recommendations for Further Studies

2.2.1 Research on Urban Agriculture as a Source of Food and Income

Studies should be conducted to determine how competitive urban and peri-urban agriculture will be in the future of the County, both as a source of quality and safe fresh produce, as well as for income generation, particularly targeting women and the most vulnerable in the urban areas.

2.2.2 Research on Water and Land Resources

Research should be conducted to assess the levels and efficacy of water utilization in the urban areas and find ways to improve water management and efficiency. Also a study should be initiated on gender and land access, ownership and utilization in the urban areas as well as sharing of common property resources in the County.

2.2.3 Research on Urban Poverty and Nutrition

Research should be conducted to help identify pathways out of poverty and food insecurity for the urban women and urban poor, as well as evaluate and design programs aimed at overcoming child malnutrition and nutrition deficiencies among the urban poor and vulnerable. Research should concentrate on the factors that account for poverty among the urban women and recommend strategies for improving nutrition among the poor urban households.

2.2.4 Research on Climate Change and Urban Agriculture

Research should be conducted to help find ways to effectively deal with climate change risks in the urban areas, while proposing appropriate adaptation and migration strategies. Research can also be conducted on the factors influence the adoption by women of innovative smart agriculture practices, as well as the most appropriate innovations that are context specific.

References

Alila, P.O. and Atieno, R. (2006). ***Agricultural Policy in Kenya: Issues and Processes.*** Brighton: IDS University of Sussex.

Ambole, L. A. (2015). **"The Case for More Urban Farming in Nairobi | Nairobi Planning Innovations."** Available Online at: https://nairobiplanninginnovations.com/2015/12/23/the-case-for-more-urban-farming-in-nairobi/ [Accessed on 5 July 2018]

Andersson, D. A. (2014). **"African urbanisation trends and implications for urban agriculture."** In U. Magnusson, & K. Follis Bergman (Eds.), *Urban and Peri Urban Agriculture for Food Security in Low-Income Countries: Challenges and Knowledge Gaps,* (pp. 6-10). Lund: Sveriges Lantbruksuniversitet.

Andres, A. (2016). **'Gardening in Sacks Handbook. A Technique of Vertical Agriculture.'** Solidarités International.

Arend, E. (2011). **'Gender, IFIs and Food Insecurity Case Study – Kenya.'** *Gender Action Policy Brief on Gender Justice and Women's Rights.*

Awiti, A. (2013). **'Drivers of Agricultural Transformation: Demography, Urbanization, Gender, Health and Human Capital.'** https://www.kilimotrust.org [Accessed on 16 July 2018]

Baltissen, G. & Betsema, G. (2016). **'Linking land governance and food security in Africa: Outcomes from Uganda, Ghana & Ethiopia.'** *Land Governance for Equitable and Sustainable Development, LANDac Reflection Paper.*

Beatrix Alsanius, H. A. (2014). **"Potential of Urban Horticulture to Secure Food Provisions in Urban and Peri-Urban Environments."** In U. Magnusson, & K. Follis Bergman (Eds.), *Urban and Peri Urban Agriculture for Food Security in Low-Income Countries: Challenges and Knowledge Gaps* (pp. 33-35). Lund: Sveriges Lantbruksuniversitet.

CIMMYT. (2014). **'Food security as a gender issue: Why are female-headed households worse off compared to similar male-headed counterparts?'** *Socioeconomics Program Policy Brief No. 1.*

Cohen, M. & Garrett, J. (2009). ***The Food Price Crisis and Urban Food Insecurity*****.** London, UK: IIED.

Crush, J., Hovorka, A & Tevera, D. (2011). **'Food security in Southern African Cities: the place of Urban Agriculture.'** *Progress in Development Studies*, 11(4):285–305. SAGE Publications, DOI: 10.1177/146499341101100402.

Ellis, F., & Sumberg, J. (1998). **'Food production, urban areas and policy responses.'** *World Development*, 26, 213-225.

Fåhraeus, C. (2014). **"Gender Dimensions of Urban and Peri-Urban Agriculture in Sub-Saharan Africa."** In U. Magnusson, & K. Follis Bergman (Eds.), *Urban and Peri Urban*

Agriculture for Food Security in Low-Income Countries: Challenges and Knowledge Gaps (pp. 17-20). Lund: Sveriges Lantbruksuniversitet.

FAO, IFAD, & WFP. (2013). ***The State of Food Insecurity in the World - The Multiple Dimensions of food security.*** Rome, Italy: Food and Agriculture Organization of the United Nations.

FAO. (2001). ***FAO's State of Food Insecurity 2001.*** Rome: FAO.

FAO. (2006). ***Food security, a policy brief.*** Rome, Italy: FAO. Available Online at: http://www.fao.org/forestry/131280e6f36f27e0091055bec28ebe830f46b3.pdf. [Accessed on 16 July 2018]

FAO. (2011). ***The State of Food and Agriculture 2010-2011. Women in Agriculture, Closing the gender gap for development.*** FAO Rome. Available Online at: http://www.fao.org/docrep/013/i2050e/i2050e00.htm. [Assessed on 31 January 2012).

FAO. (2012) ***The State of Food Insecurity in the World: Economic Growth is Necessary but Not Sufficient to Accelerate Reduction of Hunger and Malnutrition.*** Rome: FAO, http://www.fao.org/docrep/016/i3027e/i3027e.pdf [Accessed on 16 July 2018].

Farm Africa. (2018). **"Urban Gardening in Nairobi."** Available Online at: https://www.farmafrica.org/kenya/urban-farming. [Accessed on 11 July 2018].

Gallaher, C. M., WinklerPrins, A. M. G. A., Njenga, M., & Karanja, N. K. (2015). **'Creating space: Sack gardening as a livelihood strategy in the Kibera slums of Nairobi, Kenya.'** *Journal of Agriculture, Food Systems, and Community Development.* Advance online publication. Available online at: https://foodsystemsjournal.org/index.php/fsj/article/view/325 [Accessed on 16 July 2018]

Hilderink, H., Brons, J., Ordoñez, J., Akinyoade, A., André Leliveld, A, Lucas, P. & Kok, M. (2012). ***Food Security in Sub-Saharan Africa: An Explorative Study.*** The Hague: PBL Netherlands Environmental Assessment Agency.

Hovorka, A. (2003). **"Gender and urban agriculture: Emerging trends and areas for future research."** In Bruinsma, W. and Hertog, W., (Eds.), *Annotated bibliography on urban agriculture. ETC – Urban Agriculture Programme in cooperation with TUAN and other organizations*, 281–285.

IDS. (2012). **"Young People and Agriculture in Africa."** *Institute of Development Studies Special Issue*, 43(6).

IDS. (2014). **'Gender and Food Security Towards Gender-Just Food And Nutrition Security. Overview Report.'** *The BRIDGE Cutting Edge Programme.* Brighton: Institute of Development Studies.

IFPRI. (2010). **'Food Security and Economic Development in the Middle East and North Africa: Current State and Future Perspectives.'** *IFPRI Discussion Paper 00985.* CGIAR: International Food Policy Research Institute.

Kabeer, N. (1999). **'Resources, Agency, Achievements: Reflections on the Measurement of Women's Empowerment.'** *Development and Change*, 30: 435-464.

Kabeer, N. (2007). '**Marriage, Motherhood and Masculinity in the Global Economy: Reconfigurations of Personal and Economic Life'**, *IDS Working Paper 290.* Brighton: Institute of Development Studies.

Karanja, N., & Njenga, M. (2011). **"Feeding the Cities."** In L. Starke (Ed.), *State of the World: Innovations that Nourish the Planet* (pp. 109–111). New York: Norton.

Kassie, M., Ndiritu, S. W., and Stage, J. (2014). **'What Determines Gender Inequality in Household Food Security in Kenya? Application of Exogenous Switching Treatment Regression'**, *World Development*, 56: 153-171.

Kassie, M., Ndiritu, S. W. & Shiferaw, B. (2012). ***Determinants of Food Security in Kenya, a Gender Perspective.***

Kennedy, E. and Peters, P. (1992). **'Household Food Security and Child Nutrition: The Interaction of Income and Gender of Household Head.'** *World Development,* 20(8): 1077–85.

Kenya and FAO. (2017). **'Policy Brief – Partnering to build resilience and food and nutrition security.'** *Food and Agriculture Organisation, Policy Brief.* Rome, Italy: Food and Agriculture Organization of the United Nations. Available online at: http://www.fao.org/3/a-au195e.pdf [Accessed on 16 July 2018]

Kiplagat, J. (2017). **"Food Insecurity and How it affects Women at the Community Level."** Masters Degree Thesis presented to the University of Eastern Finland on 30 October 2017. Available online at: http://epublications.uef.fi/pub/urn_nbn_fi_uef-20180100/urn_nbn_fi_uef-20180100.pdf [Accessed on 18 July 2018].

Kweyu, D. (2014). **"Why City Hall is betting big on farming."** Available online at: https://www.nation.co.ke/business/seedsofgold/Why-City-Hall-is-betting-big-on-farming/2301238-2226214-l062vxz/index.html [Accessed on 11 July 2018].

Lagerkvist, C. J. (2014). **'Economic Drivers for Urban and Peri-urban Agriculture.'** In U. Magnusson, & K. Follis Bergman (Eds.), *Urban and Peri Urban Agriculture for Food Security in Low-Income Countries: Challenges and Knowledge Gaps* (pp. 11-15). Lund: Sveriges Lantbruksuniversitet.

Lee-Smith, D. (2010). **"Cities Feeding People: An up-date on Urban Agriculture in Equatorial Africa."** *Environ. Urban. 22.*

Lemke, S. (2013). **"Food Security, Sustainable Livelihoods and Gender in South Africa."** Paper presented at a Workshop on *"Gender and Food Security"* on 8 February 2013

at the University of Warwick. Department Gender and Nutrition, Institute for Social Sciences in Agriculture, University of Hohenheim.

Liru, P. N. (2014). **"The Contributions of Women towards Food Security in Malava Constituency, Kakamega County, Kenya."** MA Thesis, University of Nairobi. Nairobi: UON.

Maxwell, S, and Frankenberger, T. (1992). **"Household Food Security: Concepts, Indicators and Measurements."** Rome: IFAD. Available at www.ifad.org/ hfs/tools/hfs/hfspub/index.htm.

Mayoyo, P. (2015). How to grow food in a slum: lessons from the sack farmers of Kibera. Available online at: https://www.theguardian.com/global-development-professionals-network/2015/may/18/how-to-grow-food-in-a-slum-sack-farmers-kibera-urban-farming [Accessed on 16 July 2018]

Merab, E. (2016). **"Vertical and hanging gardens for the stylish urban farmer."** Available online at: https://www.nation.co.ke/business/seedsofgold/Urban-farming-meets-style/2301238-3093418-11shlhsz/index.html [Acccessed on 12 July 2018]

Mutai, Charles. (2016). **"A Hungry Nairobi City Explores Urban Farming."** Available online at: http://www.mediamaxnetwork.co.ke/234884/a-hungry-nairobi-city-explores-urban-farming/ [Accessed on 11 July 2018]

Nairobi City County. (2014). ***Nairobi County Integrated Development Plan (CIDP) 2013 – 2017.*** Nairobi- NCC.

Nairobi City County. (2015). ***Urban Agriculture Promotion and Regulation Act 2015.*** Nairobi: Government Printer.

Nairobi City County. (2017). ***Nairobi County Integrated Development Plan (CIDP) 2018 – 2022. Working Draft, November, 2017.*** Nairobi: NCC.

Ng'ang'a, T. K. (2016). '**Women's Experiences on Food Security in Kenya: Major Challenges that they Face.'** *Pathways to African Feminism and Development, Journal of African Women's Studies Centre.* Available online at: http://journals.uonbi.ac.ke/index.php/aws/article/view/1314 [Accessed on 17 July 2018]

Olima, W. H. A. (2004). '**Urban Agriculture in Kenya – Experience and Challenges.'** *RUAF Foundation, Global Partnership on Sustainable Urban Agriculture and Food Systems.* Available online at: https://www.ruaf.org/sites/default/files/econf4_submittedpapers_olima.pdf [Accessed on 14 July 2018]

Opiyo, C. O. and Agwanda, A. T. (2011). "**The Demographic Dividend: A Gift or a Curse?"** In Kitonga, Angela., Njonjo, Katindi, Sivi & Ponge, Awuor. (Eds.), *Youth Research Compendium.* Nairobi: Institute of Economic Affairs (IEA).

Ostrom, E. (1990). ***Governing the Commons – The Evolution of Institutions for Collective Action.*** New York, NY: Cambridge University Press.

Parker, D.C., K. H. Jacobsen, & M. K. Komwa. (2009). **'A quantitative study of the impact of HIV/AIDS on agricultural households in southeastern Uganda.'** *International Journal of Environmental Research and Public Health*, 6(8): 2113–2138.

Pascal, P. and Rinck, E. (2009). **'Soaring food prices and nutrition in urban areas – Sack gardens in Kenya.'** Food Security, Nutrition And Livelihoods: Lessons From Field Emergency Interventions. Prepared by the FAO Nutrition and Consumer Protection Division (AGN). Available Online at: https://www.permaculturenews.org/files/SackGardens_in_Kenya.pdf [Accessed on 16 July 2018]

Peprah, K., Amoah, S. T., & Akongbangre, J. N. (2014). **'Sack Farming: Innovation for Land Scarcity Farmers in Kenya and Ghana.'** *International Journal of Innovative Research and Studies,* 3(5): 29 – 44.

Ponge, A. (2013). ***Integrating Indigenous Knowledge for Food Security: Perspectives from the Millennium Village Project at Bar-Sauri in Nyanza Province in Kenya.*** Nairobi: ARRF.

PWC. (2015). ***Food Security in Africa : Water on Oil.*** London: PWC.

Republic of Kenya. (2015). ***Urban Areas and Cities Act, No. 13 of 2011.*** Revised Edition 2015 [2012]. Nairobi: Government Printer.

Riley, L. J. (2013). **"Gendered Geographies of Food Security in Blantyre, Malawi".** Electronic Thesis and Dissertation Repository, 1223. Available online at: https://ir.lib.uwo.ca/etd/1223

Satterthwaite, D., McGranahan, G. and Tacoli, C. (2010). ***Urbanization and its implications for food and farming.*** Philosophical Transitions of the Royal Society. (2010) 365, 2809–2820 doi:10.1098/rstb.2010.0136. London: International Institute for Environment and Development,

Simiyu, R., & Foeken, D. (2013). **'Gendered divisions of labour in urban crop cultivation in a Kenyan town: implications for livelihood outcomes.'** *Gender, Place & Culture,*1-17. doi:10.1080/0966369X.2013.810602

Tacoli, C. (2012). **'Urbanization, gender and urban poverty: paid work and unpaid carework in the city.'** *Urbanization and Emerging Population Issues Working Paper 7.* London: International Institute for Environment and Development (IIED) & United Nations Population Fund (UNFPA).

UN-HABITAT. (2008). ***State of the World's Cities 2008/09.*** London: Earthscan. Available online at: http://www.unhabitat.org.jo/en/inp/Upload/105056_Cover%20page.pdf [Accessed on 9 November 2012].

UrbanLex. (2015). **Urban Agriculture Promotion and Regulation Act. The Urban Law Database for UN Habitat.** Available online at: http://urbanlex.unhabitat.org/sites/default/files/urbanlex/nairobicitycountyurbanagriculturepromotionandregulationact2015_0.pdf. [Accessed on 11 July 2018].

USAID. (2010). ***Food Security and Gender – Fact Sheet*.** Washington, DC: USAID's Office of Women in Development.

World Bank (2009). ***Gender in Agriculture Sourcebook.*** E-Sourcebook available at: http://siteresources.worldbank.org/INTGENAGRLIVSOUBOOK/Resources/CompleteBook.pdf Gender and Food Security, Module 1. Washington D.C.: The World Bank. [Accessed on 11 July 2018].

World Bank, FAO and IFAD (2009). ***Gender in Agriculture Sourcebook.*** The World Bank, Washington D.C.

World Bank, FAO and IFAD. (2015). ***Gender in Climate-Smart Agriculture. Module 18 for Gender in Agriculture Sourcebook.*** *Working Paper.* Washington D.C.: The World Bank.

World Bank. (2012). ***World Development Report: Gender Equality and Development.*** Washington D.C.: The World Bank.