

**THE ROLE OF URBAN AGRICULTURE IN ENHANCING FOOD SECURITY IN
THE CITY OF NAIROBI: A GENDER PERSPECTIVE**

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DECLARATION


This research report is my original work and has not been presented to any other examination body or university.

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DEDICATION /ACKNOWLEDGEMENT

First I want to thank the almighty God for enabling me to come this far. My thanks to my husband Edward who has been very encouraging and supportive in the course of my work both financially and morally. Thanks to my children Simon, Caleb and Victoria for their patience and understanding when I had to be away doing this work.

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ABBREVIATIONS

UA-Urban Agriculture

UNDP-United Nations Development Program

UNICEF-United Nations Children's Fund

IDRC-International development research centre

NGOs-Non Governmental Organisations

ABSTRACT

This research study was based on urban farming in the city of Nairobi.

The study aimed at identifying the reasons for involvement in farming activities and if farming in the city has any contribution to food security.

It also had a gender perspective in terms of assessing which gender either men or women is more involved in the farming activities and why.

It looked at the challenges that these farmers faced and how they could be overcome.

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CHAPTER ONE

1.0 Introduction

This study sought to evaluate Urban Agriculture and its importance in urban food security in the city of Nairobi. It has a gender perspective in terms of assessing whether urban farming is a men or women affair, and the reasons. The study focused more on crop production as opposed to animal production.

Urban-based agriculture is distinguished from rural-based agriculture, in that it is integrated into the urban social-economic and ecological system: often it is embedded in - and interacts with- the urban ecosystem. Such linkages include the use of urban residents as labourers, use of typical urban resources (like organic waste as compost and urban wastewater for irrigation), direct links with urban consumers, direct impacts on urban ecology (positive and negative), being part of the urban food system, competing for land with other urban functions, being influenced by urban policies and plans, etc. Urban agriculture is not a relict of the past that will fade away (it increases when the city grows) nor brought to the city by rural immigrants that will loose their rural habits over time. It is an integral part of the urban system

1.1 Background of the Study

The history of urban agriculture in Kenya dates back to 1899 when railway workers, mainly from India started the practice in the mainland towns. The Indian urban farmers sold the surplus produce to European settlers. During the colonial era, African population in the urban centres was highly restricted. At the same time the colonial regime strictly enforced planning regulations that prohibited urban agriculture in certain places e.g.

roadsides and public open spaces. (Mireri, 2002.) Urban agriculture witnessed rapid growth despite restrictive urban planning and management regulations.

The high rate of urbanization associated with independent Kenya resulted in increased poverty in urban areas. An increasing number of poor urban families have resulted in urban agriculture to meet their food security requirement. (Mireri, 2002).

Since the late 1970's urban agriculture has been growing in many parts of the developing world. A plethora of factors come into play: rapid urbanization, ineffective agriculture policies, crippled domestic food distribution systems, constrained public spending and subsidies, wage cuts, soaring inflation and rising unemployment, plummeting purchasing power and lax urban land use, regulation or enforcement. These factors are multiplying and are recurrent. Their compounding effect is becoming so extensive and pervasive that a return to formality is gradually becoming precarious possibly in many parts of the world. This is why conditions sufficient to dampen growth of urban agriculture are increasingly unlike to happen in Africa. (IDRC, 1994).

Urban agriculture has been embraced and promoted by the international development community as a means for urban dwellers to achieve sustainable livelihoods and socio-economic advancement. Many low-income households who farm in the cities gain a more consistent source of food and better nutrition. They can also earn or free up cash for non-food items. Advocacy for urban agriculture was initially focused on the policy agenda, but has moved recently into the realm of municipal development. Now those municipal authorities increasingly recognize this pivotal activity, it is easier for urban agriculture practitioners to integrate it into planning and decision-making mechanisms at the city level. (Egziabher, 2003) This study sought to make clear why this trajectory must be

conceptualized along gender lines, since gender dynamics are central to the form, function, organization and structure of urban agriculture.

1.2 Statement of the Problem

Farming is being practised by a number of farmers in the city of Nairobi. Nevertheless the city bylaws outlaws farming except in designated areas. In the light of the foregoing statement, the number of farmers is increasing within the city. As such many open areas like backyards, river beds, unused passages, roads and rail reserves, among others are being cultivated for crop production. Therefore there seems to be a significant contribution of urban farming towards food security in families.

According to (Obudho, 2002), farming within the city of Nairobi is not a new phenomenon except that its intensity increased since the late 1980's. Recent studies have revealed that 50% of urban households in Kenya practice some urban agriculture. This rise in farming can be attributed to the increasing population and fall in purchasing power. In 1991, the employment growth rate in the city of Nairobi grew by only 1.1% while the total population growth rate was estimated as 4.9% (Central Bureau of Statistics (C.B.S. 1992).

As the populations grow within the urban areas, the challenge for securing their food situation has become very important to different stakeholders including the government, civil society and families among others. Therefore the question of the contribution of urban Agriculture to food security has become increasingly important and there is need to conduct a study so as to establish its importance. Further there is need to study factors are influencing involvement in urban agriculture and what gender is more involved in urban

agriculture and why. Additionally there is need to seek an understanding on what problems/challenges are the farmers facing during their activities while last and not the least, what gender is more involved in urban farming. This study focused on urban farmers dealing with vegetable production and other field crops for home consumption and income generation.

1.3 Objectives of the Study

- i. To determine the importance of urban agriculture in food security in Nairobi.
- ii. To determine some of the factors influencing involvement in urban farming.
- iii. To examine which gender is more involved in urban farming and why
- iv. To examine some of the challenges being faced by the farmers in the course of their activities.

1.4 The Research Question

- i. What is the contribution of urban Agriculture to food security?
- ii. What factors are influencing involvement in urban agriculture?
- iii. What gender is more involved in urban agriculture and why?
- iv. What problems/challenges are the farmers facing during their activities?

1.5 Justification of the Study.

Urban agriculture is wrongly considered an as of no importance. Despite its critical role in producing food for city dwellers around the world, urban food production has largely been ignored by scholars and agricultural planners; government officials .Policymakers at best dismiss the activity as peripheral and at worst burn crops and evict farmers, claiming that urban farms are not only unsightly but also promote pollution and illness.

1.6 Limitations of the Study

This study was limited because of a number of challenge which included but not restricted, personal security, during the study. some target areas had some security challenges due to their location like slums and valleys where some criminals often carried their activities. Funds and time were other limiting factors.

1.7 The scope of the Study.

This study was limited to the city of Nairobi in which two divisions were chosen for the study which included Westlands and Embakasi .The nature of the population is farmers farming within this area both men and women.

1.8 Hypothesis

Urban Agriculture is very important in the enhancement of food security in Nairobi.

There are many factors influencing involvement in urban agriculture in Nairobi.

There are more women involved in urban agriculture than men. There are many challenges/problems facing the development of urban agriculture in Nairobi.

1.9 Definition of Terms

1.9.1 Urban Agriculture

Urban Agriculture can be defined as the growing of plants and raising of animals within and around cities.

1.9.2 Food Security

Food security is defined as “access by all people at all times to the food required for a healthy life.”It addresses the risks of not having access to needed quantities and quality food (von Braun et al.1993, p3).

1.9.3 Gender

Gender can be defined as the socio-cultural construction of roles and relationships between men and women.

CHAPTER TWO

2.0 Literature Review and Theoretical Framework

The International Development Research Centre (IDRC), with its enviable perspicacity, became the first major international agency to recognize the importance of urban food production. In 1983, the urban section of IDRC under Yue-man Yeung funded a study of six urban centres in Kenya to be carried out by the Mazingira Institute of Nairobi. Additional studies and scholars have been supported over the last decade until the weight of reports and awareness of problems with urban food security has at last brought the issue to the forefront of IDRC's agenda. In the spring of 1993, IDRC organized two events designed to propel this policy concern to a wider audience: a policy and planning conference at the Ottawa headquarters and panels at the annual meeting of the Canadian Association for African Studies (CAAS), held in Toronto.

Africa south of the Sahara is the only part of the world where per-capita food production has fallen during the past decade. Inadequate rural food supplies are exacerbated by pressures of structural adjustment that reduce urban employment; the fall in prices of export crops both encourages urban migration and reduces the government's ability to purchase food stocks due to inadequate foreign exchange earnings. World food emergency supplies are currently under stress as demand grows as a result of widespread famine and war. Changing consumption patterns in the cities provide opportunities for commercial growing of foods not typically grown in rural areas, particularly vegetables. Together, these trends help explain the expansion of urban food production throughout the region.

Data drawn from all the studies support the importance of urban food production for both income and consumption. In Kenya, 67% of Nairobi's urban families are farmers but only 29% produce food within the municipal boundaries. Home-grown food is critical to maintain the nutritional status of the families: 25% of urban families in the six major cities in Kenya claim they cannot survive without self-produced food. Although most food is grown for consumption, 23% of the urban farmers sell some of their production, often buying fuel for cooking. About 30% of the women food vendors grow their own food. In Kampala, 50% of the land in the city is farmed by about 30% of the total population: 70% of poultry and eggs eaten in the city are produced there. Even the basic staple crop of tubers is grown in the city: about 20% is consumed by the growers, the rest sold. In Addis Ababa, the cooperative members are primarily growing vegetables commercially, but the families also consume some of their produce, saving 10-20% of their income that would otherwise be spent on food. In Mali, urban gardens are an important source of income and produce sufficient amounts to make Bamako self-sufficient in vegetables. Subsistence agriculture during the rainy season is also common. Zimbabwe takes a less lenient attitude toward urban gardens, particularly in Harare, than the other African countries discussed; around Bulawayo, crops raised along the riverbeds and poultry and pigs raised at home are generally tolerated. In contrast, in Bolivia, the government fosters urban gardening by community groups and in school yards as well as at home.

Surveys by Save the Children in Kampala indicate that the long-term impact on the nutritional status of children from poor homes that produced some of their own food was significant. Both Save the Children and UNICEF concluded from their surveys that

Urban Agriculture supplied sufficient food so that there was no need for supplementary feeding programs despite civil dislocation at the time. In Addis Ababa, the vegetables consumed by the farming families enhanced their diet. A thorough study done in La Paz compares food intake of poor and rich families. The study underscores the increasing dependency of Bolivia on food imports over the last decade. The poor only consume 80% of the recommended caloric intake; 65% of their food is supplied through food aid with 30% coming from rural production and the remainder from Urban Agriculture. In contrast, the rich consume 103% of needed calories, over 50% from imported foods. Given the dominant role that women play in agriculture in most societies in Africa south of the Sahara, it is no surprise to find that most farmers are women. The Kenya study records 56% female farmers in all six towns, but notes that the proportion rises to 62% in the larger cities. Of these women farmers, 64% are heads of households, a fact that illustrates how critical Urban Agriculture is to the survival of poor families.

There is a wide consensus that women cook and, in most cases, prepare food. Women also tend to shop or procure the food for eating in the home, which in some cases means growing it in kitchen gardens or keeping small livestock for milk and Eggs, for example. In other cases, it means saving some food from produce that they sell as traders. It can also mean that, when drought or economic crisis hits, women feel the pinch most, as they have to find some way to provide for their families, and this can lead them to organize collectively. Regional examples can be cited. The “glass of milk” programme where Latin American women organized to address urban hunger and disease highlights social movements and organizations that have emerged from this association of women and food supply in Latin America. The same applies to Asia, for example, the domestic stove

improvement programmes in India (Barring, 1991; Sarin, 1991). Thus in most societies, even where little or no food is produced within the household, women may be major actors in facilitating domestic food supply because of what Tripp calls the “moral economy” within which their work is located (Tripp, 1997). The strong association of women with subsistence production and the implications for economic development has been recognized for more than thirty years (Boserup 1970).

Numerous academic studies have addressed this issue regarding specifically urban areas, including a special issue of the journal *Environment and Urbanization* in 1991 and the International Research Seminar on Gender, Urbanization and Environment held in 1994 (Lee-Smith, 1994). It is important to recognize the distinction of women’s association with domestic food supply, as opposed to men’s roles in households as income earners or “breadwinners” when collecting and analyzing data on women’s roles in food production, including in urban agriculture.

Early research documents women’s participation in food production and trade in urban areas, as well as the policy-based impediments to their role in enhancing urban food supply and security. (Gayer 1987b) found that, in 1888–1912, women farmers would bring the small surplus they generated from family food production for sale in the town of Yaoundé. (Mitullah, 1991) describes something similar in early colonial Nairobi, and this is much more extensively treated in (Robertson’s 1997) work on men, women and trade in Nairobi. By the 1920s and 30s, the colonial division of labour meant men were working as urban or plantation laborers, whereas it was generally women who were farming and bringing in the urban food supply. In Dar-es-Salaam, (Bryceson, 1987) found urban wage-workers were fed by their wives in the 1930s. In Yaoundé, male

chiefs took advantage of this division of labour by “marrying” hundreds of “wives” who constituted unpaid work crews to supply urban food and profits for them (Guyer, 1987b). After independence in the 1960s and early 70s, rural women were both farming and trading to bring food to the city of Yaoundé.

In Kano, Nigeria, Hausa women’s food supply remained outside the purview of policy (and official attention) whereas Hausa men’s production and sale of staples on a small scale brought them into conflict and competition with large-scale traders and the authorities (Watts 1987). Studies of post independence food supply in both West and East Africa document how food production policies failed to take into account this gender division of labour and actively promoted men as opposed to women farmers (Guyer, 1987; Tripp, 1997). In the 1970s in Yaoundé, women continued to grow food for their families and sell the surplus, though this remained outside the purview of national food and agriculture policy. The national policy focus on rural agriculture may have actually increased urban agriculture production in Dar-es-Salaam according to Tripp (1997). In Dar-es-Salaam, where the women were bringing in food for the men in the early colonial city, only seven percent of laborers had farm plots in 1950. By 1974, when official food supply and distribution systems were in operation, 70 percent of households in an urban low-income settlement had urban agriculture plots, and in 1980 this had increased to 80 percent, with two thirds of the farmers being women. This is attributed to the malfunctioning of the official schemes, which failed to match supply and demand (Tripp, 1997).

A little-known but extensive study in periurban Kumasi, Ghana, raises interesting questions about the relationship between gender, land rights and food production

(Kasanga 2001). In examining how women have lost out in the control of land in the urbanization process, even where matrilineal inheritance of land is the norm, Kasanga states that: “There are more women farmers than male farmers in the peri-urban villages. They are also more likely to farm on family lands using a low-input bush-fallow system to grow food crops. These farmers are vulnerable to losing their farms to residential development. They are also constrained by a cycle of low productivity from investing in further farm development.” (Kasanga, 2001).

Clearly, the relationship between women’s association with providing food for the family as opposed to men’s association with growing cash crops, encouraged by official policy and social norms, has led not only to the current data about the prevalence of men in urban farming in Kumasi, but also to the disempowerment of women in a society that traditionally empowered them. Men tend to have access to greater amounts of resources.

An examination of the role of women as food traders into and within towns reveals a complementary picture, showing how normative expectations of the role of women intertwine with food policies that systematically ignore that role or, even worse, undermine the activities of women food traders or subject them to harassment. In 1973, women formed the bulk of food producers and traders for the urban market of Yaoundé. As a form of income and employment, food trading was the main occupation of urban women and women formed 89 percent of traders, half of them combining trading with food production in “rural” areas. Presumably, this would include peri urban or even urban production, since 45 percent of Yaoundé food came from the immediate hinterland. These women transported their produce by “head-loading” and they owned no vehicles. In 1968 women were accused of being responsible for rises in food prices and in 1972 market price controls were introduced that subjected women traders to harsh punishments. The women were reported to think high class people wanted merely to exploit them, but they had no political voice. Those who did have a voice claimed women

have “an obligation to feed us” and created a “disloyal competition” to trading through the official channels. (Guyer, 1987b)

Contemporary research on gender and urban agriculture documents clear gender dynamics in food production and trade in and around cities. There is now quite extensive case-study data on the prevalence of women as urban farmers in East and Southern Africa whereas, in West Africa, more men than women are found in urban agriculture as a rule. Thus, women predominate among urban farmers in Uganda, Kenya and Namibia, for example, whereas men predominate in Ghana and Nigeria (Obuobie et al., 2004; Kessler et al., 2004). Studies from Port Harcourt, Nigeria, and Senegal, however, note that women predominate as agricultural laborers and men as owners of horticultural enterprises (Oruwari, et al. 2004).

In Latin America, the pattern appears equally diverse, with women forming the majority of urban farmers in Rosario, Argentina (where emergency strategies in the face of economic crisis prevail) and men in Lima, Peru (where men are traditionally the cultivators). However, as articles in the issue of the Urban Agriculture Magazine devoted to Gender and Urban Agriculture show, things are changing in Lima as part of ongoing interventions and organized action by women themselves (Hetterschijt, et al. 2004). Little information is available from Asian cases, but the study from Nepal in the above-mentioned issue indicates periurban farming in Nepal is a family activity, with men and women playing different roles, but men controlling the land and the surplus production. The same appears true in Kolkata, India, here there is again a division between women’s unpaid work and men’s (assumed) role as income earners (Mukherjee et al., 2004; Sapkota, 2004).

Generally speaking, while both men and women are active participants in urban farming, the nature and extent of their participation varies in different contexts. The predominance of women urban farmers in many parts of Africa, for example, is ascribed to the fact that women still bear the main responsibility for household sustenance and well-being.

Women also tend to have lower educational status than men and therefore more difficulties in finding formal wage employment (Hovorka 2005). At the same time, the predominance of men urban farmers in many parts of Asia is attributed to the commercial nature of agriculture in and around cities. Men and women may differ strongly in their preferences and priorities related to their main roles and responsibilities, for example regarding production goals (enough food for consumption versus surplus products to sell at the market), preferred location of plots (women with young children often prefer to work close to the home), preferred mode of production (single versus multiple cropping) etc. (Wilbers et al., 2004). Men and women also have different responsibilities related to production and reproduction, depending on socio-economic and cultural circumstances. This division of labour relates to the types of tasks assigned associated with certain crops (e.g. cash crops or larger livestock versus food crops and smaller animals) and objective of cultivation (e.g. subsistence versus income generation). Beyond actual cultivation, men and women farmers participate in governance, local politics, and community groups, linking social activism with food security issues (Wilber's et al., 2004).

Gender dynamics also influence access and control over productive resources (including land, credit, labour and information), as well as access to and control over the benefits of production. While both women and men face constraints regarding access to

land, women are often further disadvantaged because they traditionally have less access to and control over land than men. Men tend to have the first choice of any available vacant plots of land; this leaves women with low-quality, less secure plots of land, or plots that are located far from their homes. Much time and effort must then be devoted to travel, which proves to be a significant constraint for women, especially the elderly or those with young children. Farming in remote and insecure places can also increase the risk for women farmers (Wilber's et al, 2004). Thus, it is important to acknowledge that increasing access to land as such may not solve the problem of inequitable access to urban land between women and men (Hovorka1998).

There is often also inequitable access between men and women regarding other agricultural inputs, labour, and information. Men and women differ with regard to their knowledge of, for example, the husbandry of certain crops and animals, the application of certain cultural practices and the use of certain technologies. Limited information on and exposure to the use of modern inputs and technologies may also be the result of limited access to training courses offered by institutions or NGOs. The fact that women are less likely to benefit from research or extension services that fail to consider gender-specific differences regarding methods of plant production, crop species and use of compost, manure and fertilizer also plays an important role (Wilber's, 2004).

Gendered access and control over productive resources are rooted in socio-economic conditions and legal arrangements whereby women are often disadvantaged through institutionalized gender inequities related to access to capital, education, and off-farm employment opportunities, as well as laws governing inheritance and land transfer.

Moreover, women often have rights to use renewable products (for example, harvesting leaves from trees), while men have rights of consumptive use (harvesting the tree itself).

Decision-making patterns are also highly gendered on account of differences in men's and women's ability to exert power and control within the household, community and municipality. Beyond recognizing such gendered experiences, access to resources and decision-making capacities, it is important to design an urban agriculture agenda that has gender needs at its core. As urban food markets evolve, women often continue to be disadvantaged.

2.0.1 Urban Farming in Kenya

Since 1980s in Kenya, UA by resource poor households has attracted empirical research because of rising urban poverty. The urban poor are the best placed people to assess the contribution of UA to their livelihood as shown by a number of empirical studies. The survey by Lee-Smith *et al.* (1987) covered six urban areas in Kenya, including Nairobi. The respondents were asked to state the consequences they would face if they were forced to stop urban farming. In Nairobi alone, 21% of them stated that they would starve, while 56% said they would be forced to buy food. In another study, Freeman (1991) sampled 617 respondents from people actually found carrying out cultivation activities in the open spaces of Nairobi. They ranked the incentives for UA in descending order of importance as follows: (1) to acquire basic subsistence against the alternative of hunger, threat of malnutrition or even starvation; (2) to supplement diet, particularly by growing kale and cabbage; and (3) to generate supplementary cash income and to increase fungibility. (Freeman 1991).

A subsequent study by Mwangi (1995) in Nairobi, agreed with the conclusion of the studies done in the 1980s that UA makes positive and significant contribution to household food security. The study assessed nutritional status of household members using data from one of the slums in Nairobi and found that farming households had higher energy and protein intake, as well as less stunting and wasting in children, compared to non-farming households.

However despite its positive role, city authorities shun it as a threat to public health for a number of reasons. (1) Producers, handlers, and consumers, risk contamination particularly from crops irrigated with contaminated wastewater or untreated sewerage. Crops grown on contaminated soils and zoonotic diseases from livestock living in close proximity with people are added health risks. (2) Others view UA as a nuisance and a safety hazard to people living in the vicinity of production areas, emanating from inputs used, including products and by-products of the activity (Margot, 2000). UA is also perceived to have negative environmental impacts that (Margot, 2000) cites as visual untidiness, soil erosion, destruction of vegetation, salutation of rivers, depletion of water bodies and pollution of soil, air and water. However, it is often overlooked that rural agriculture also poses potential health risk to the urban consumers if production, transportation, storage and handling of produce is not properly carried out (Lock and Zeus, 2001). Moreover, the health risks of UA are not intractable; they can be addressed through enforcing known standards for safe use of wastewater (Margot, 2000; IDRC, 1999). Ignoring UA and denying it support aggravates the public health risks because the activity still goes on. Passing general laws prohibiting it is not effective either. A viable alternative is to articulate policies that actively manage the health risks based on detailed

information on the actual health impacts of UA. Valuable insights can be gained from policy based on research findings on small-scale fresh milk vendors prompted by public health risk concerns after liberalization of the milk industry (ILRI, 2000). Such information however is not readily available (Lock and Zeeuw, 2001) possibly because UA as a production activity, particularly of resource constrained households, on land they do not own, has not attracted adequate research interest. Effective management of health risks underscores the need for urban policy makers and planners to move a step further from simply tolerating UA, to a more informed process of integrating the activity into the urban economic and ecological system. An understanding of the constraints likely to limit returns and efficiency of the activity at household level is part of the required information. The integration will ensure that the benefits of UA at all levels are enhanced while possible negative effects are mitigated

2.0.2 Gendered Urban Agriculture

A gendered perspective on urban food security is essential in understanding and explaining dynamics that shape the production and marketing of foodstuffs in and around urban centers. Without exploring the question of what role do women as distinct from men play in feeding cities, researchers, planners, and policymakers risk leaving unaddressed key local and structural issues and processes that shape gender inequities and hinder food supply at multiple scales. Such exploration necessarily counters the invisibility of specifically women's work in conceptualizations of food supply and security that assume food production and trade to be part of women's automatic and

everyday duties, related to the domestic sphere, and therefore not important in economic or political spheres.

2.1 Theoretical Framework

Urban population of developing countries is faced with the problem of surviving in towns where income generation is difficult due to diminished employment growth rates and urban living costs which are relatively high. Many people are moving from the rural areas to the city to look for better living conditions and employment. Thus the population in the city increases daily. This leads to increasing number of farmers in the city in the attempt to feed themselves. Subsistence production emerges from house gardens of those fortunate to have some backyard gardens and stretches of illegal cultivation that are found along roads, railways, rivers, dams and other peripheral areas.

Due to the growing population in the city however the amount of land available for farming keeps on reducing. The farmers illegally farm on land that does not belong to them hence faced with problems of crop security. Once the owner of the land is ready to develop the land their crops are destroyed. Bigger pieces of land are at the outskirts. Therefore one has to move to those areas of the city.

Water is a problem in the city, especially in areas where these farmers are located. It is not even adequate for domestic purposes. So many farmers tend to turn to use of sewage water which contains hard metals e.g. lead which is harmful to humans. This aspect can lead to people getting sick. Regulations governing urban agriculture are also a major drawback to the growth and development of agricultural activities within the city. These include:

The local government Act which gives every municipal council, country council or town council the power to prohibit the cultivation by an authorized persons of any ownership and of any government land and land reserved for any public road. The public health act empowers the Minister for health to prohibit cultivation or irrigation within and around townships where “the growing of any crop or the irrigation of any land being within the boundaries of a township or within three miles of such boundaries is unhealthy or unsanitary”.

The city council is duly appointed water undertaker under the water Act. The city of Nairobi (water supply) By laws (Ln 123 of 1974) states that the council may prohibit the use of water from the water supply for the purpose of “watering any garden, grounds or plants” by publishing a notice in the press and Kenya gazette. The By laws are violated only if such a prohibition order has been issued. The city of Nairobi has domesticated the concept of “nuisance” ala the Public Heath Act. For example city of Nairobi (general Nuisance) By-laws (Ln 275/1961) specifically prohibit cultivation but only on public streets. Any person who shall “dig, plough, till or cultivate any public street without written permission of the town clerk” shall be guilty of an offence. Section 2 of the same by laws defines a public street to mean a street maintained by the council. (Mukui J.K, 2002)

Freeman (1991) observes the actual enforcement of the bylaws is more liberal. The council ignores private backyard plots on enclosed residential ground and shambas of ground hugging food on vacant land, provided no crops are planted that will exceed four feet in height at maturity (obviously excluding sugarcane, bananas, cassava, pigeon peas

and maize). Tree crops, non-food crops grown explicitly for sale (e.g. coffee) are not tolerated within the city.

The low level of training among farmers can lead to poor growth and development of farming activities. This is because new farming methods, research findings, new inputs and innovations are passed on to farmers through this way. Due to unorganized farmers, scattered farming activities and relatively small land for cultivation is not easy to reach them. The farming land size owned by majority of the farmers is small. Thus some may not be economical in use of modern inputs e.g. fertilizers to increase soil fertility and use of pesticides to control pests and diseases or the farmers may lack the money to buy them. This leads to poor farming activities.

Crop insecurity is also a major issue. Theft is increasingly becoming a drawback to farmers. The produce is harvested and sold even before maturity by thieves. Animals may also destroy it. Other people may also use their plots as toilets thus rendering the farms unworkable. Gender equality should be one of the policies that the government should put in place. This is important in order to give every one equal chance to compete for any available positions of employment. Gender mainstreaming is important in any country. Proper audits of the gender balance institutions should be carried out. This helps in identifying the available gaps and creating a balance. Creating awareness on HIV and Aids is Important in that infection cases are reduced and therefore many people can work and fend for themselves. The pandemic has also led to increased number of Female headed households and orphans who later turn to farming in the city to get some food. All the factors discussed above will lead to increased food and therefore sustainable development.

CHAPTER THREE

3.0 Research Methodology

3.1 Study Design

The research design that was used during data collecting and analyzing data was survey design. This was because the population of farmers is big a representative sample was selected for observation and analysis. The methodology used was survey method.

3.2 Target Population

The target population was horticultural farmers in the city of Nairobi. (Isika, M. 2002) of the Ministry of Agriculture in Nairobi has stated that Nairobi province is divided into six Agricultural extension divisions which are headed by divisional extension coordinators. These divisions are Kasarani, Kibera /Langata, Embakasi, Westlands, Dagoretti and Makadara. The divisions are focal points of agricultural extension. Each division is further subdivided into extension units which are managed by Frontline extension workers. This study targeted small scale horticultural farmers in 2 divisions i.e. Kasarani and Westlands.

3.3 Sampling & Sample Design

Since the farmers were not located in one place, the purposive method of sampling was used where by a total of 75 farmers were interviewed, 38 from each division.

3.4 Data Collection Instruments and Procedures

A semi-structured questionnaire was used during the research. The data collection included access to farming land, household demographic data, and use or purpose e.g. for

food or income source, land size , its location, ownership, farming regularity, types of horticultural crops grown, input utilization, water availability, amount of produce, marketing avenues

3.4 The Data Collection Procedure.

The questionnaire method was used. This structured questionnaire with both open ended and closed ended questions was used to collect both quantitative and qualitative data.

3.5 Data Analysis Procedures

Data collected was analysed using descriptive statistics which included percentage, graphs, tables and qualitative techniques. This is because the data obtained was both quantitative and qualitative.

CHAPTER FOUR

4.0 FINDINGS AND DATA ANALYSIS

4.0.1 Introduction

This chapter avails the findings of the study as wells as the analysis of the study data. This is based on the responses from the data instruments distributed to the respondents. This forms the basis on which the conclusions and recommendations of the study are made.

4.0.2 Response Overview

The researcher distributed a total of 75 questionnaires for the study. Of this, a total of 60 questionnaires were received back from the respondents. This represents a response rate of 80% on all the questionnaires distributed for the study. Of the 60 questionnaires returned a total of 55 questionnaires were well filled out and complete as to be used for analysis as, representing 75% of the initially distributed questionnaires. The researcher found the 92% (55 questionnaires) response suitable and qualified for analysis of the study.

4.1 Quantative Analysis

4.1.1 Gender and Age of the Respondents

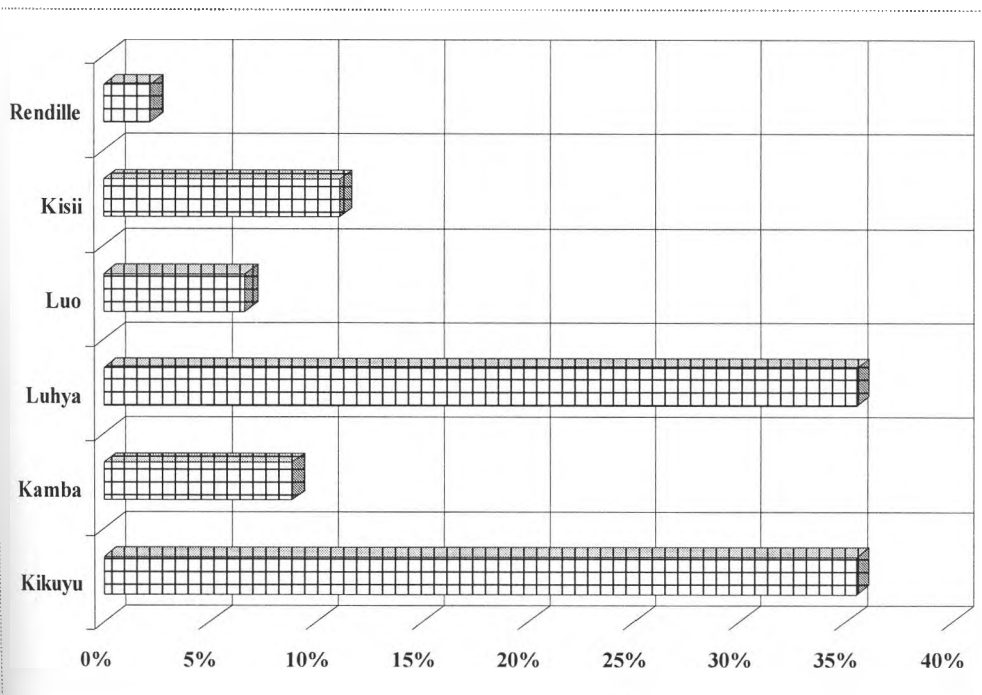
On the gender of the respondents 53% were male while 47% were female while on the age of the respondents none were below 15 years, 9% of the respondents were aged between 16-25 years. Majority of the respondents (49%) were aged between 26-35 years. Another significant number (42%) of the respondents was aged above 45 years.

4.1.2 Ethnic Background

Table 1.0: Ethnic Background

Tribe	Frequency	Percent
Kikuyu	16	36%
Kamba	4	9%
Luhya	16	36%
Luo	3	7%
Kisii	5	11%
Rendille	1	2%
	45	100%

Fig 1.0: Ethnic Background



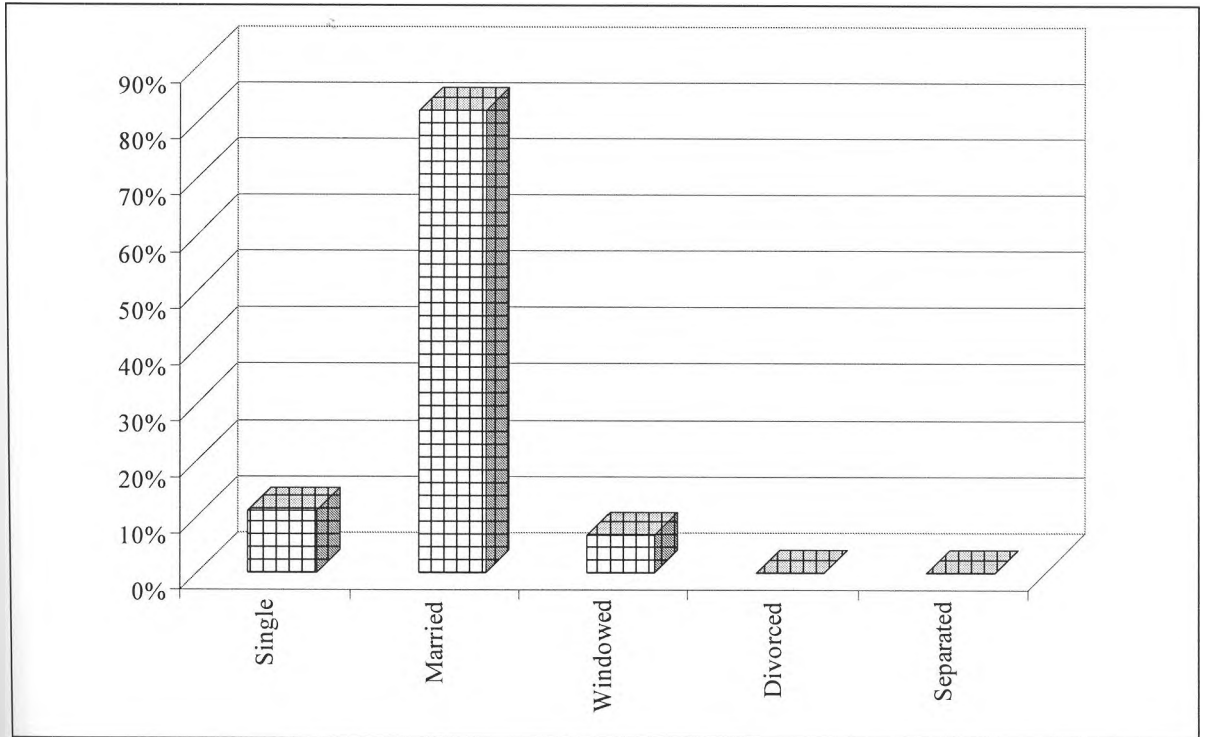
On the ethnic background of the respondents, the Kikuyu and the Luhya community accounted for 36% each, while Kisii and Luo accounted for 11% and 7% in that respective order. The Kamba and Rendille communities accounted for 9% and 2% respectively.

4.1.3 Marital Status

Table 1.1: Marital status

	Frequency	Percent
Single	5	11%
Married	37	82%
Windowed	3	7%
Divorced	0	0%
Separated	0	0%
	45	100%

Fig 1.1: Marital Status



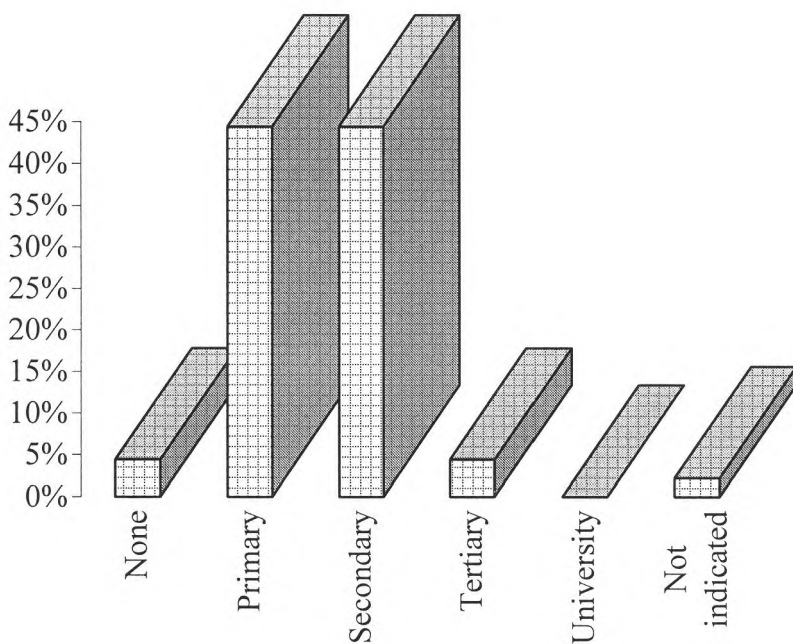
On the marital status of the respondents, the married persons were the majority accounting for 82%, while singles and Windowed accounted for 11% and 7% respectively. None of the respondents was either divorced or separated.

4.1.4 Level of Education

Table 1.3: Level of Education

Level	Frequency	Percent
None	2	4%
Primary	20	44%
Secondary	20	44%
Tertiary	2	4%
University	0	0%
Not indicated	1	2%
	45	100%

Fig 1.3: Level of education



On the level of education, those that had no education at all accounted for 4% of the respondents, while those that had attained primary and secondary level of education accounted for 44% each. Only 4% of the respondents had attained tertiary level of

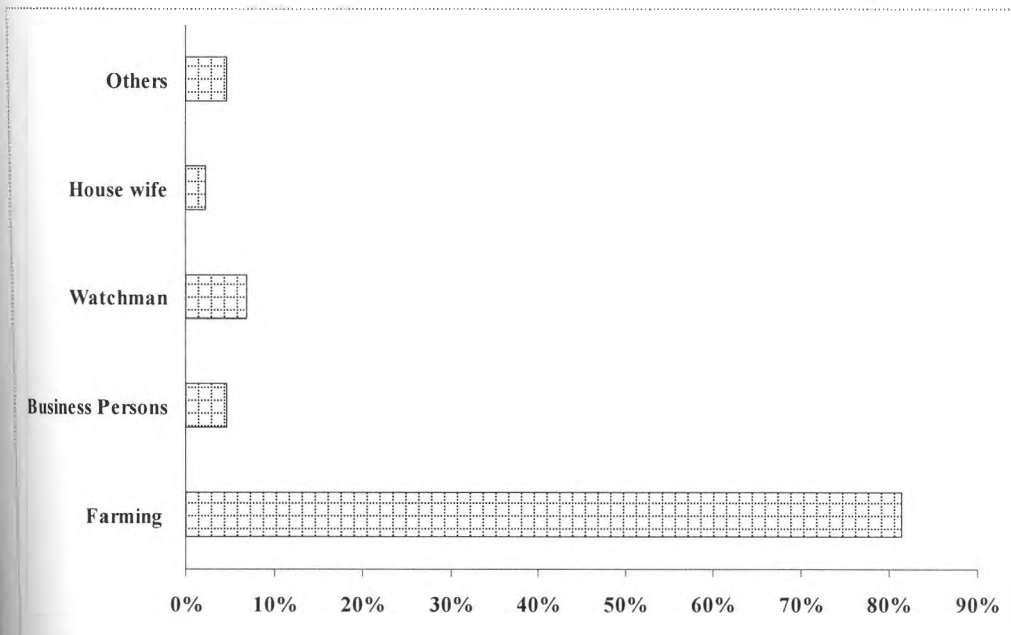
education, while none had attained the university level of education. A small group (2%) did not indicate their level of education

4.1.5 Occupation

Table 1.4: Occupation

	Frequency	Percent
Farming	35	81%
Business Persons	2	5%
Watchman	3	7%
House wife	1	2%
Others	2	5%
	43	100%

Fig 1.4: Occupation



On the occupation of the respondents rather than farming, majority (81%) indicated that they were only involved in farming, while 7% were watchmen. Only 5% and 2% of the

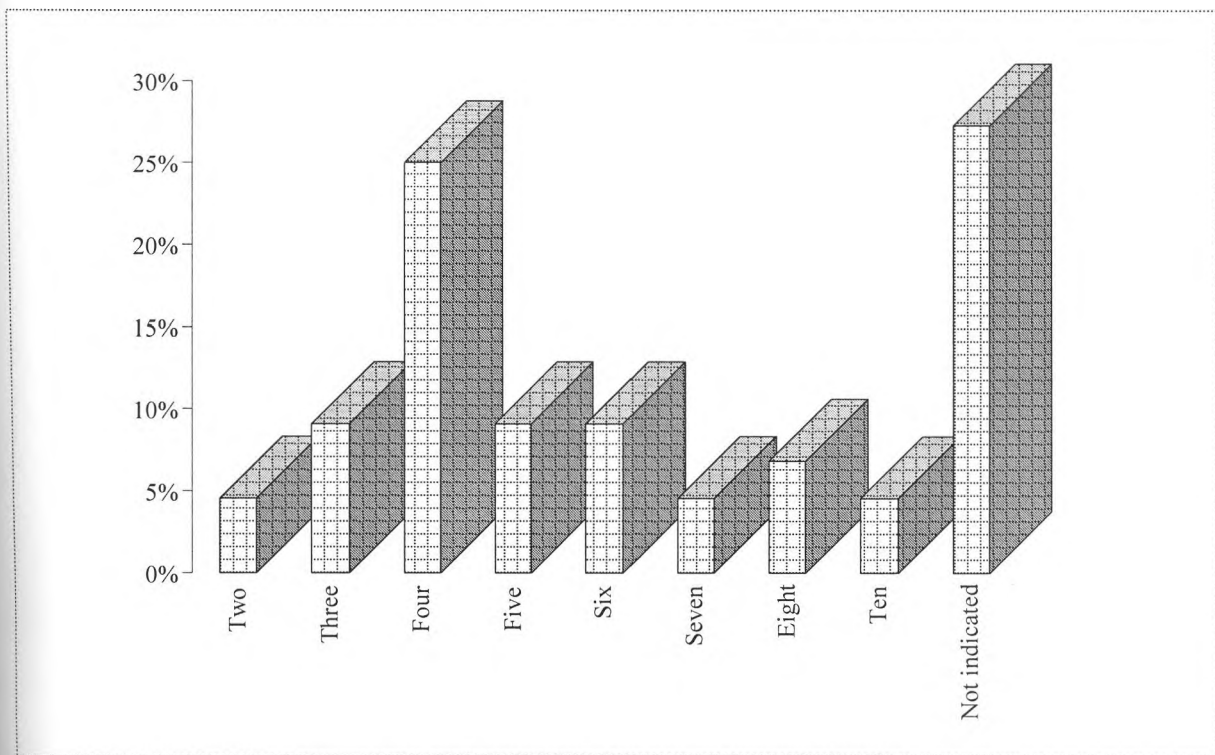
respondents indicated that they were either business persons or housewives. A number (5%) of the respondents were not categorized in any way

4.1.6 Number of dependants

Table 1.5: Number Of dependants

	Frequency	Percent
Two	2	5%
Three	4	9%
Four	11	25%
Five	4	9%
Six	4	9%
Seven	2	5%
Eight	3	7%
Ten	2	5%
Not indicated	12	27%
	44	100%

Fig 1.5: Number of dependants



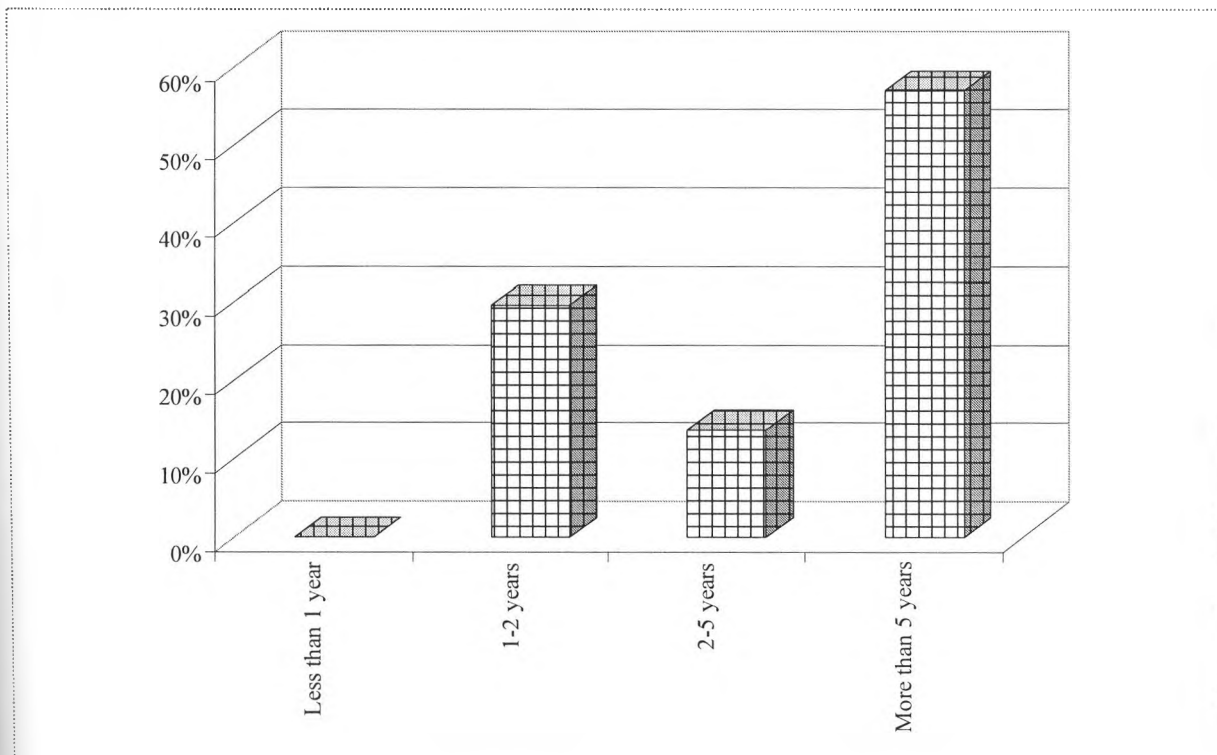
On the number of dependants that the respondents take care of, majority (27%) did not indicate the number of dependants under their care. Another 25% indicated that they took care of 4 dependants. Those that had two, seven and ten accounted for 5% each, while those that had three and six dependants accounted for 9% each. Those that had eight dependants accounted for 7% only.

4.1.7 Length of time in farming

Table 1.6: Length of time in farming

Duration	Frequency	Percent
Less than 1 year	0	0%
1-2 years	13	30%
2-5 years	6	14%
More than 5 years	25	57%
	44	100%

Table 1.6: Length of time in farming



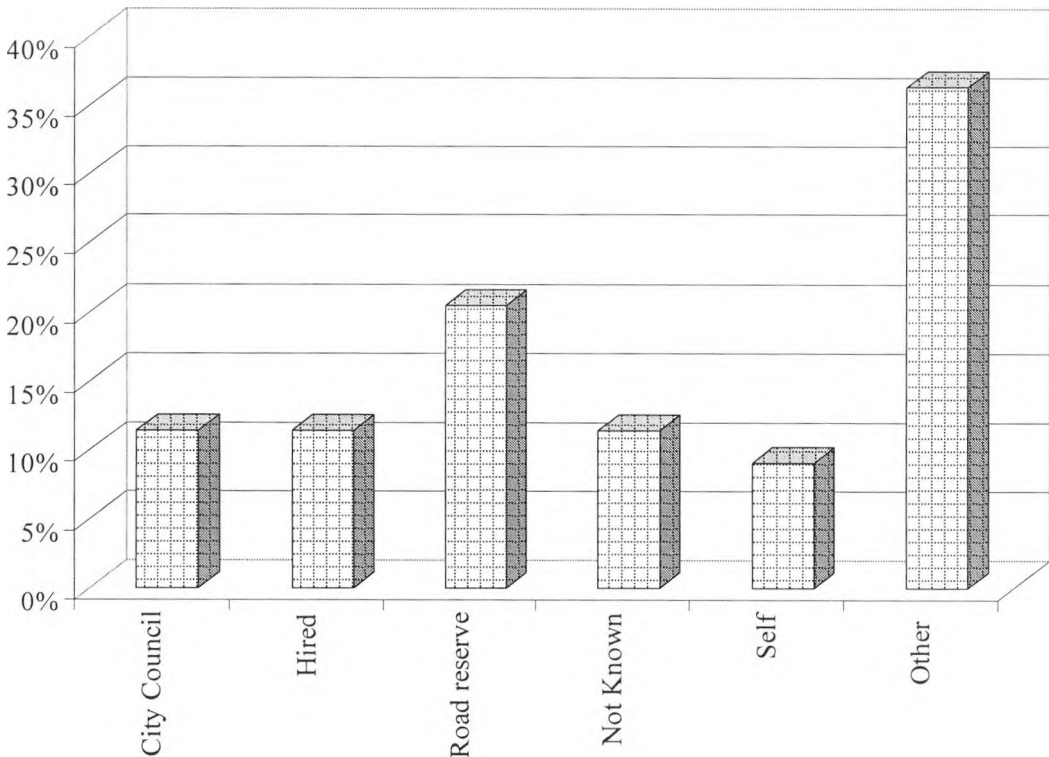
On the length of time the respondents had been involved in farming, none of the respondents had farmed for less than one year, while 30% of them had farmed for between 1-2 years. Of all the respondents 57% had farmed for over five years, and only 14% had farmed for between 2-5 years.

4.1.8 Ownership of Land being cultivated

Table 1.7: Ownership of Land being cultivated

	Frequency	Percent
City Council	5	11%
Hired	5	11%
Road reserve	9	20%
Not Known	5	11%
Self	4	9%
Other	16	36%
	44	100%

Fig 1.7: Ownership of Land being cultivated



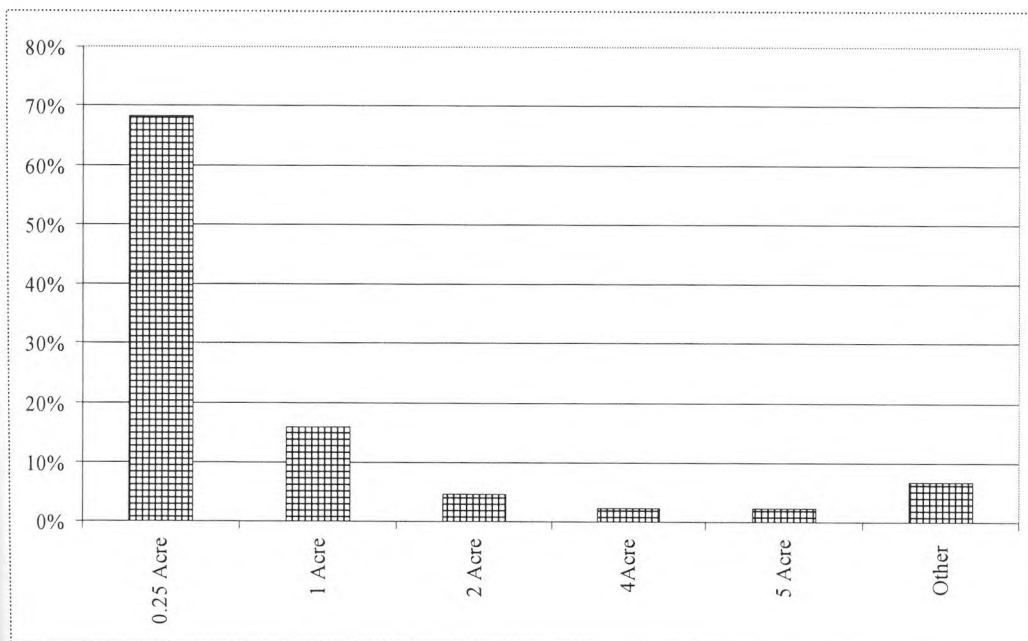
On ownership of land that is being cultivated, 36% of the respondents indicated that the farm they were cultivating was not within the classification provided for in the questionnaire, and thus was cited as other, while 20% of the respondents indicated that the portion of land they cultivated was a road reserve. Those that farmed on city council and hired land were 11% each. Those that did not know the owner of the land or owned the farms were 11% and 9% respectively.

4.1.9 Size of Land being cultivated

Table 1.8: Size of Land being cultivated

Land size	Frequency	Percent
0.25 Acre	30	68%
1 Acre	7	16%
2 Acre	2	5%
4Acre	1	2%
5 Acre	1	2%
Other	3	7%
	44	100%

Fig 1.8: Size of Land being cultivated



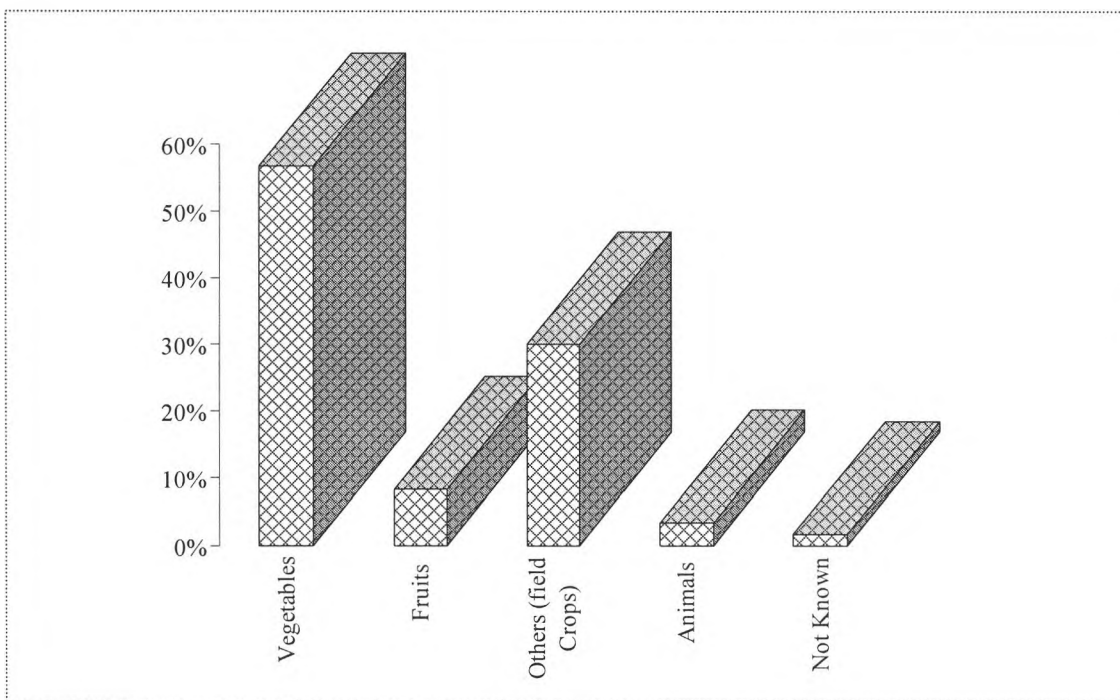
On the size of the land being cultivated, majority (68%) of the respondents were cultivation on $\frac{1}{4}$ of an acre, while 16%, 5% and 2% cultivated on 1 acre, 2 acre and 4 acres.

4.1.10 Crops Grown

Table 1.9: Crops Grown

	Frequency	Percent
Vegetables	34	57%
Fruits	5	8%
Others (field Crops)	18	30%
Animals	2	3%
Not Known	1	2%
	60	100%

Fig 1.9: Crops Grown



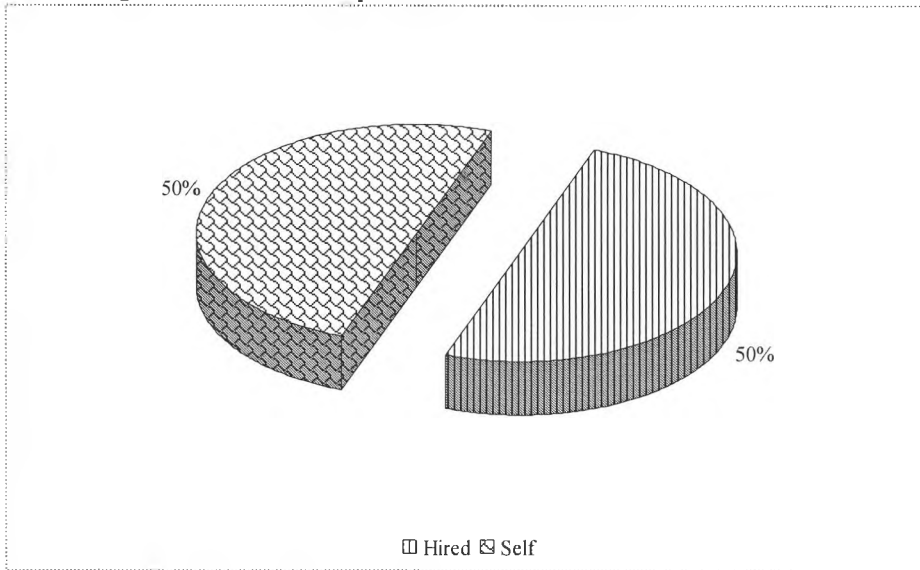
On the question of the type of crops grown, 57% of the respondents indicated that they cultivated vegetables, while 30% indicated that they cultivated field crops, and 8% were cultivating fruits. A small number (3%) of the respondents were engaged in animal production while 2% did not indicate what they produced.

4.1.11 Sources of Labour

Table 1.10: Number of dependants

	Frequency	Percent
Hired	24	50%
Self	24	50%
	48	100%

fig 1.10: number of dependants



On the question of the sources of land for the farming activities 50% of the respondents indicated that they hired while another 50% indicated that did the work themselves.

4.1.12 irrigation and Source of Irrigation Water during the Dry season

Table 1.11: Source of irrigation water

	Frequency	Percent
City Council	5	11%
Swamp/Well/Spring	17	39%
Rain water	16	36%
Sewerage	5	11%
Dam	1	2%
	44	100%

On the question of whether the respondents irrigated their crops during the dry season, 64% of the respondents indicated that they irrigated they crops while 36% of the respondents indicated that they never. On the question of the sources of irrigation water 39% of the respondents indicated that they used water from either a well, a spring or a

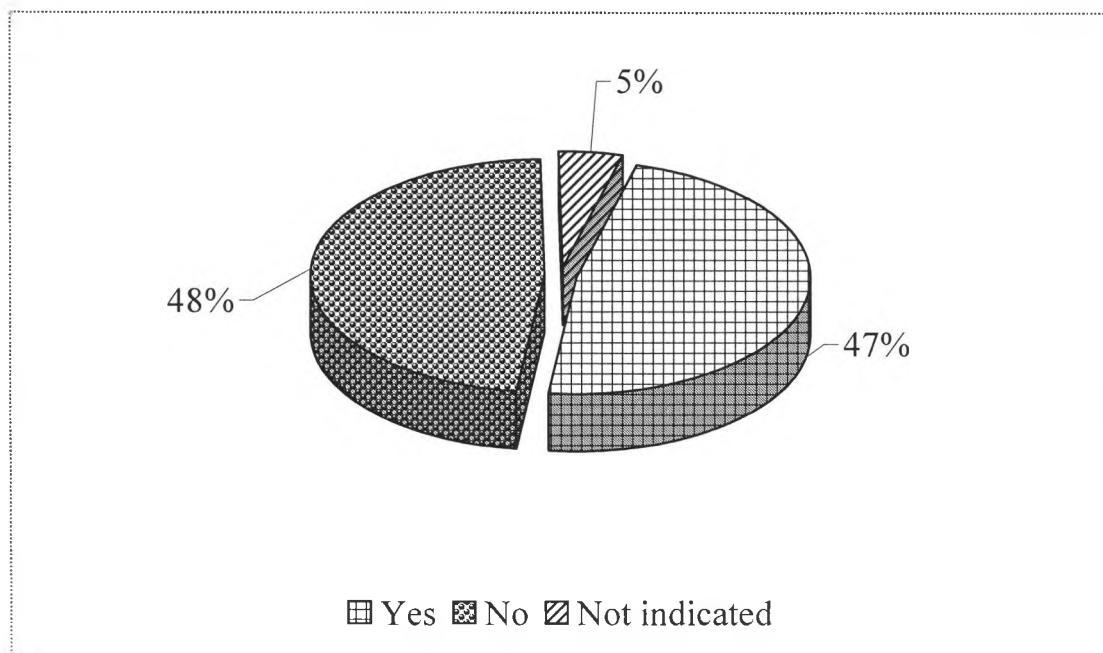
swamp. Another 36% of the respondents indicated that they used stored rainwater, while 11% of the respondents indicated that they used sewerage, only a very small number (2%) used water from the dams.

4.1.13 Agricultural extension Services

Table. 1.12: agricultural extension services

Opinion	Frequency	Percent
Yes	21	47.7%
No	21	47.7%
Not indicated	2	4.5%
	44	100.0%

Fig. 1.11: agricultural extension services



On the question whether the respondents received agricultural extension services, 47.7% of the respondents indicated that they received while a similar number (47.7%) indicated that they did not receive. A very small number (4.5%) did not indicate whether they received or never.

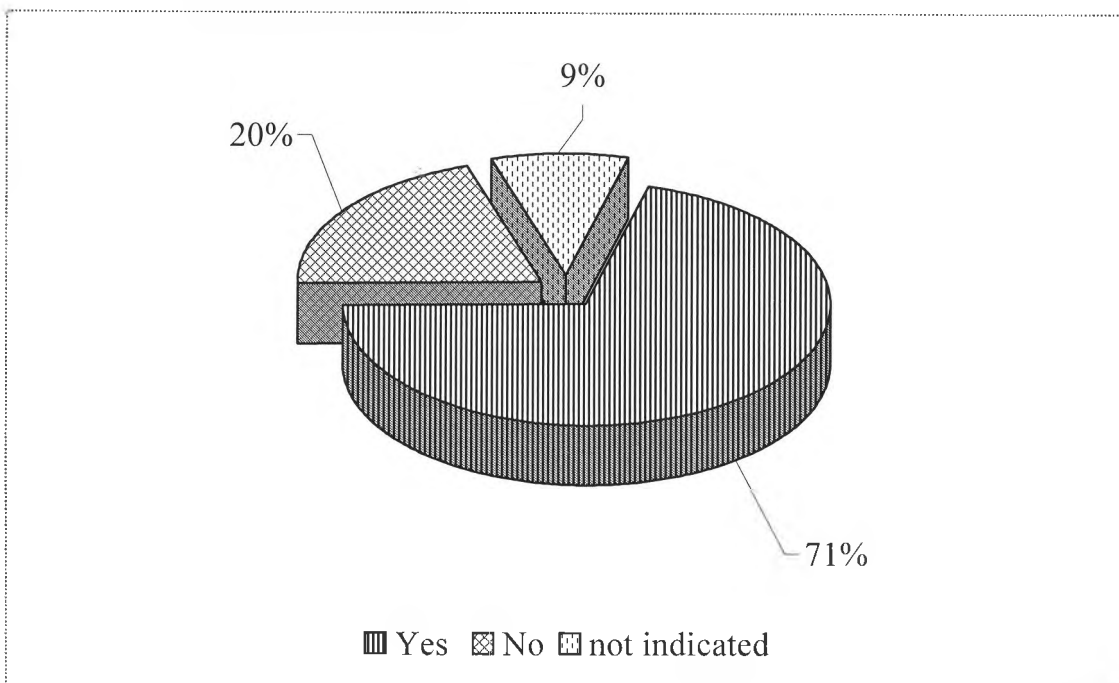
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4.1.14 Usage of pesticides

Table 1.13: usage of pesticides

	Frequency	Percent
Yes	31	70%
No	9	20%
not indicated	4	9%
	44	100%

Figure 1.12: usage of pesticides



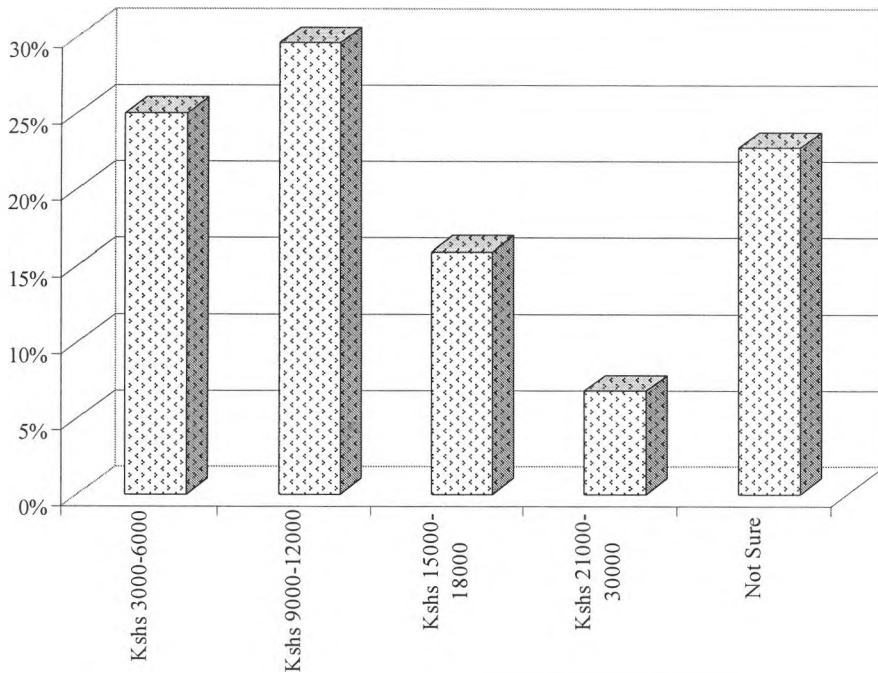
On the question whether the respondents used pesticides, 70% indicated that they did while 20% indicated that they did not use, a small number did not indicate whether they used or never used.

4.1.15 Amount of income earned from farming

Table 1.14: Income earned from farming

Amount Earned	Frequency	Percent
KSHs 3000-6000	11	25%
KSHs 9000-12000	13	30%
KSHs 15000-18000	7	16%
KSHs 21000-30000	3	7%
Not Sure	10	23%
	44	100%

Fig. 1.13: Income earned from urban farming



Regarding the amount of income earned per month from the farming activities, the income brackets were categorized into four segments. Of the segment set, 25% of the respondents earned between KSHs 3000-6000, while 30% earned 9000-12000, and 16% earned 15000-18000, only 7% earned 21000-30000. Of all the respondents 23% were not sure of how much they earned and no reason were given for their inability to know.

4.2 Qualitative analysis

4.2.1 Challenges Faced During farming

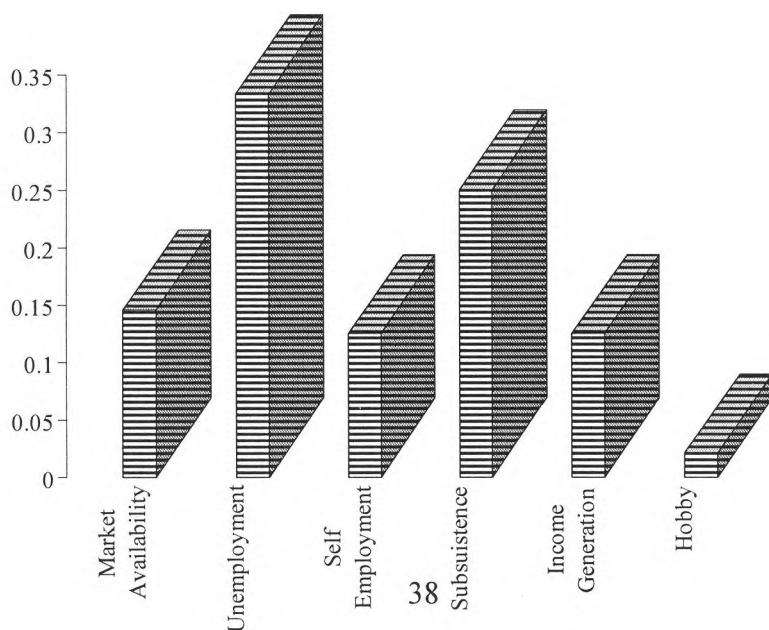
On the challenges faced during farming, majority of the respondents indicated that water source (21%) and insecurity (21%) were the most common faced challenges. Also High cost of fertilizers 9% and unavailability of certified seeds 9%. Another group of respondents cited inadequate Land 4%, while other cited lack agricultural extension services, 6%. Another group cited grazing by pastoralist (4%) while others still cited financial constrains (3%). Pests/Diseases accounted for 13%, while land grabbers (1%), marketing Challenges accounted for 6%, and labour for only 3%

4.2.2 Reasons for Farming Engagement

Table 1.15: reasons for farming

Reason	Frequency	Percent
Market Availability	7	15%
Unemployment	16	33%
Self Employment	6	13%
Subsistence	12	25%
Income Generation	6	13%
Hobby	1	2%
	48	100%

Fig. 1.14: reasons for farming



On the reason why respondents were engaging in farming, Market Availability was cited by 15% while unemployment was cited by 33% of the respondents. Another 13% of the respondents indicated that they engaged in farming for subsistence purposes, while 13% of them indicated that they were interested in income generation. Only a mere 2% indicated that they were farming as a hobby.

4.2.3 Improving sustainability of farming activities in the City

On the Improving sustainability of farming activities in the City Regulation of input costs was cited as important with 13% of the respondents indicating that it was important to them, while 5% indicated that improved prices of the produce would help in improving sustainability of urban farming. Another 13% and 34% cited financing and provision of extension Services. Further security improvement was cited by 2% of the respondents as an important factor in improving the sustainability of urban farming, while water supply improvement was cited by 13%. Government Support was also cited as important with 10%, while 2% cited increased farmers Efforts and land registration and market development cited by 5% each.

4.3 Discussion of results

The study established that there were more men (53%) than women (47%) engaged in farming activities within the city. Further the age bracket actively involved in urban farming above 26 years (91%), of whom 71% had farmed for more than two years. The study also established that majority of the farmers (82%) were married, and most had attained primary and secondary education (88%). The ethnic background of the farmers was from either Kikuyu or Luhya communities accounted for 72% of all the farmers. The study also established that the average number of dependants per farmers is (4)

dependants. Further the crops that are frequently grown were field crops and vegetables accounting for more than 87% for all the farmers. The size of land cultivated averaged (1.4 acres). The study established that the farmers used either hired or own labour on equal basis. The study further established most of the farmers irrigated their land, with 64% irrigating their crops, while the source of water frequently used was from a well (39%) and a small number used sewerage water. From the study majority (45%) of the farmers earns between KSHs 3,000 -12,000, though some (23%) of the farmers were doing farming for food supply only. The study established that urban farmers faced myriad of challenges ranging from water source (21%) and insecurity (21%), high cost of fertilizers 9% and unavailability of certified seeds 9%. inadequate Land 4%, lack agricultural extension services, 6%, grazing by pastoralist (4%) and financial constraints (3%). Pests/Diseases are also a challenge to 13% of the farmers, and land grabbers (1%), marketing Challenges 6%, while labour is a challenge for only 3% of the farmers.

Finally the study established that to make urban farming more sustainable, there is need for Regulation of input costs (13%), improved prices of the produce (5%) while 13% and 34% says financing and provision of extension Services in the respective order would help. Security improvement is also an important component (2%), water supply improvement (13%), government support, market development (2%), increased farmers efforts and land registration and last not the least market development (5%).

4.4 Summary of the findings

On the gender of the respondents 53% were male while 47% were female while on the age of the respondents none were below 15 years, 9% of the respondents were aged between 16-25 years. Majority of the respondents (49%) were aged between 26-35 years. Another significant number (42%) of the respondents was aged above 45 years.

While on the ethnic background of the respondents, the Kikuyu and the Luhya community accounted for 36% each, while Kisii and Luo accounted for 11% and 7% in that respective order. The Kamba and Rendille communities accounted for 9% and 2% respectively.

On the marital status of the respondents, the married persons were the majority accounting for 82%, while singles and Windowed accounted for 11% and 7% respectively. None of the respondents was either divorced or separated. While as on the level of education, those that had no education at all accounted for 4% of the respondents, while those that had attained primary and secondary level of education accounted for 44% each. Only 4% of the respondents had attained tertiary level of education, while none had attained the university level of education. A small group (2%) did not indicate their level of education and on the occupation of the respondents rather than farming, majority (81%) indicated that they were only involved in farming, while 7% were watchmen. Only 5% and 2% of the respondents indicated that they were either business persons or housewives. A number (5%) of the respondents were not categorized in any way.

Regarding the number of dependants that the respondents take care of, majority (27%) did not indicate the number of dependants under their care. Another 25% indicated that they took care of 4 dependants. Those that had two, seven and ten accounted for 5% each, while those that had three and six dependants accounted for 9% each. Those that had eight dependants accounted for 7% only. While On the length of time the respondents had been involved in farming, none of the respondents had farmed for less than one year, while 30% of them had farmed for between 1-2 years. Of all the respondents 57% had farmed for over five years, and only 14% had farmed for between 2-5 years.

Regarding ownership of land being cultivated, 36% of the respondents, indicated that the farm they were cultivating was not within the classification provided for in the questionnaire, and thus was cited as other, while 20% of the respondents indicated that the portion of land they cultivated was a road reserve. Those that farmed on city council and hired land were 11% each. Those that did not know the owner of the land or owned the farms were 11% and 9% respectively. As of the size of the land being cultivated, majority (68%) of the respondents were cultivation on $\frac{1}{4}$ of an acre, while 16%, 5% and 2% cultivated on 1 acre, 2 acre and 4 acres.

On the question of the type of crops grown, 57% of the respondents indicated that they cultivated vegetables, while 30% indicated that they cultivated field crops, and 8% were cultivating fruits. A small number (3%) of the respondents were engaged in animal production while 2% did not indicate what they produced. And as on the question of the sources of land for the farming activities 50% of the respondents indicated that they hired while another 50% indicated that did the work themselves. Further on the question of whether the respondents irrigated their crops during the dry season, 64% of the respondents indicated that they irrigated they crops while 36% of the respondents indicated that they never. On the question of the sources of irrigation water 39% of the respondents indicated that they used water from either a well, a spring or a swamp. Another 36% of the respondents indicated that they used stored rainwater, while 11% of the respondents indicated that they used sewerage, only a very small number (2%) used water from the dams. And as on the question whether the respondents received agricultural extension services, 47.7% of the respondents indicated that they received while a similar number (47.7%) indicated that they did not receive. A very small number

(4.5%) did not indicate whether they received or never. And as whether the respondents used pesticides, 70% indicated that they did while 20% indicated that they did not use, a small number did not indicate whether they used or never used.

Regarding the amount of income earned per month from the farming activities, the income brackets were categorized into four segments. Of the segment set, 25% of the respondents earned between KSHs 3000-6000, while 30% earned 9000-12000, and 16% earned 15000-18000, only 7% earned 21000-30000. Of all the respondents 23% were not sure of how much they earned and no reason were given for their inability to know.

On the challenges faced during farming, majority of the respondents indicated that water source (21%) and insecurity (21%) were the most common faced challenges. Also High cost of fertilizers 9% and unavailability of certified seeds 9%. Another group of respondents cited inadequate Land 4%, while other cited lack agricultural extension services, 6%. Another group cited grazing by pastoralist (4%) while others still cited financial constrains (3%). Pests/Diseases accounted for 13%, while land grabbers (1%), marketing Challenges accounted for 6%, and labour for only 3% respectively. On the reason why respondents were engaging in farming, Market Availability was cited by 15% while unemployment was cited by 33% of the respondents. Another 13% of the respondents indicated that they engaged in farming for subsistence purposes, while 13% of them indicated that they were interested in income generation. Only a mere 2% indicated that they were farming as a hobby.

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CHAPTER FIVE

5.0 Conclusions and Recommendations

5.1 Introduction

In this chapter, the researcher avails the findings and conclusions from the study. The chapter also avails the recommendations in relation to the objectives of study; besides making suggestions on areas that the researcher feels require further research.

5.2 Conclusions

The study established that there were more men than women that were involved in urban farming. Further, since most of them were married and engaged in farming for livelihood, the gender roles were clearly evident from the study results.

The study concludes that most of the farmers in Nairobi do not own land on which they are conducting their farming activities. They are also doing their farming activities on small plots of land, which mostly measured $\frac{1}{4}$ of an acre. Further the study concludes that there is contaminated food which has been irrigated using raw sewerage. Additionally most farmers identified lack of extension services as a foremost challenge, and would like these services to be offered to them so that they can improve their production. Further the cost of input and irrigation water is a challenge in urban farming.

The study also established that majority of the farmers have been in farming for a long time with most of them having farmed for more than three years. The main reason for engaging in farming is income generation, for supporting their families since quite a number of them are supporting a number of dependants. Unemployment within the

economy has driven many of the individual to farming; however it is not clear whether they would abandon farming in case employment opportunities arose.

5.3 Recommendations

1. There is need to find out how much of the food that is supplied to the market has been contaminated through use of unclean water like raw sewerage.
2. The government and other agri-business management information agencies need to intensify extension services provision as such to provide technical and management information on marketing, production and value addition.
3. The city authorities needs to create a system of purifying effluence from either industrial wastes, sewerage among other wastes, and recycle the same water for irrigation of urban farms. This will ensure that the farmers are not using raw sewerage as is the case with some farmers.

5.4 Areas for Further Research

1. Health risks associated with food from urban farms
2. Importance of effluence as source of water for irrigation
3. Gender contribution in urban farming
4. The function of city/municipal authorities in regulating and promoting urban farming.

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QUESTIONNAIRE

Dear respondent,

I am a student from the University of Nairobi.

The purpose of this questionnaire is to aid in data collection for a research project to be submitted to the University of Nairobi for academic fulfillment. All information from respondents will be treated with confidence and will only be used for this academic exercise.

Please answer the following questions according to the given instructions.

Please tick where appropriate.

Back ground information

- 1.) Sex M F
- 2.) Place of Birth _____
- 3) Age
 - a) Below 15
 - b) Btw 16-25
 - c) Btw 26-35
 - d) Over 45
- 4.) Ethnic back ground _____
- 5) Current Estate of resident in Nairobi _____
- 6.) Marital status
 - A) Single
 - b) Married
 - c) Widowed
 - d) Divorced
 - e) Separated
- 7.) Level of Education
 - A) None
 - B) Primary
 - C) Secondary
 - D) Tertiary

E) University

7) Occupation _____

9) Number of dependants _____

Urban Farming questions

1). How long have you been farming?

A less than 1 year

B 1 to 2 years

C 2 to 5 Years

D More than 5 years

2) Do you own the land on which you are farming?

A Yes

B No

3) If no who is the owner of the land?

A City Council

B Hired

C Road Reserve

D Not Known

E Self

4) How big is your farming area? _____

5) What crops do you grow?

A Vegetables

B Flowers

C Fruits

D Others (Specify) _____

6) What amount of produce do you harvest from your farm?

7) Where do you get your labour from? _____

8) Do you irrigate your crops during the dry season?

A Yes

No

9) If yes please state the source of your irrigation water? _____

10) Do you receive any agricultural extension services?

Yes

No

11) Do you use pesticides? Fertilizers, agrochemicals, certified seeds etc

Yes

No

12) Are you able to get enough produce for food for your family?

13) How can you assess your profitability?

Profitable

Not profitable

14) Do the local government authorities harass you?

Yes

No

15) Do you have any surplus production and where do you sell it? _____

16) What other problems/challenges are you facing in the farming you do?

17) Why are you involved in farming in the city?

18) Can suggest ways of making it sustainable _____

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