WOMEN AND URBAN AGRICULTURE: A CASE STUDY OF NAIROBI, KENYA

BY

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DECLARATION

This thesis is my original work and has not been presented for an academic award in any other university.

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This thesis has been submitted for examination with our approval as the university supervisors.

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DEDICATION

To my parents, Benson Kawai Mukuthi and Rhoda Kanyiva Maundu, for encouraging and supporting me to get this far.

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Kawai, David.

ABSTRACT

This study focused on women urban cultivators in the city of Nairobi. It had the objective of investigating the motivational factors to women's involvement in urban agriculture.

The specific objectives of the study included: Investigating the factors that explain the involvement of women in urban agriculture; investigating the factors influencing the location of gardens in certain areas of the city; finding out the extend to which women have control over the use of food and income from their urban garden; and establishing the key problems that women experience as urban cultivators.

The study employed a combination of both qualitative and quantitative techniques. Qualitative techniques used included informal interviews and observation. Quantitative techniques included use of questionnaires or interview schedules. Data processing and analysis procedures were quantitatively and qualitatively applied.

The literature reviewed shows that urban agriculture is a phenomenon evident in many cities and major towns of developing countries. This is contrary to the fact that urban areas in these countries have not been designed to accommodate farming at any scale. Largely it is an activity undertaken by the unemployed and the low-income urban residents as a source of food, income or as a hobby. Thus, urban agriculture is important in the sense that it reduces the risk of starvation or malnutrition and contributes to household food security among low-income urban residents. It also has a recreational value (hobby) and helps to supplement household incomes.

Specifically, in the city of Nairobi urban agriculture is illegal since it is said to encourage breeding of mosquitoes while tall crops such as maize act as hiding places for thugs. The practitioners use rented, borrowed or illegally occupied land signifying that they have no land of their own and thus face the problem of low security of land tenure.

Despite the illegal status of the practice, there is a proliferation of gardens in the city of Nairobi along the city's polluted streams, drainage and sewerage systems, roads, rail lines, on vacant industrial and housing plots, at house back yards and on other unused public and private spaces.

The study was guided by the following two theories: The situational approach theory and the cultural lag theory. The core argument of the situational approach theory is the idea of a crisis, definition of the situation and the concept of social disorganization, which brings about redefinition of the situation. In essence, urban economic realities constitute a "crisis" resulting from escalating costs of basic necessities, low wages and pressure to meet subsistence needs. It is this crisis that calls for a response or redefinition of the situation. As a result, women indulge in urban cultivation in response to this crisis.

Although the situational approach theory views human behaviour as adjustable, the argument of the cultural lag theory is that this adjustment is not necessarily harmonious. There is a tendency for old forms of behaviour to persist. The central focus of the cultural lag theory is the occurrence of change at unequal time. In this study the argument is that when people migrate from the rural area to the city, they are forced to adjust their way of life to be able to fit in the urban environment. However, the adjustment is not uniform as far as their socio-cultural and economic activities are concerned. They may find it easier to drop some of their socio-cultural traits than it is to wholly abandon important rural economic activities such as farming. This theory helps to explain the interaction between ones socio-cultural back ground and her involvement in urban agriculture.

The study found out that relatively middle-aged women who are married and have children dominate urban cultivation. Most of these women are either unemployed or underemployed and their spouses are in the low income-earning group. Majority of them are also lowly educated. Their desire to farm in the city is driven by the need to supplement household food supply and income. Clearly, it was established that the socio-

economic status factors of occupation, income and the level of education are key factors in explaining women's involvement in urban agriculture.

It was noted that majority of the women urban cultivators combined garden work with other forms of employment. This led to the conclusion that urban cultivation is not an only survival strategy for women but a way of supplementing household food supply and income.

Given the scarcity of vacant land in the city of Nairobi, the study established that the overriding factor in establishing gardens in certain areas of the city is the availability of such 'idle' land. Thus, the need to have a piece of land to cultivate surpasses the suitability of such land for agricultural purposes. In addition, the study found out that majority of the women farm on such land after entering into an informal agreement with a second party.

Women have traditionally been the principal cultivators in rural Kenya. However, they have been excluded almost entirely from the land entitlement process and thus decisions on use of such land and appropriation of benefits accruing from it lie with the male heads. With the changes occurring in the society giving women a higher status and increasing their say in certain and indeed most matters affecting society, this study established that women urban cultivators make decisions pertaining to the search of a garden, choice of crops to be grown, the use of garden produce and appropriation of any income from the sale of garden produce.

The study identified several problems that women face in their endeavor to produce food in the open and idle spaces in the city. These include: theft and destruction of crops by people and animals, lack of capital, inadequate time to do farm work, lack of water for irrigation crop pests and diseases, and lack of enough space to farm. These are common problems to farmers even in the countryside. The only problem unique to urban farmers is theft and destruction by people and animals. This is however a common problem affecting urban farmers in general and not specific to women farmers.

Further it has been established that urban farming (which is largely illegal) receives very minimal attention from the government and the ministry of agriculture. As a result majority of the women cultivators do not receive any agricultural extension services. This lack of services from the ministry of agriculture indicates that the potential of urban agriculture is unappreciated and largely untapped.

This study therefore recommends that the government should legalize urban cultivation, avail credit services to women urban farmers and provide the necessary agricultural extension services through the ministry of agriculture. A favorable legislation towards urban agriculture will enable planners and farmers to design and plan a nutritionally self-reliant city.

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LIST OF ACRONYMS

A.I.D:	Agency for International Development
AMREF:	African Medical and Research Foundation
ANP:	Applied Nutrition Project
BKM:	Bidii Kwa Maendeleo
CBD:	Central Business District
FAO:	Food and Agriculture Organisation
GDP:	Gross Domestic Product
ILO:	International Labour Organization
IMF:	International Monitory Fund
NCC:	Nairobi City Council »
NGO:	Non-Governmental Organization
SAPs:	Structural Adjustment Programmes
SOMIRENEC:	Social Ministry and Research Network Centre
SPSS:	Statistical Package for Social Scientists

CHAPTER ONE

STATEMENT OF THE PROBLEM

1.1 Background of the Problem

A major challenge facing government planners in most Third World countries is to guide the economy so that it creates employment and provides for the basic needs such as food, shelter and clothing to a rapidly growing population. Population pressure in rural areas, poverty and high aspirations for a better life have triggered a wave of rural-urban migration (Kaberere, 1987). With limited employment opportunities in the urban areas, the result has been mass unemployment. Quite a considerable number of those unemployed have reverted to the informal sector since the formal sector, with its low rate of employment creation cannot accommodate them.

The informal sector activities have been described by the Central Bureau of Statistics (1986) and the I.L.O. - World Employment Programme - Kenya Mission (1972) as characterised by the following criteria:

> *... Ease of entry; reliance on indigenous resources, family ownership of enterprises; small-scale operation; labour intensive and adaptive technology; skills acquired outside the formal school system; and unregulated and competitive markets.*
> (Mani, 1960:1).

These activities range from shoe shinning, maize roasting, cart pulling and car washing to the petty commodity production by artisans making jikos, handicrafts and clothes. Undoubtedly, the above definition ignores urban agriculture, which on close scrutiny has the characteristics of the informal sector. Gutman (1986) argues that urban gardening is an activity that requires few resources and its costs are low since one can make use of materials that are readily available to the household.

Maxwell and Zziwa (1990) purport that urban agriculture is a means of survival for many households, makes significant contribution towards food reliance for African cities, and is one of the productive informal sectors (see also O'Connor, 1983).

Most probably, the reason why urban agriculture has been neglected for long could be due to the fact that government authorities have considered it as an economically marginal activity. Practitioners of urban agriculture see it as a normal way of living. There is, however, lack of project intervention by development agencies geared towards promoting urban agriculture. Like many other informal sector activities, urban agriculture could then be seen as a local/indigenous response to a set of harsh economic conditions, which exist in Kenya as in many Third World Countries.

The National Survey on urban agriculture carried out by Mazingira Institute in 1985 brought the subject of urban agriculture into limelight. This study showed that urban agriculture contributes considerably to the growth of Kenya's G.D.P. with sales from urban agricultural produce amounting to Ksh.60.9 million at the time of the survey (Lee-Smith and Lamba, 1991). Other studies that followed also showed that urban agriculture is increasingly becoming an important survival strategy for the majority of the low-income urban population (Dennery, 1995; Lamba, 1992; Mwangi, 1995). Much of the produce from urban farms is consumed at household level (Mougeot, 1994). Urban agriculture could thus be looked at as the subsistence sector for the low-income urban community.

According to F.A.O. (1996), urban agriculture has emerged as a response to worsening **food** trends in most Third World cities.

It could be seen as an adaptive mechanism of the low-income urban dwellers to cope with the escalating cost of living in cities both as a source of food and income. Memon and Lee-Smith (1993:34) assert that, while all income groups practise urban farming, the incidence is highest among the low-income people.

Despite the crucial role that urban agriculture plays, it has only received peripheral attention by researchers, government and city authorities. Studies done on the subject have either focused on the food and employment/income aspect (Mwangi, 1995; Lee-Smith et al, 1987) or on factors affecting the decisions and actions of urban farmers (Dennery, 1995). The rest have generally addressed the subject with a view to explore and ascertain the extent of the practice (Rakodi, 1988; Freeman, 1991). Regarding labour in urban farms, the Mazingira survey»of 1985 shows that most of the labour is provided by women (62% in Nairobi). This finding supports the view that women are active participants in agriculture especially in Third World Countries (see Wagner, 1949; Boserup, 1970; Palmer, 1975; Andah, 1978). Women are the majority of the small-scale farmers and dominate farm work in developing countries. Specifically, Dixion, 1983(quoted in Fortmann and Rocheleau, 1985:254) notes that women comprise from 17.5% (in Central and South America) to 46.2% (in Sub-Saharan Africa) of the agriculture labour force. In specific countries, Andah (1978) points out that 47% of the food farmers in Ghana are women and in Liberia 42% of women provide family labour in agriculture. These findings denote that women in the Third World Countries are important actors in agricultural development.

The participation of women in urban agriculture is, however, scantly addressed (F.A.O. 1996). In Kenya, there is no detailed study giving explanation as to why women indulge in urban agriculture and the problems they encounter as a 'special category of the low income group' (Freeman, 1993).

1.2 Problem Statement

Urban agriculture is an activity performed by the relatively 'poor' city dwellers whose major intention is to provide food for their families (FAO, 1996) and earn an income (Mwangi, 1995).

A casual survey of the City of Nairobi on food production and supply is bound to culminate to the conclusion that there is a proliferation of small farms in the city along streams, drainage and sewerage systems, rail lines, roads, on vacant industrial and housing plots, at house backyards and on other unused public and private spaces.

These farms are mostly owned by the low income urban dwellers (Freeman, 1991; Lee-Smith et al, 1987; Dennery, 1995; Mwangi, 1995). However, studies do not treat women as a special category of the low-income residents who have been culturally and economically disadvantaged. As Freeman (1993:20) puts it:

> Women are a group that has been locked out of the better paying wage jobs in the city;... Has been out-manoeuvred by men in competition for other informal sector occupations and hence growing and selling food from urban lands comprise one activity in which women can gain a measure of control over their lives.

Considering the abject scarcity of information regarding the participation of women in urban agriculture, this study is an attempt to explore the factors that explain women's

involvement in urban agriculture. Further, the study documents the specific factors that influence the location of urban farms in certain areas of the city. In addition, it explores the extent to which women have control over the income (and food) from their urban farms. This is one way of ascertaining whether or not farming in the city gives women any control over the fruits of their labour. Finally, this study explores the key problems that women face as urban cultivators. More precisely, the study has been guided by the following questions:

1. What factors explain the involvement of women in urban agriculture in the City ofNairobi?
2. What factors influence the location of urban farms on certain areas of the City ofNairobi?
3. To what extent do women have contfol over the income/food from their farms in the urban areas?
4. What key problems do women face as urban farmers?

1.3 Justification of the Study

After independence, the Government of Kenya highly discouraged the informal business undertakings. As a result Nairobi City Council (NCC) personnel demolished the shelters of informal businesses in Nairobi forcing the entrepreneurs to conduct their trade in open air (Jua Kali). Since 1972 the government has, however, recognised the role of the informal sector in employment creation (ILO, 1972; Kaberere, 1987). Despite this recognition, not all activities of this sector are appreciated by the government and city authorities. Majority are still rendered illegal and among them is urban agriculture, which has emerged as an informal enterprise to serve the needs of the

low-income urban dwellers (A.I.D., 1976). Urban agriculture is, however, a subject that has not been adequately researched on and thus warrants attention.

The few studies that have been conducted in the City of Nairobi regarding urban agriculture have either focused on its contribution to food security (Mwangi, 1995; Lee-Smith et al, 1987) or on matters of decision making as far as urban farming is concerned (Dennery, 1995). The rest have served to highlight the phenomenon generally either by describing it, its location and economic worth (Freeman, 1991; Obara, 1988). There is thus no study on the motivational factors to women's involvement in urban agriculture 'even though women are known to be active participants in agriculture in Kenya' (Masinde, 1991; Wagner, 1949).

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The focus on women in this study is necessitated by the fact that meaningful development cannot ignore the economic potential and needs of more than half of the population. As Jackson (1985) puts it, development planners who fail to appreciate the role of women end up focusing on an incomplete picture of the society to be served and drawn into participation.

In Kenya, the government and other aid agencies emphasise the role of women in economic development. This justifies the need for both an extensive and incisive research on the subject of women's economic activities. Much of the research on this issue has been in the rural areas (Masasabi, 1987). However, with the burgeoning women population in urban areas, it is crucial that their economic undertakings and participation in the urban economy be brought into perspective.

1.4 Objectives of the Study

The general objective of this study was to investigate the motivational factors to women's involvement in urban agriculture. The specific objectives were:

1. To find out the key factors that explain the involvement of women in urban agriculture.
2. To investigate the factors influencing the location of farms in certain areas of the City of Nairobi.
3. To find out the extent to which women have control over the income/food from their farms in the urban areas.
4. To understand the key problems that women face as urban farmers.

CHAPTER TWO

LITERATURE REVIEW AND THEORY

2.1 Overview of Urban Agriculture in Some Third World Cities

Urban areas in colonial and post colonial Kenya have never been designed to accommodate farming at any scale of operation. As Mvena et al (1991) put it, "The land that is within urban areas is customarily zoned out to accommodate residential areas, central business districts (CBDs), industrial areas, roads and railway construction, recreational facilities etc." Land that is not utilised for these purposes is by and large supposed to be left out for aesthetic purposes or simply for urban planning.

Contrary to the above assertion, the practice of urban agriculture is evident in many cities and other major towns of developing countries. In East Africa, several recent studies show that the low-income urban population, which is faced with the problem of surviving in towns, has reverted to urban agriculture (Freeman, 1991; Lee-Smith et al, 1987; Mwangi, 1995; Maxwell and Zziwa, 1990; Mvena et al, 1991).

Elsewhere in the developing countries, researchers point out that urban agriculture is a source of food and employment among the low-income urban residents. In Metro-Manila, for example, throughout 1981, city residents produced 80% of their food requirements (Yeung, 1985). In Nigeria, 13% and 30% of the residents of Kano and Kaduna cities respectively supplemented their wage income by agricultural work in the cities in the 1980s (Andrae, 1992). In Lusaka, Zambia, 50% of the urban squatter residents were found to have home and distant gardens (Wade, 1986).

In Dar-es-Salaam, Tanzania, 44% of the low-income earners had farms in 1980, which increased to 70% in 1987 (Mougeot, 1993). Generally, 20-80% of the household food consumption in African cities is produced through urban farming (Mougeot, 1994).

The above figures show that urban agriculture is extensively practised in Third World cities. It could thus be asserted that the desire to meet subsistence needs is a driving force behind urban agriculture. Considering that majority of the women in urban areas are unemployed and customarily charged with the responsibility of taking care of children and providing for their families (Masinde, 1991), then they are forced to look for alternative means of income and food. However, the desire to meet subsistence needs is not enough reason why women indulge in urban agriculture since the "rich" also indulge in urban farming. It is thus within the confines of this study to verify this contradiction.

2.1.1 Rationale for and the Importance of Urban Agriculture

From an economic point of view, urbanisation has been viewed as a process in which the individual moves from an agricultural community to a non-agricultural one, preferably an urban area (Adejuwon, 1979). Sociologically, it could be seen as a process leading to the evolution of communities in which the bonds of kinship, neighbourliness and sentiments arising out of living together for generations under common folk tradition diminish or become relatively weak. These assertions resonate Wirth (1938) and Gugler (1981) that after the individual moves into the city, he/she adopts an [4t]urban way of life" different from that of the rural folk.

In most Third World Countries, the process of urbanization seems to defy the above arguments. This is because, agriculture, earlier seen as a predominantly rural activity has infiltrated into the city. Thus there is need to place agriculture in the process of urbanisation.

Most rural-urban migrants come to the city for a purpose and hence are target workers. They have the hopes of retiring to their rural homes and as a result they maintain links with their rural kinsmen. In a way, they could be termed as pseudo-urban dwellers or natives in town who are peasants at heart. Gugler (1981:118) puts it that:

> The commitment many migrants have to their community of origin may be taken to suggest that they remain peasants at heart, that they do not become urbanites.

Thus the activities of the urban dweller in the Third World countries have remnants of rural economic undertakings of which agriculture is one.

Urban agriculture could then be seen as part of the ruralisation of the city, and more so, a refutation of the contention by Redfield (1941) of rural urban continuum where some societies could be classified as 'purely' rural and others 'purely' urban. It could also be seen as part of urban ethnicity - an aspect of rural way of life carried over to the city by migrants. Naipul (1981) [Quoted in Maxwell & Zziwa, 1990:4] asserts that agricultural production in African cities is a kind of hobby, something that reminds its practitioners of their rural roots

The rate of urbanization in the Third World countries is by far higher than the rate of "idustrial development resulting in what Sovani (1969:322) calls "over-urbanisation".

Urban realities are such that the majority of men are not in a position to become the sole providers for their dependants. Women are then forced to be innovative and look for ways to supplement their husband's income. Nelson (1978) asserts that women have entered the informal sector with the motive of contributing to the upkeep of their families (see also Hellmann, 1984).

Whether or not there is a traditional/cultural obligation for women's productive role, present economic hardships, especially in urban areas force women to accept this responsibility.

Different scholars have variedly presented the importance of urban agriculture. Urban agriculture is important in the sense that it reduces risks of starvation or malnutrition (Freeman 1991). This is because much of the produce from urban farms is consumed at household level. The pressure to indulge in urban agriculture seems to have been accentuated by structural adjustment programmes (SAPs) imposed by the IMF and the World Bank on developing countries. Such SAP components which include exchange rate devaluation, trade liberalisation, tax reform, removal of price subsidies and introduction of cost sharing programmes have resulted in an escalation of prices of basic food stuffs and all kinds of basic needs.

The low-income segment of society is hard-hit by these SAPs. Urban residents have hence reverted to growing their own food in cities. Urban grown food is relatively cheap because transport and storage costs are minimised and thus benefits the low and middle-income urban residents. Urban farming could, however, not be seen as a universal solution to severe food insecurity in cities. On the contrary, it could be taken

as one of the survival techniques for urban residents in times of economic stress and a way to enhance existing food supply channels.

Urban agriculture is also said to have a recreational value. Silk (1986) says that many people in Third World cities garden for recreational purposes because it is a healthy and stress reducing activity. Some cultivate because they hate sitting down idly, love "shamba" work and trying different types of plants (Freeman, 1993). This purpose of urban gardening could be crucial, most probably to the high income group who have enough space outside their homes (backyard) and can make use of roof tops and balconies. The low income group cannot afford to practise urban farming as a "luxury" since they have more pressing basic needs to attend to such as food, among others.

Obara (1988) asserts that urban agriculture may be seen as a vehicle to solving some social problems in urban areas. Citing the experience of Metro-manila, Obara says that urban agriculture reduces gang fights and other social problems. As an activity that occupies people's time, it could be seen as reducing the probability of engaging in full-time crime. However, this could not be seen as the prime motive of urban dwellers to engage in agriculture. Instead, if encouraged by the government, it could be seen as an endeavour by the authorities to minimise crime. The economic importance of urban agriculture seems to be an over-riding factor in its persistence. According to FAO (1996), the low-income urban dwellers earn an income from urban agriculture by selling any surplus through informal neighbourhood markets. Dennery (1995) says that urban cultivators sell any surplus when there is crucial need for money (see also Hart and Pluijimers, 1996).

2.1.2 Urban Agriculture in Nairobi

Several studies have focused on urban agriculture in the City of Nairobi (Lee-Smith *et al,* 1987; Obara, 1988; Freeman, 1991; Dennery, 1995; Mwangi, 1995). These studies have, however, come about in the late 1980s and early 1990s -a period when SAPs have been taking root in most Third World countries. Lack of studies preceding this period may suggest that urban agriculture had for long been ignored in the City of Nairobi as in other Third World cities.

In Nairobi Obara (1988:2) argues that, "agriculture provides vegetables, maize, fruit e.t.c. and in many cases livestock is reared". Investigating the role of urban agriculture in household food security, Mwangi (1995) argues that it leads to food security and better nutritional status among the low-income urban households. Urban agriculture thus makes an important contribution to the nutritional requirements of the urban deprived in Nairobi.

The Mazingira Survey of 1985 reveals that 30% of Nairobi households are engaged in agriculture within the city boundaries with the majority (82%) belonging to the low and very low-income groups. The survey showed that urban "shambas" were found in backyards (49%), roadsides/rail lines (17%), along rivers (13%), and other open residential and unused industrial areas. Urban farmers do not have land of their own or any other designated areas for food production. This could be looked at as a major draw back to the development of urban agriculture. However, as for women, Muller U990-.161) argues that, " As social actors (they) choose those strategies that match their skills, capital and social support and which are likely to succeed in the prevailing Political and economic situations in society."

As in other informal sector activities, incessant difficulties permeate urban agriculture in Nairobi. These problems are not common in rural agriculture and are seemingly unique to urban agriculture. Foremost of these is the urban land tenure problem (Dennery, 1995; Lee-Smith et al, 1987; Mwangi, 1995). Urban farmers use their rented, borrowed or illegally occupied land. This means that it can be reclaimed at any time and at short or no notice sometimes resulting to destruction of crops. The implication is that there is a low degree of security of tenure among urban farmers.

Other problems mentioned by several studies include financial constraints, lack of time during planting seasons (Dennery, 1995), lack of water and lack of credit (Lee-Smith et al, 1987). These problems are compounded by the illegal status of urban agriculture in Nairobi, as is the case in other Third World cities (see also Maxwell and Zziwa, 1990).

Urban agriculture in Nairobi is not recognised by the government despite its significant contribution to the country's Gross Domestic Produce (GDP). According to the Mazingira Survey of 1985, the value of crops grown in urban areas in one season was estimated to be US$17 million (Lee-Smith et al, 1987). As an informal activity, its characteristics make it seem (and it is) an initiative that meets much of the principles of local development based on self-reliance. In principle, it fits to what is referred to as the district focus for rural development (see Makokha, 1985). Despite this, urban agriculture is illegal. Specifically, Mwangi (1995:9) reports that according to the Nairobi City Council Public Health Department, "crop farming is not allowed within the city boundaries because crops encourage breeding of mosquitoes while tall crops such as maize act as hiding places for thugs". There are no policies in Kenya or by-

laws, which permit agriculture in any urban centre. Due to this, farmers may live in tear of harassment by city authorities.

Apart from the problems that urban farmers face, they take risks some of which are life threatening. Considering the tact that urban farms are located along the city's polluted streams, drainage and sewerage systems, it could be argued that farmers risk contracting water-borne diseases such as diarrhoea and cholera. They farm on these places without protective gadgets and this shows that there are pressing needs, which force them to indulge in urban farming.

Those who cultivate along roads, rail lines and on vacant industrial plots risk consuming contaminated foodstuffs. During planting, weeding and harvesting, they risk being knocked down by motor vehicles. Other times, they may be beaten by City Council askaris since the practice is illegal. Above all, they may face imprisonment if sued in a court of law and they risk economic losses in case they are fined.

Despite the problems and risks that urban agriculturists are faced with, they continue farming in the city. This may imply that urban farming is not a pass-time activity nor a luxury but an important economic activity. Because of the problems and risks urban farmers face, it is clear that urban farming is not a 'pleasant' economic activity. Thus people are only forced into it by the harsh urban economic situation. According to Muller (1990) [it J is one of those strategies that are likely to succeed in the prevailing political and economic situations in society and which fits women's skills.

The literature reviewed offers important insights into the practice of urban agriculture and its productive potential to urban economies in Third World Countries. But there are several gaps in this literature, which this study helps to fill.

First, a part from the impressionistic observation by Lee-Smith et al (1987) that women are involved in urban agriculture, none of the studies focuses on the factors that explain the involvement of women in urban agriculture. Secondly, the studies tend to look at urban agriculture as representing an undifferentiated social mass and thus give a general analysis of the problems facing urban agriculturists without considering women as a 'special category' of the urban population (Freeman, 1991).

Lastly, Masinde (1991) argues that women dominate farm work in Kenya, yet there is no study that seeks to explain the extent to which women have control over the income from urban farms. This study therefore seeks to find out the extent to which urban farming accords women some economic independence. The above issues are important for policy matters and may aid in developing what Lee-Smith (1994) calls "gender aware policies" for a gender aware city.

2.2 Theoretical Overview

This section outlines the main theoretical perspectives from which this study was conducted. Any sociological analysis involves theorising because the act of research is about making certain questionable assumptions explaining the nature of reality and how •t becomes intelligible to us. Any theoretical assumptions made structure the scope and nature of research including what are considered appropriate data and how the data are •nterpreted. This study utilises the following theories:

2.2.1 The Situational Approach Theory:

The situational approach theory was propounded by Thomas and Znanieck (1974).

The theory's core argument focuses on

(i) The idea of crisis;

(ii) The definition of the situation; and

(iii) The concept of social disorganisation, which brings about redefinition of the situation.

Thomas and Znanieck (1974) contend that human behaviour occurs under certain specific conditions. They point out that when people act as anticipated in primary group organisations, then there is nothing to define. However, redefinition of the situation becomes necessary when new influences appear to disorganise existing habits; when new stimuli demand attention; when the familiar situation is interfered with; or when a group is unprepared for an experience such as landlessness, unemployment, increasing costs of children's education, clothing and health. In all these cases, there is a "crisis" which is viewed as a threat that calls for a new approach - "'redefinition of the situation".

According to the situational approach theory, a "crisis" is seen as the most significant of human experiences affecting the actions of individuals and groups, their behaviour and influencing the context of culture, personality and the direction of socio-cultural change. The social disorganisation that arises as a result of any "crisis" calls for social reorganisation to ensure proper direction to the future course of events. Behaviour (or human action) is therefore situationally determined, for example, in the event of new

experience that calls for redefinition of a situation. The proponents of the theory argue that redefinition depends on:

(i) Cultural factors, which either independently or collectively influence subsequent behaviour,

(ii) Socio-economic factors:

(iii) Biological factors; and

(iv) Psychological factors.

In addition to the above, the physical environment, the social norms, values, attitudes and the people one interacts with may equally contribute to redefinition of a situation. Further, the individual's perception of the situation, its definition and meaning have a bearing on the next approach to the situation.

These factors could then be viewed as partly explaining the involvement of women in agriculture in Nairobi. This is in consideration of the fact that coping with urban realities in most Third World countries constitutes a kind of a "crisis" which necessitates response - "redefinition".

The questions that arise at this point are:

- To what extent do socio-economic factors explain the involvement of women in urban agriculture?
- To what extent is the involvement of women in urban agriculture a function of their socio-cultural background?

experience that calls for redefinition of a situation. The proponents of the theory argue that redefinition depends on:

(i) Cultural factors, which either independently or collectively influence subsequent behaviour;

(ii) Socio-economic factors;

(iii) Biological factors; and

(iv) Psychological factors.

In addition to the above, the physical environment, the social norms, values, attitudes and the people one interacts with may equally contribute to redefinition of a situation. Further, the individual's perception of the situation, its definition and meaning have a bearing on the next approach to the situation.

These factors could then be viewed as partly explaining the involvement of women in agriculture in Nairobi. This is in consideration of the fact that coping with urban realities in most Third World countries constitutes a kind of a "crisis" which necessitates response - "redefinition".

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The situational approach theory is likely to provide an explanation to the above questions given that it views human behaviour as adjustable and human beings as continuously attempting to come to terms with situations in which they find themselves. In this case the woman agriculturist may be seen as trying to come to terms with the urban economic "crisis". Escalating costs of basic necessities, low wages and pressure to meet subsistence needs constitute such a "crisis'" and thus explaining the involvement of women in urban agriculture.

2.2.2 Cultural Lag Theory

Although the situational approach theory views human behaviour as adjustable, the adjustment is not necessarily harmonious. There is a tendency for old forms of behaviour to persist and as a result create an»environment, which is less hospitable to the new.

In some instances, some parts of any given culture, which are so interrelated may adapt to each other at different rates. This according to Ogburn is a cultural lag, which occurs,

> When one of two parts of a culture which are correlated changes before or in a greater degree than the other part does, thereby causing less adjustment between the two parts than existed previously (Ogburn 1964:86).

The central focus of the cultural lag theory is the occurrence of change at unequal time. The demonstration of the lag presupposes certain conditions. These conditions include the ldent«fication of two variables, demonstrating that they were in adjustment at some

point in time, determining that one variable has remained behind in greater degree than the other and as a result there is less satisfactory adjustment than existed before.

In the context of this study, the argument is that rural people have their own way of life, which is different from that of urban dwellers. When these rural people migrate into cities, th^y are forced to adjust their way of life to be able to fit in the urban environment. However, the adjustment is not uniform as far as their socio-cultural and economic activities are concerned. They may find it easier to drop some of their socio-cultural traits than it is to wholly abandon some important rural economic activities such as farming. Due to limited job opportunities in the urban areas, some migrants (especially women) from agricultural societies may find it easy to utilize the only skill they have - that is, the skill of tilling land for purposes of food production.

In spite of the explanatory potential of the cultural lag theory in explaining social change, it has been subjected to various criticisms. The theory has been criticized on the grounds that it cannot be scientifically demonstrated and that there are difficulties in determining degrees of maladjustment in two aspects of a culture (Gwako, 1990).

The involvement of women in urban agriculture can partly be explained by the situational approach theory. The underlying argument is that people move into cities with an anticipation of securing employment to sustain themselves and prosper in life. **However,** given the competition for jobs and scarcity of the same in the urban areas, only the well educated are most likely to secure well paying jobs. A significant majority with low levels of education settle for lowly paid jobs with many others joining the informal sector as others remain unemployed. Faced with the reality that virtually all

services and commodities in urban areas have to be purchased, the unemployed and those with low income levels are faced with a crisis for they can hardly afford some basic necessities including food. It is at the wake of such a crisis that women, who are customarily charged with the responsibility of preparing food for their families (Masinde, 1991) turn to urban agriculture to eke a living or supplement household food and income. It is thus most likely that women urban cultivators are those without a wage employment, or in low paying jobs/ occupations.

Similarly, the cultural lag theory may help explain women's involvement in urban agriculture. This is in the sense that women have always been the prime practitioners of rural agriculture. Over time, they have mastered the skill of tilling land for purposes of food production. To them, farming is a way 6f life and an economic activity that may not easily be shade off. Once they move into the city, they may start small gardens on unutilised vacant land, perhaps as a hobby, as a way of reminding themselves of their rural roots, or even as an economic activity geared towards supplementing household food and income. Majority of the farmers are thus likely to be migrants with prior experience in agriculture from the rural areas. It may not be surprising to find that, among urban cultivators are women of high socio economic status. In majority of the cases, women's involvement in urban cultivation may be seen as a function of a cultural lag than the need for food and income.

2-3 Research Hypotheses

^n the basis of the foregoing discussion and the objectives of the study, the following hypotheses have been generated:

1. The socio-economic status of cultivators influence their degree of involvement in urban agriculture.
2. The cultivators' age influences their degree of involvement in urban agriculture.
3. The cultivator's land ownership status influences the physical distribution of gardens in the city of Nairobi.

2.4 Definition of Concepts and Operationalization of Variables

Independent and Dependent Variables and Concepts

Concepts are used to organise and summarise views. They present perceived relationships by simplifying the thinking. We define them so as to be understood within our study context. Independent variables are those variables considered to influence the dependent variables. They therefore account for some of the variations observed in the dependent variables. For this study, the independent variables are the socio-economic status factors of occupation, income and education level. Other independent variables include age and a cultivator's land ownership status.

On the other hand, dependent variables are those that are believed to be influenced by others. This study has 'degree of involvement in urban agriculture' and physical distribution of gardens as the dependent variables.

Occupation

This refers to the main socio- economic activity of the respondent. This study had three occupation categories namely; professional workers, casual labourers, and the

unemployed. Operationally, the professional workers were considered to be in high status occupations than casual labourers while the unemployed ranked lowest.

Income

This refers to the gross monthly income computed on the basis of reported monetary earnings of the respondent. This variable was also measured by categorising income into high or low levels. Those earning above K.Sh. 4,500 were considered as having high incomes and the rest, low.

Level of Education

This refers to the level of schooling completed by the respondent interviewed. The study had three levels of education, namely; none (no schooling), primary, and secondary and above. Those respondents with no schooling and primary level education were considered to have low levels of education while those with secondary education and above were considered to have attained high levels of education.

Land Ownership Status

This refers to either permanent or temporary possession of land. This variable has been measured by asking questions on whether the land is rented, purchased, invaded or given free by the owner.

Age .

This refers to the actual number of years lived by the respondent as at the time of the interview. Operationally those respondents in the 20-30 years age category were

unemployed. Operationally, the professional workers were considered to be in high status occupations than casual labourers while the unemployed ranked lowest.

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Age .

This refers to the actual number of years lived by the respondent as at the time of the interview. Operationally those respondents in the 20-30 years age category were

regarded as young, those in the 31-50 years age category were regarded as middle aged while those above 50 years were regarded as old.

Degree of Involvement in Urban Agriculture

This is used to refer to the frequency of indulging in urban cultivation. This variable has been measured by asking respondents 'who made arrangements for them to acquire a garden in the city'. Those who made arrangements in person were categorised as having higher involvement than those who engaged the services of others to acquire a garden. Other indicators used were: execution of the basic agricultural practices namely; planting, weeding, and harvesting, and number of gardens that one has in the city.

Physical Distribution of Gardens

This refers to the location of gardens with respect to rivers, roads, railway line, residential areas, shopping (business centres), sewerage system and unused public/private land. For purposes of hypothesis testing, this was taken to refer to location of gardens with respect to the owner's place of residence in the city. Gardens located up to 500 metres were categorised as 'near residence' while the rest were categorised as 'far from residence'.

Control and Management of Garden Activities and Garden Products:

This is used to refer to the capacity for decision making regarding the location of **garden,** labour appropriation, disposal of garden products and use of income accrued from the sale of garden products.

Urban Agriculture:

According to Maxwell and Zziwa (1992), urban agriculture is defined as any farming technique in an urban environment which involves food production (that is, mainly food crop cultivation and livestock production), forestry and flower production. This study focuses mainly on the food production component of urban agriculture.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Site Description

Nairobi is the capital city of Kenya and is one of the country's eight provinces. It lies at an altitude of 1700 metres (5500ft) above sea level. From North to South, it stretches from 2° 10°S and from East to West; it stretches from 37° 10° to 36° 40°E (Anangwe 1995:47). Lying 140 km from the equator, Nairobi's temperatures are altitude-modified tropical but not torrid (Situma, 1992).

The mean annual rainfall is 1080 mm falling into two distinct seasons: the long rains from March to May and the short rains from mid October to early December. On account of the high altitude and proximity to the equator, Nairobi's temperatures are typical of tropical conditions. Recorded temperatures range from 12.6°C to 26.7 C (Opinya, 1982:3).

Early descriptions of Nairobi area by Joseph Thomson in 1885 tells of flourishing border trade in grain, flour, vegetables and fruits from the Kikuyu in exchange for sheep, skins and hides from the Maasai (see Lamba, 1994). Undoubtedly, the above description implies that the main land used in Nairobi region (in the past) included pastoralism and arable agriculture. Ominde (1968) indicates that Nairobi is situated in the southern end of Kenya's agricultural hinterland - an indication that the city is in a region where agriculture is possible.

Nairobi has grown rapidly since it began as a railway depot in 1899, following a decision by the British in 1895 to connect the coast with Uganda by means of a railway. Given this early impetus, the city has continued to increase its economic vitality and primacy in the country.

The city's population growth is mainly a function of the influx of people through migration and the natural increase. The city's population has grown tremendously from 509,286 persons in 1969 to 1,324,570 in 1989(CBS, 1994:3-6). Currently, Nairobi has a total population of 2,143,254 inhabitants on a 696 square-kilometre area and has a density of 3,079 persons per square-kilometre (CBS, 2000:33).

Several problems have resulted due to this high population and include: shortage of housing, unemployment, street children and general youth problems among others (Anangwe, 1995). The problems have created a "crisis' in urban life. The rising unemployment is distinguished by the growth of a disproportionate tertiary (informal) sector of self-employment. This consists of open air garages, kiosks, hawking, brewing, e.t.c., otherwise known as 'Jua Kali'. The sixth development plan encouraged the development of these small-scale enterprises because of the low capital requirements and their easy establishment (CBS, 1989-1993:164). Despite this encouragement by the government, urban cultivation remains illegal (Mwangi, 1995). It, however, has an economic value to the country (Lee-Smith et al, 1987).

The city exhibits wide socio-economic differences reflected in the distribution of income, infrastructure, housing and other services among the various groups of its

population in different parts of the city (Ngau, 1979:171). To a larger extent, the settlement patterns in the City of Nairobi depict these socio-economic differences.

The low-income urban dwellers occupy the slums (Syagga and Kiamba, 1992; Lamba, 1994) while the high-income group occupies the posh areas of the city. Small urban gardens are found in all these areas but are more conspicuous in the slums. For purposes of representativeness, there is need to focus on the low and high-income residential areas.

3.2 Sampling Procedure

A sample is a small proportion of a population selected for observation and analysis. By observing the characteristics of the sample, o"ne can make certain inferences about the population from which it is drawn (Best and Kahn 1989:11).

The process of sampling makes it possible to draw valid inferences or generalizations on the basis of careful observation of variables within a relatively small proportion of the population (Best and Kahn, 1989:10). Thus when selecting the appropriate method, the researcher must strive to avoid bias, and achieve maximum precision (Moser and Carlton, 1971:63)

According to the 1999 population census, Nairobi is administratively divided into eight divisions namely: Dagoretti, Kibera(Langata), Central(Starehe), Pumwani(Kamukunji), Makadara, Embakasi, Kasarani and Westlands (CBS, 2000:33).These administrative divisions are also the parliamentary constituencies(see Appendix B).

Each of these divisions is made up of smaller units headed by chiefs who are answerable to the provincial commissioner (Anangwe, 1995). The residential clusters encompassed in these eight divisions exhibit both inter-ethnic and class mixture.

The sampling procedure followed in this study was the multi-stage sampling method, which belongs to the category of probability sampling techniques. Multi-stage sampling is a technique whereby sampling is done in stages. It is used to reduce the sample from unmanageable size to a manageable one in an unbiased way as the stages increase in number (Moser and Carlton, 1971). Other sampling techniques may be used within the stages. The reasons given by Moser and Carlton (1971:106), as to why the multi-stage sampling technique is appropriate also apply to this study. For instance, to spread the fieldwork over the whole city is quite expensive and inconveniencing especially considering the vastness of the area. Thus, this technique is usefiil when handling a large population spread over an area and presumed to represent a community (Mulusa, 1990:102).

Multi- stage sampling is also appropriate when there is no satisfactory sampling frame for a whole population especially in developing countries. This technique thus obviates the necessity of having a sampling frame covering an entire population. The application of the multi-stage sampling proceeded as follows:

Stage 1

In selecting the divisions, random sampling was used. Random sampling is that method °f drawing a portion (or sample) of a population or universe so that each member of the P°Pulation or universe has an equal chance of being selected (Kerlinger, 1964:52).

Central division was however eliminated on the grounds that it is the abode of the central business district and hence there is very limited space for any type of farming.

In order to accomplish the task of selecting the divisions, the researcher wrote the names of the remaining seven divisions on pieces of paper and gave them to one of the would be research assistants to fold, put in a container and mix them up. The researcher then picked up four pieces of paper. The names on the "picked" papers represented the divisions in which the research was carried out. Such selected divisions were: Westlands, Dagoretti, Kasarani, and Kibera (Langata).

The exercise of selecting divisions in such a manner constituted a simple random sampling technique, which is the basic probability sampling design incorporated in all the more complex probability sampling designs (Judd and Kidder, 1986:154).

The choice of four divisions was deemed appropriate in the sense that it covered more than half of the divisions where agriculture is practiced in the city. In addition it was manageable given the limited time and resources available to the researcher.

Stage 2:

Having randomly selected the divisions, the second and final stage involved determining the number of respondents to be interviewed from each division. Since there is no available complete list of all female cultivators in the City of Nairobi, and that it is financially expensive, time consuming and cumbersome to prepare one, thirty-(30) respondents were conveniently interviewed from each of the four selected divisions to form a total sample of 120 respondents.

Here convenience sampling was used since it was not possible to randomise the selection (because of the lack of a sampling frame). In convenient sampling, one simply reaches out and takes the cases that are at hand, continuing the process until the sample reaches a designated size (Judd and Kidder, 1986:151). Convenient sampling is also referred to as "volunteer sampling" (Mugenda and Mugenda, 1999:52)

The researcher and research assistants walked into the selected divisions and interviewed any women found cultivating or working in any "shamba" in the city and claimed ownership of the "shamba" or the crops growing therein. In cases where it was not possible to get another woman working in the next "shamba", snowball sampling was used. In such a situation, interviewers would request the respondent already interviewed to direct them to the owner of the next "shamba" if she was within reach. This constituted snowball sampling. In snowball sampling (mud ball), initial subjects with the desired characteristics are identified using purposeful sampling technique. The few identified subjects name others that they know have the required characteristics until the researcher gets the required number of cases. This method is useful when the population that possesses the characteristics under study is not well known (Mugenda and Mugenda, 1999:51). Thus convenient (availability) and snowball sampling were used concurrently in selecting respondents.

3.3 Units of Analysis

In this study, women urban farmers were the units of analysis. A sample of 120 women urban cultivators was drawn to make up the units of analysis for this study.

Women form the bulk of farm labourers in the City of Nairobi - 62% (Lee-Smith et al. 1988:226). Further, they have occupied a central role in African economies being the main agricultural producers and food vendors in cities. Most of the women are migrants into the city, residing here either on their own or by virtue of their spouses' occupation although their own participation in both the formal and informal sectors is rising. The women represented very different ethnic groups, education levels, age, and professions and thus provided variant responses in the study.

3.4 Methods of Data Collection

This study uses primary data collected by administering an interview schedule (standard questionnaire) with open and closed ended questions. The questionnaire was administered during the morning hours of the day and in some instances in the afternoon by appointment until all questionnaires were completed. The reason why questionnaires were administered during the morning was that many women farmers did their farm work in the morning and set aside the afternoon for other chores. The questionnaire has the advantage of allowing for the sampling of a larger population than the other techniques and is relatively easy to administer (Anangwe, 1995:53).

The questions in the questionnaire were structured so as to sound or seem like an ordinary conversation. Given the illegal nature of urban agriculture, such structure gave the questionnaire a personal appeal so that a respondent gave out information without fear of victimization or apprehension.

The duration of the interviews was about 40 minutes although this depended on factors such as linguistic differences, whether the interviewer had established the appropriate

rapport, and where the questionnaire was being administered. If the questionnaire was being administered at the farm, respondents tended to be more free and the interview took a relatively shorter period.

However, at home, many respondents were not always at ease and thus took their time before answering sensitive questions such as those concerning income, household expenditure and acquisition of land. In such instances the questionnaire took a longer time to complete. Through probing of answers given in open-ended questions, useful qualitative information was also solicited. Non-formal interviews were also used to clarify some issues raised through answers given in open-ended questions.

Non-participant observation was also employed by the researcher in an attempt to acquire additional information on urban cultivation. The research assistants made specific observations regarding the location and sizes of gardens, crops grown and gender of people doing actual farm work in each area visited. The researcher also made observations in the areas he visited. The information collected through observation was entered in notebooks. At the end of every field day the researcher held discussions with the research assistants with a view to extract any relevant information gathered through observation. This method is what Prewit (1974) calls 'observational research'. Through observation it was noted that more women than men were doing actual planting and weeding in the farms.

Documentary sources of information were also used. Here, there was an extensive use °f written materials available in libraries in order to have general background knowledge of the subject.

Fieldwork commenced in March 2000 after the researcher obtained a permit from the office of the president. This permission was sought in order to allow the researcher to roam about in the selected areas without fear. The permit, together with the researcher's university identification card helped in convincing some suspicious respondents that the research was not ill intended but an honest academic endeavour.

The duration of the fieldwork was one and a half months lasting from the month of March 2000 to mid April 2000. This was an appropriate period because it was during the long rain season (Opinya, 1982) and many respondents could be found in their farms either planting or weeding.

Urban cultivation is by and large illegal (Mwangi, 1995). Because of the fear emanating from such a state of affairs, research assistants had to establish rapport with respondents by, first, introducing themselves and explaining the purpose of the study. Establishing rapport as a prerequisite to gaining information when using the questionnaire is cited by most scholars as necessary in order that, "The information may be given willingly and therefore be both reliable and valid" (Best and Kahn 1989:181).

3-5 Data Collection Exercise

Owing to the vastness of the city of Nairobi and the number of respondents required, tWo research assistants were employed to help in carrying out the study. Together with the researcher, these made up a team of three.

The research assistants had to be fourth form leavers because it was essential that maturity and intelligence be put into account when interviewing people's wives and more so, illegal farmers. Along with this, the assistants had to be fluent in both Kiswahili and English for purposes of coping with linguistic differences among respondents. They also had to be accurate and honest for purposes of recording the proper information; have a pleasant personality and temperament for easy establishment of rapport.

After selecting the research assistants, the researcher conducted a briefing session to explain the requirements and expectations of the study. The researcher divulged the objectives of the study and its importance and then introduced the research assistants to the questionnaire, explaining each question until they were clear to them.

The researcher then trained them on how to administer the questionnaire and how to probe when the respondent was reluctant or out rightly irrelevant in responses. Training of interviewers on the structured questionnaire ensured uniformity in asking the questions, thereby eliminating bias and ensuring neutrality.

To ensure that the questionnaire was efficient in content and formulation, a pre-test was carried out. First, an appropriate sample was selected following the rule governing pre-tests, which states that, "At least 10% of the total sample size is adequate"(Anangwe, 1995). Twelve (12) questionnaires were thus administered using the same guidelines that would be employed in the actual sampling procedure. This was a timely measure in revealing defects for adjustment.

Of the two assistants, one went to Kasarani area and collected a total of thirty- (30) responses while the other went to Dagoretti and collected a similar number of responses. The researcher went to Kibera and westlands divisions and collected thirty- (30) responses from each division. These responses totalled 120 questionnaires. In the course of administering the questionnaire (interview schedule), any additional information from the respondents was recorded in a notebook. This yielded qualitative data, which was later, incorporated in data analysis and presentation of study findings. Qualitative data are useful when one needs to supplement, validate, explain, illuminate, or reinterpret quantitative data gathered from the same setting (Miles and Huberman, 1994).

3.6 Data Presentation and Analysis Procedures

The ultimate goal of data analysis is to summarise the study findings in a way, which generates answers to the research questions. Quantitative data collected through the standard questionnaire (interview schedule) was processed using statistical package for social scientists-SPSS computer package. The use of SPSS in data analysis yielded both descriptive and inferential statistics, which were used in presentation of research findings and data analysis respectively.

Descriptive statistics are concerned with arranging, summarising and somehow conveying the characteristics of a range of numbers (Harnett and Murphy, 1980). Further, they help the researcher to meaningfully describe a distribution of scores or measurements using a few indices or statistics (Mugenda and Mugenda 1999:117). Such statistics used in this study include, frequencies and percentages.

Inferential statistics are indices that help a researcher to draw inferences about a given phenomenon I the population from a study based on a sample (Khasiani and Mugenda, 1992). The inferential statistics are mostly used in chapter five and include cross tabulation, chi-square(X') and contingency coefficient (C). Cross - tabulations are joint frequency distributions, which simultaneously tabulate the sample on the separate dimensions (Prewit, 1975). Tabulation involves the determination of the proportion of units in a study, which combine a given pair of values for the variables being cross-tabulated.

The chi-square (X^2) is a test of statistical significance that can be used to determine whether a systematic relationship exists between variables. It measures whether

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something being observed differs significantly from something expected (Nyang'au, 2001). The test requires that variables be measured at nominal level.

Contingency coefficient is a non- parametric statistic that measures the extent of association or relation between two sets of attributes. It is mostly used when data are measured at nominal level though it can at times be used even with data measured at the ordinal scale (Siegel, 1956). It can be utilised with a table of any size. It has a minimum value of zero but the maximum value depends on the size of the table (Nie, et al 1970).

Problems Encountered During Data Collection.

The process of data collection was not without obstacles. Most of these were experienced during administration of the questionnaire and included:

a) Language problems.

Majority of the respondents were either not fluent in English or did not understand it. In such cases interviewers had to translate the questions into Kiswahili without losing the intended meaning. This meant that the questionnaire took longer to administer than expected due to elaborations.

b) Time for interviews.

This proved to be an obstacle because there was no standard time or place that could be dictated by the researcher/ interviewer in order to administer the questionnaire. Thus available respondents were interviewed regardless of time and place. In a tew instances, interviews carried out in the farms were interrupted by rain. Some respondents complained that interviewers were interrupting their work schedules in the farm and demanded appointments. Many of such appointments failed because respondents did not show up.

c) Suspicion.

Given the illegal status of urban cultivation, some potential respondents refused to fill the questionnaire after the interviewers explained the objectives of the study. This resulted into a waste of time and thus data collection took much more time than anticipated. Fear and suspicion were also exemplified in the failure of appointments made with potential respondents.

CHAPTER FOUR

DATA PRESENTATION

4.1 Introduction

This chapter uses descriptive statistics to present the data collected from the field. The findings presented were processed by the following sequential activities. After data collection, data was subjected to clerical editing to ensure that all questionnaires were filled. Other supplementary information in diary and notebook was also organised and preserved. The next activity involved listing and coding of responses inorder to make a codebook. Afterwards, data was entered into the computer using SPSS - PC to generate descriptive statistics, which include simple frequencies and percentages of the responses. Such statistics have been used in the presentation and illustration of data in this chapter. Indepth analysis and testing of hypotheses follow in Chapter Five.

4.2 Background Information about Women Urban Cultivators

Background information of the study sample is important because it gives an insight of the population that was studied. Some of the important background characteristics include age, marital status, level of education, occupation, income, ethnicity, religion, the number of dependants living with the respondent in the city and the respondent's migrant status. These factors are considered to be important in this study because of their influence on the respondents' involvement in urban agriculture.

Age and Marital Status

Of the 120 women cultivators interviewed, 15% (18) were aged between 20 and 30 years; 40% (48) were aged between 31 and 40 years; 28.4% (34) were aged between 41 and 50 years while the rest 16.6% (20) were above 50 years of age.

This implies that urban cultivation is not a domain of the relatively young and very old women (represented by the 20-30 and over 50 years age bracket respectively), but an activity carried out by the relatively middle aged women who are physically active. This is supported by the finding that the percentage of women cultivators aged between 31-40 years (40%) and that of those aged between 41-50 years (28.4%) was higher in the sample than the percentages of women cultivators aged between 20-30 years (15%) and that of women aged above 50 years (16.7%) which do not differ significantly. It could be asserted that young women prefer other urban wage jobs other than farming, which is mostly associated with the rural areas. Further, old women may not be able to cope with urban farming, which requires physical energy and may thus prefer other non-farm jobs.

Over half (65.8%) of the respondents were married while 34.2% were single either by way of divorce (5.8%) separation (1.7%), widow hood (15.8%) or having not been married at any one time (10.8%). Majority of the respondents (97.5%) had children while only 2.5% did not have. Of those married, 65% (of the total sample) stayed with their husbands in the city while only 0.8% stayed alone in the city and their husbands stayed elsewhere.

Only 3.3% of the respondents' husbands were unemployed while 39.2% were either casual labourers (25.0%) or artisans (14.2%). Some 11.7% of the husbands were small-scale entrepreneurs, 8.3% were professional workers (teachers, engineers, bankers, secretaries) while only a mere 2.5% (10) were landlords. Some 60.8% of the

respondents were in Monogamous marriages while 5.0% were in Polygynous marriages.

The foregoing discussion indicates that forming in the city is mostly practised by married women (65.8%) in monogamous unions (60.8%) who have children (97.5%) and whose spouses are mostly in the low income-earning group (casual labourers and artisans) (39.2%). See Table 1 and 2 below. It could thus be purported that urban farmers are women whose wage incomes and that of their spouses cannot adequately cater for their household needs. The finding that majority of the women are in monogamous unions could be explained by the fact that monogamy is largely becoming a characteristic of the modern urban family structure.

Table 1 Distribution of respondents by Age

4ge (years)	No of respondents (N)	Percentage (%)
20-30	18	15.0
31-40	48	40.0
41-50	34	28.4
above 50	20	16.6
Total	**120**	**100.0**

Table 2: Distribution of respondents by marital status

Marital status	No of respondents (N)	Percentage (%)
Married	79	65.8
Single	41	34.2
Total	**120**	**100.0**

Level of Education, Occupation and Income

Education provides not only basic literacy but also higher level training to make Possible utilization of and advances in every aspect of life. Indeed education plays a

great role in choice ofjobs to be done. In this study, majority of the respondents had little or no formal education.

Slightly less than half (47.5%) had attained primary level of education while 22.5% had no formal education and 23.3% had secondary level of education. Only 5.8% underwent adult literacy while 0.8% had attained University level of education. Thus, the low educational status of the respondents partly explains their lack of formal employment as explained below.

Regarding occupation, 40.8% were unemployed, 25.8% were small business operators while 19.2% were causal labourers. Landladies constituted 12.5% of the total sample and only 1.7% (2) of the respondents were professional workers. Evidently, majority of the urban female cultivators are either unemployed or underemployed. As a result they are forced to use their physical energy and skill in tilling urban land for purposes of producing food and earning an income as shall be explained later. According to the ILO report (1972:59), the worst of all possible circumstances from the point of view of seeking work is to be young, uneducated and female. In line with this assertion, the study established that urban agriculture is practised by the uneducated and the relatively low educated women even though, on the contrary, they are relatively aged. These form the bulk of the unskilled labour force.

Respondents were asked to provide information on their monthly incomes and household expenditures so as to convey a picture of the role of food produced from urban shambas in the day-to day running of their households. However, the data on

monthly income of respondents needs to be treated with caution. This is because many respondents saw their husbands' income as part of their monthly income.

In fact 72.5% of the respondents said that they had other sources of income with 52.5% asserting that their husbands and children were their other sources of income. Only 12.5% got their income from sale of farm produce.

Thus the figures on the respondents' monthly income tend to reflect more on the household income than the individual woman's income. This is exemplified by the fact that even though 40% of the respondents said that they were unemployed and had no gainful source of income, only 4.2% had no monthly income. Thus, if the data is treated as reflecting household income, then the following results were achieved.

Table 3. Distribution of respondents by monthly household income

Amount (ksh)	No of respondents (N)	Percentage (%)
Nil	5	4.2
Up to 4,500	48	40.0
4501-9000	36	30.0
Above - 9000	31	25.8
TOTAL	**120**	**100.0**

The data presented in Table 3 above shows that majority of the respondents' household income is upto ksh.4500 (40.0%). Given the high cost of living in the city (and the fact that it is an household income) this is an income within the bracket that encompasses **the** low-income earners given the exchange rate of one dollar to ksh. 78.4 (Daily Nation, Wednesday, June 13, 2001) and that the minimum wage in Kenya is **Ksh**.3352.00 (Daily Nation, July25th, 2001).

Ethnicity and Religion

Ethnicity and religion are important variables because religious and ethnic orientations and ideologies still play a key role in choices (Anangwe 1995).

The women in the sample represented 9 out of the 42 ethnic groups present in Kenya as indicated by the Kenya population census of 1979. It is important to note that every ethnic and religious group has its own cultural demands, some of which may be similar across ethnic and religious boundaries and others that are more diverse. Thus ethnicity and religion have a lot to do with the role of women in the economy especially the use of land for purposes of food production (an economic activity). For example, Islam portrays 'the man' as the sole breadwinner and confines women to household chores while Christianity is not explicit on whether or not women should indulge themselves in economic activities. Thus Islam relegates women into 'a loafer situation* (see Yunus and Jolis, 1998) while Christianity leaves women at will to work and earn. Indeed, the Protestant ethic portrays the Protestants' frugality in business regardless of sex (See Weber, 1864 - 1920).

In this study, disparity is noted in the way ethnic and religious groups are represented. The sample had a larger representation of women from the Kikuyu ethnic group (59.2%) and the Akamba (15%) as compared to other groups. This may be largely due to the site selected for the study, which closely borders Machakos district and central province. Further there was a great disparity in the way ethnic orientations were represented in the study with 95.8% of the respondents being from the agricultural (cultivating) communities while only 4.2% were from the non-agricultural (non-

cultivating) communities. Thus it could be said that most of the urban women cultivators have an agricultural background.

Arguably, the close proximity has facilitated migration into the city since it is not expensive. This favours the Kikuyu who occupy the central province neighbouring Nairobi and are also an agricultural community (Kenyatta, 1978) and the Akamba of Machakos district, which borders Nairobi to the South East.

Table 4. Distribution of respondents by ethnic group

Ethnic group	No of respondents (N)	Percentage (%)
Kikuyu	71	59.2
Akamba	18	15.0
Luhyia	13	10.8
Luo	6	5.0
Nubian	4	3.3
Kisii	4	3.3
Meru	2	1.7
Taita	1	0.8
Somali	1	0.8
Total	**120**	**100.0**

There was also a great disparity in terms of religious backgrounds of the respondents. Majority of the women in the sample were Christians (95%) while only 5% were Muslims. No other religious groups were represented in the sample. As already pointed out Christianity leaves women at will to work and earn.

This may explain the high percentage of Christian women in urban cultivation. However, in Islam, the rules of *purdah* (literary meaning, "curtain" or "veil") do not allow women to leave their houses (Yunus, 1998:93).

[e] term *purdah* refers to a range of practices in response to the Koranic injunctions to guard women's modesty and purity. In its most conservative interpretation, it means

women are forbidden to be seen by any men except their closest male relatives. Many of these women do not go out of their homes to visit their neighbours let alone to work.

The rules *of purdah* do not prohibit Muslim women from cultivating. They only inhibit them from being seen by 'other' men. Urban farming is usually done away from ones residence due to lack of vacant land around residential areas. Thus, by going to other areas of the city to farm. Muslim women risk infringing the rules of *purdah* for other men shall see them. In addition, such rules could be seen as some of the socio-cultural practices that are not easily abandoned by the practitioners even though they have moved into the city. This is in line with the arguments of the cultural lag theory that there is a tendency for 'old' forms of behaviour to persist and as a result create an environment which is less hospitable to the*"new'. Such conservative notions of the Islamic religion explain why very few Muslim women indulge in urban agriculture, which is carried out far from ones residence as shall be explained later.

Number of Dependants Living With the Respondent in the City

For purposes of this study, number of dependants referred to the number of children whose needs were directly catered for by the respondent. These included small children who had not attained school-going age, children in pre-primary and primary school, and those in secondary school and in college. Thus the data does not include the respondents' children who were independent.

Study findings indicate that 27.5% of the respondents had two (2) dependants to teed, [clo]the, shelter, and educate. Some 21.7%had 3 dependants while 8.3% had 4 [de]Pendants. A significant minority (20.8%) had no dependants. See table 4b.

Distribution of respondents by number of dependants

Number of dependants	Frequency (N)	Percentage (%)
O(None)	25	20.8
	22	18.3
2	33	27.5
3	26	21.7
4	10	8.3
5	3	2.5
8		0.8
TOTAL	120	100.0

NB: The above figures should not be taken to represent household size nor the number children per respondent. Rather they represent the number of dependants that a respondent is directly responsible for.

Respondent's Migrant Status

Before independence, the administrative boundaries of Nairobi enveloped an area of approximately 65km^2 (Freeman, 1991). Since then, Nairobi has grown tremendously and its area currently stands at 696km^2 (CBS 2000). Being an urban area, and the capital city of Kenya, it offers the opportunities, which most cities have to offer such as employment, and is thus the home of many migrants. Most women in the sample were migrants (84.2%) by virtue of the fact that they had moved to live with their husbands, who for purposes of gainful employment resided in Nairobi. Only 15.8% of the respondents were born in the city. Indeed, 37.5% of the respondents followed their husbands in the city while 30 % came seeking for employment. The rest came for reasons such as, to pursue education (1.7%), followed parents (4.2%), to pursue business (3.3%), in search of a peaceful place to live in (4.2%), and to settle on their purchased plots (2.5%).

As a feature, migration is important in this study because migrants tend to carry with them some of the characteristics from their origin (Gugler 1981). These migrants remain firmly rooted in the rural community in which they grew up. Some continue to see themselves as members of a rural community and anticipate returning there. Such a commitment suggests that many migrants remain peasants at heart and that they do not become urbanites.

The literature on urbanization gives the impression that rural migrants to the city suddenly find themselves denied all opportunity of pursuing the customary rural occupation (farming). This assumption is far from true because adopting urban patterns of behaviour does not require forgetting how things were done in the rural home (Gugler, 1981). Thus, working migrants continue to behave in urban or rural ways as the situation demands. For those whose urban wages cannot cater for their household needs adequately, cultivation, which is predominantly a rural economic activity, remains an option.

Majority of the women in the sample (53.4%) migrated into Nairobi between 1976 and 1990s. Some 20% came before then while 10% came after 1990. Only one respondent (0.8%) could not remember when she came to the city while 15.8% were born in the city. Evidently, 94.2% of the total sample were migrants from the rural areas and perhaps had some knowledge on cultivation, which is predominantly a rural economic activity in Kenya. Presumably, it is this knowledge that migrants have put in practice after failing to secure themselves wage jobs in the city.

4.3 Commencement of Cultivation in the City

Most of the respondents (45.0%) started cultivating in the city between 1981 and 1990. This is a period when SAPs were taking root in most third world countries and a period of economic decline in the country. The growth rate of the real gross domestic product declined as a result of prolonged drought, domestic macro-credit problems and a decline in real investment. These problems were compounded by inflationary pressure and removal of price controls (CBS, 1994).

A small number of respondents (6.6%) started farming in the city before 1970. Some 10% started cultivation between 1971 and 1980 while 38.4% started cultivation after 1991.

These findings show that the phenomenon of urban cultivation has been on the increase since independence. This could imply that the rate of urbanization has been more than the creation of jobs resulting to what Sovani (1969) refers to as over-urbanization. In over-urbanization, the rate of job creation (through industrialization) is lower than the movement of people into urban areas (urbanization). Unavailability of vacant space (land) in the urban area through establishment of residential and industrial premises or occupation by other cultivators could explain the decline recorded for 1991 and after (see Table 5 below).

Table 5. Distribution of respondents by year urban cultivation was started

lYear	**No of respondents (N)**	**Percentage (%)**
I Upto 1970	8	6.6
1971 - 1980	12	10.0
1981 - 1990	54	45.0
M991 and after	46	38.4
[Total_	**120**	**100.0**

4.4 Occupation at the Start of Urban Cultivation

The female labour force participation rates in Nairobi are the highest for any province (Anangwe 1995: 98). However, due to shortage of employment opportunities available in the urban areas, there is stiff competition for the limited available options.

This competition locks out the uneducated and unskilled labour force who turn to the informal sector activities of which urban agriculture is one.

In this study 50% of the respondents were unemployed when they started urban cultivation while 26.7% were casual labourers. Small-scale entrepreneurs accounted for 17.5% of the women in the sample. This implies that in stiff competition for limited employment opportunities in the city, urban agriculture remains an option for most of the unemployed women or those earning minimum wages such as casual labourers. See table 6.

Table 6: Distribution of respondents by occupation at start of urban cultivation

Occupation at start of cultivation	No of respondents (N)	Percentage (%)
Unemployed	60	50.0
Casual labour	32	26.7
Business lady	21	17.5
Professional worker	4	3.3
In school	2	1.7
Land lady	1	0.8
Total	**120**	**100.0**

4.5 Purpose of Crops Grown in the Respondents' Initial and Current Gardens

Given the climatic conditions of the city of Nairobi with a mean annual rainfall of 1080mm and temperatures ranging from 12.60°c to 26.70°c, it is possible that a wide range of food crops can flourish in the area. Early descriptions of the city tell of trade in grain, vegetables, flour and fruits (Lamba, 1995). This description concurs well with

the findings of the study where the women in the sample grew different combinations of crops. Such crops included cereals (maize, millet, sorghum), pulses (beans, peas, lentils) and horticultural crops (vegetables, carrots, fruits, tomatoes and root crops). All these are food crops and this suggests that urban agriculture is a practice geared towards food production for the urban poor.

Through observation, it was evident that farmers had grown other non-food plants such as nappier grass in their shambas. However, during the interviews, such plants were not mentioned. This may imply that food crops are more important in urban cultivation than any other crops.

Women are an important category of economic and social actors who facilitate the role of the family in human survival in their various multiple roles (Korongo, 1999). This is despite their low socio-cultural and economic status in society. As indicated earlier, many women were unemployed (50%) or casual labourers (26.7%)when they started urban cultivation. As expected, many should have engaged in urban agriculture with the aim of supplementing household food supply or household income. The question regarding motives of women urban farmers for cultivating their plots produced a rather narrow list of first mentioned reasons.

The patterns of consumption of food produced by women farmers in the city point to the importance of cultivation for the household subsistence but not necessarily direct consumption. The study findings indicate that 66.7% of the women engage in urban agriculture to produce food for domestic consumption. A part from meeting subsistence needs, there is also a fairly significant amount of urban produce being

earmarked for cash sale. Almost a third (32.5%) of the respondents stated that they sold all or part of their produce for cash. However, of those who sold their crop yields, only 5.0% (of the total sample) grew crops purely for purposes of sale while the rest-(27.5%) produced food for both household use and sale.

The general contention in food production has been that food and other raw materials are produced in the rural areas and transported to the urban markets either for consumption or for processing. The fact that 66.7% of the respondents grew crops for purposes of domestic use, food production in Nairobi can no longer be seen as external to the city. It could be asserted that the harsh economic conditions in the city have forced urban residents to device alternative ways of producing food. This is because food supply from external sources is either inadequate or the already processed food products are too expensive for them. Table 7 gives details of purposes of crops grown by respondents in their first garden.

Often the cash income of many low-income families in Nairobi from wage employment (and other sources) is not adequate to provide sufficient food and meet household needs. Thus the pressure from such inadequacies is a strong stimulus to "desperate" women to overlook the city by-laws against urban cultivation and risk growing of subsistence crops on any vacant land.

Table 7. Distribution of respondents by purpose of crops grown in first garden

Purpose of crop	No. Of respondents (N)	Percentage (%)
Household use	80	66.7
Household use and sale	33	27.5
Sale	6	5.0
.Other (for the church	1	0.8
Jotal_	**120**	**100.0**

Farmers have continued to grow the same type of crops they used to grow in the first gardens with majority (38.3%) concentrating on cereals, pulses and horticultural crops while 35.8% have continued to grow cereals and pulses. None of the farmers grow cereals alone while 0.8% (1) grow pulses and horticultural crops. Some 14.2% of the respondents grow cereals and horticultural crops while 4.2% grow other combinations of crops (including sugarcane, bananas) (See table 8).

Most farmers (60%) do their farming during the short and long rainy seasons (which fall from mid October to early December and March to May respectively (see Opinya, 1982) while 34.2% do their farming during the dry and rainy seasons. Only 5.8% cultivate during the dry seasons. It could be argued that many respondents do their farming during rainy seasons because of water availability. During this time it is easier to plant different types of crops given that majority (38.3%) plant cereals, pulses and horticultural crops. The few (5.8%) who plant during the dry season are perhaps some landladies and those near water sources such as near riverbanks and the Nairobi dam. Generally, it can be asserted that urban farming is seasonal and not a year-in-year-out activity.

Table 8. Distribution of respondents by crops grown in current garden

Crop	No of respondents (N)	Percentage (%)
Cereals, pulse, horticultural crops	46	38.3
Cereals and pulses	43	35.8
Cereals and horticultural crops	17	14.2
^Horticultural crops	7	5.8
Other crops [sugarcane, .bananas 1	5	4.2
J^ulses and horticultural crops	1	0.8
_Pulses__	1	0.8
[TotaP	**120**	**99.9**

The use of crop yields from the current garden does not differ significantly with the initial purpose of crops grown in the first garden. Thus 60.8% of the respondents grow crops for domestic use while 34.1% grow crops for both sale and household consumption. This implies that the circumstances that forced the respondents to indulge in urban agriculture have not changed and that the struggle for search of food and income continues. The involvement of women in urban cultivation could thus be seen as their response to the failure of wages (either theirs or their husbands') to keep pace with the cost of life in the city.

Study findings show that 60% of the respondents combined shamba work with other forms of employment. Hence urban cultivation is not an - only survival strategy but a way of supplementing household food supply'and income. It is not most likely that urban cultivators would abandon the practice if they got a job or a better paying employment. As Freeman (1991:85) found out, 80% of the urban cultivators planned to continue cultivation even if they got another job. As such, urban cultivation is not a short-term adjustment to the dilapidated urban realities as they await better job prospects, but a along term occupation by women and others in the low-income category of the urban population.

The goal of urban agriculture is supplementary since, first, it is seasonal, secondly, the gardens are too small to support a family throughout the year and lastly, incomes accrued from sale of garden products are modest and cannot meet all household needs considering the high cost of life in the city. See table 9.

Table 9. Distribution of respondents by use of crop yields from current garden.

Use of crops	No of respondent (N)	Percentage (%)
Household consumption	73	60.8
Sale and household use	41	34.2
Sale	5	4.2
Other (for the church)	I	0.8
Total	**120**	**100.0**

When asked to give reasons as to why they continued farming in the city, respondents gave a variety of reasons. About 37% (36.7%) said that urban farming was vital to them because it was a way of supplementing household food supply. This indicates that urban cultivation is not the only source of food supply but a supplement. Thus it is not an only survival strategy but a supplement to survival as far as food is concerned. Some 27.5% of the respondents said that urban cultivation was a way of self-employment in a bid to supplement household 'income either earned by their spouses or accrued from casual labour. Slightly below a quarter (24.2%) purported that it was a way of being occupied and thus did it as a hobby in addition to its food and income benefits. Only 11.7% of the respondents reckoned that urban agriculture was the sole means of food and income. As such, it is the only survival strategy to a very small proportion of the urban women population (See table .10).

Table 10. Distribution of respondents by reason of cultivating in the city

Reasons for cultivating in the city	Number of respondents (N)	Percentage (%)
^Supplement household food supply	44	36.7
Supplement household income	33	27.5
As a hobby (just to be occupied)	29	24.1
^jet food and earn an income	14	11.7
Total	**120**	**100.0**

As evident in Table 10 above, the need to supplement household food supply ranks first in the list of reasons for indulging in urban agriculture. This is followed by the need to supplement household income.

Respondents who sold all or part of their produce were asked to place an estimated cash value on their crops sold. Some 20.2% of the total sample earned upto ksh3000 while 4.2% earned between ksh300l to 6000. Only 9.2% earned above ksh.6000. Such incomes are modest and fall within the low-income bracket. This implies that urban agriculture is only a strategy to top up the food and income requirements of those who indulge in it because the incomes they earn are not adequate to meet their other domestic needs including food requirements. Indeed, even for cultivators who produced a fair proportion of their families' food needs, the household expenditure was significant. Some 45.8% of the respondents spend between kshlOOl to 3000 while 18.3% spend upto kshlOOO. The rest spend more than ksh3000. Only 3.3% of the respondents refused to estimate their household expenditure. By implication, urban cultivation may be seen as a domain of the low-income urban residents and is undertaken largely by women with the aim of supplementing household food supply and income. As Mehra and Buvinic (1990) put it, earnings of women are particularly more important in poor than in better off families. This is because incomes of poor women supplement household incomes while those of the better off women mostly serve to meet luxury needs.

Nevertheless, through an examination of the reasons given by respondents for their •nvolvement in urban cultivation, it is evident that cultivation in the city is a practice occasioned by a few but vital imperatives. The food component aids practitioners in

reducing expenditure on household food needs and hence freeing some cash that would have otherwise been spend on purchase of food.

4.6 Ownership of Garden in Rural Area and Prior Experience in Cultivation

Study findings revealed that 68.3% respondents did not have an operational garden in the rural areas. It may not be that these respondents had no land to cultivate but that there was no one to do farming in the rural areas since most of the women reside in the city with their husbands. Women are known to dominate farm work in the rural areas of Kenya (Masinde 1991) and thus when they migrate into cities, their rural gardens are left with no one to till them. Perhaps this explains why majority of the respondents had no gardens in the rural area considering that 84% of them were migrants into the city.

However, 86.7% of the respondents had prior experience in farming as opposed to only 13.3 who did not have experience prior to their involvement in urban cultivation. Of those who had experience before indulging in urban cultivation, 75.7% (of the total sample) got their experience from their parental homes in the rural area. A small number (3.3%) got this experience from their parental home in the city while 5.8% learnt about farming by either observing other urban cultivators or by doing casual labour in urban farms. Only 1.7% (2) of the respondents got their experience in school. Presumably, these are the young farmers who have gone through the 8-4-4 system of education where agriculture is part of the curriculum.

Given that agriculture is the main stay of many rural communities in Kenya, and that **'5.7%** of the respondent got their farming experience from the rural areas, there is strong ground to term agriculture a rural characteristic.

With 84.2% of the respondents being migrants, then it can be asserted that agriculture in the city is a rural socio-economic and even cultural trait that migrants from the agricultural societies have been unable to abandon. This argument augurs well with the cultural lag theory that migrants may find it easier to drop some socio -cultural traits than it is to wholly abandon some important "rural" economic activities.

4.7 Livestock Rearing in the City

There is not enough land in urban areas to allow for cultivation leave alone animal husbandry. Perhaps this is because, urban areas have not been designed to accommodate agriculture of any magnitude. However, findings of this study revealed that a part from growing a variety of crops, respondents also kept livestock. Thus 27.5% of the respondents kept livestock although the large majority (72.5%) did not rear any. Majority of those who kept livestock reared only chicken (27.4%) while 21.2% reared chicken and goats. A small percentage (18.2%) of the respondents kept goats, sheep or pigs as some 12.0% kept cows, goats, sheep and chicken. A significant minority (6.2%) kept cows only while 2.9% kept pets (dogs and/or cats). Table 10 gives the distribution of respondents by the combination of livestock kept.

Table 11. Distribution of respondents by type of livestock kept

.Type of livestock	No of respondents (N)	Percentage (%)
Chicken	**9**	7.5
Coats and chicken	7	5.8
Coats/sheep/pigs	6	5.0
^ows, goats/sheep/pig	4	3.3
i^vvs, goats/sheep/chicken	4	3.3
.Cows	2	1.7
-Other (jets)	1	0.8
LTotal	**33**	**99.9**

As evident above (Table 10) majority of the respondents did not keep livestock despite the wish to do so. This may be explained by the lack of space for such an activity. However, of those who reared livestock, 48.4% kept them for household consumption and sale, 33.4% kept them for household consumption only, while 15.3% kept them solely for sale. Only one respondent (2.9%) kept livestock as pets.

The foregoing discussion is reminiscent of the purpose of cultivation in the city. That is, the need for food and income is a motivating force towards livestock rearing just as it is the case with crop cultivation. Thus, there is very little room for keeping livestock as pets just as it is less likely for one to indulge in crop cultivation as a hobby.

4.8 Location of Respondents' Initial Gardens in the City.

Majority of the respondents (45%) started cultivation in the city between 1981 and 1990. According to the Mazingira Survey of 1985, 49% of the shambas were found in backyards. Contrary to this assertion, findings of this study indicate that majority of the first garden were located along roads (28.3%) and along rivers (28.3%) with only 15.8% having their gardens in the backyard. The rest of the gardens were located along the rail-line (7.5%) and in open commercial/institutional land (14.2%) with only 2 respondents (1.7%) having the gardens in their employers' compound.

Majority of the respondents acquired their first gardens through 'invading' or 'grabbing' of the land (29.2%) while 25.8% were given such land for free by relatives, friends, landlords or even their employers. Some 18.3% inherited the land from their parents or in-laws while 15.8% and 10.8% rented and purchased the land respectively.

4.9 Relocation of Garden

Due to scarcity of land in the urban area, many respondents 78.3% had not changed site ever since they got their first garden. However, 21.7% relocated their gardens due to a number of reasons. Majority (46.1%) relocated their gardens because the land was repossessed by the owners, 7.8% bought their own land while 30.9% got a bigger and better pieces of land elsewhere. The rest (15.2%) had to abandon the plots because the rental tee was hiked.

From the qualitative data collected in the course of administering the questionnaire, several respondents who were forced to relocate their gardens after the owners repossessed their land, purported that the owners repossessed the land out of malice. They alleged that such landowners were envious of the progress, which the respondents were making. Some landowners rented the land to other cultivators while some even cultivated on the land after repossession.

4.10 Location of Current Gardens and Type of Land Tenure

Majority of the respondents (59.1%) had their gardens located between a few metres upto 500m away from their residence. A significant minority (11.7%) had their farms located from 0.5 km to 1 km while the rest had their gardens far away from their residence with 6.7% having them as far as four (4) kilometres away. This implies that even though majority acquire land near their residential areas, there are those whose desire to farm is not inhibited by lack of a nearby vacant land. Probably, this is due to the fact that the purpose served by the urban garden is so important that time spend to reach the farm is immaterial. However, location of gardens in such far places may be as a result of lack of land near the respondents' residential areas.

Most of the respondents (88.3%) had only one garden while 9.2% had 2 gardens and only 3 respondents (2.5%) had 3 gardens. This indicates that there is very little available space left for farmers to practice shifting cultivation contrary to the assertions by Freeman (1991:93). This perhaps explains why many women farmers practised manuring because of the lack of space to shift to as shall be explained later. The sizes of these gardens varied between less than % an acre to above 2 acres with majority (53.3%) being less than % an acre. Some 28.3% of the gardens were between ^{l}A and Vz an acre while 15.9% were between $V2$ and 2 acres with only 3 respondents (2.5%) owning gardens of more than 2 acres.

Through observation, the researcher noted that the shapes of the garden plots varied considerably. Some were neat rectangles while others were simply irregular shaped patches. Thus estimation of farm sizes should be taken cautiously.

Table 12. Distribution of respondents by distance to their gardens

Distance	**No of respondents**	**Percentage**
Upto 500m	71	59.1
More than 0.5 - 1 km	14	11.7
More than 1 km - 2km	15	5.0
More than 2 km - 3 km	6	5.0
More than 3 km - 4 km	6	5.0
Above 4 km	8	6.7
Total	**120**	**100.0**

The city commission prohibits cultivation by any unauthorised persons of any unenclosed and unoccupied land preserved for any public road (Mazingira, 1987). In addition, developers of urban land must leave a riparian way along drainage lines and natural watercourses. These riparian ways constitute public land yet the city commission outlaws their use. In disregard to by-laws governing use of such

prohibited land, women have established numerous plots of shambas on the same and in other open spaces of all kinds.

Study finding revealed that most respondents (32.5%) had their current gardens located along riverbanks while 22.5% had their gardens along roads. Only 18.3% had their gardens in back yards (inside their residential areas). The rest had their gardens either near Nairobi dam, in institutions/company compound, along railway line, inside their employers' compound or in other open and unused land along footpaths (See table 13).

Nearly half (41.7%) of the respondents were given the land for free by their friends, relatives, landlords or employers. About a third (32.5%) had invaded the land on which their gardens stood while 14.2% had purchased the land. Only 9.1% (11) of the respondents had rented their gardens while the rest (2.5%) had three gardens each and had acquired them through a combination of the above ways (see Table 14).

These findings show that majority of the respondents had to enter into negotiations with friends, relatives, land lords and employers in order to have some farm space in the city. Freeman (1993) argues that in Kenya, women are the majority of rural agricultural labourers and are only allowed user privileges on land owned by someone else. This contention also seems to apply to the status of women in urban agriculture where slightly more than 1/2 (50.8%) of the urban agriculturists cultivate their farms after entering into agreement with someone else as opposed to 32.5% who have invaded the plots on which they farm. Entering into such informal agreement does not, however, legalise the practice of urban cultivation because according to the Nairobi city council public health departments, "crop farming is not allowed within the city

boundaries" (Mwangi, 1995:5). Prohibition of urban cultivation is based on the local government Act, Cap 265, the Public Health Act, Cap 242 and the City of Nairobi By-laws I.N.275/1961, all of which severely restrict cultivation in urban centres (Mazingira, 1987). Of those who had rental land (9.1%), 5.8% (of the total sample) paid between ksh 500 to 1000 per year while 2.5% (3) paid between Ksh. 1001 to 2000. Only one respondent (0.8%) (1) paid above ksh 2000 per year.

Table 13. Distribution of respondents by location of their current gardens

Location of garden	Number of respondents (N)	Percentage
Along a river	39	32.5
Along the road	27	22.5
Inside residential area (backyard)	22	18.3
Along the railway	8	6.7
In a company/NGO land	7	5.8
Institutional compound	6	5.0
Near Nairobi Dam	5	4.2
Other (other open lands)	4	3.3
Inside employers compound	2	1.7
Total	**120**	**100.0**

Table 14: Distribution of respondents by mode of acquiring land on which the current garden stands.

Mode of land acquisition	No of respondents	Percentage
Given for free (by friend, relative, land lord, etc)	50	41.7
Grabbing /invading	39	32.5
Purchased	17	14.2
Renting	11	9.1
Other (combination of above modes)	3	2.5
Total	**100**	**100.0**

Choice of land for cultivation cannot be made without considerations of factors such as terrain and soil quality (fertility) among other factors. Farmers wishing to practice horticulture would most probably consider availability of water among other factors. However, the choice of land for cultivation in the city of Nairobi seems to ignore such

considerations. Study findings indicate that almost half of the respondents (45.8%) located their gardens on the specific areas (shown in Table 13) because the land was idle, available to them and they had no other alternative. More than a quarter (27.5%) of the respondents considered the land as suitable tor cultivation because it was near a water source while only 17.5% chose such sites because the land was fertile and enough for cultivation. Some 9.2% considered security issues and thus cultivated on such land because it was near their residential areas.

The above findings resonate the tact that land is scarce in the city and thus availability or even the need to have a piece surpasses the suitability of such land for agriculture.

4.11 Farm Management and Decision Making'

This section is aimed at exploring the extend to which such cultivators are independent in making decisions regarding farm operations, use of garden produce and appropriation of any income accrued from the sale of crop yield. As already pointed out, women have traditionally been the principal cultivators in rural Kenya. However they have been excluded almost entirely from the land entitlement process and thus decisions on use of such land and appropriation of benefits accruing from it lie with the male heads. Like their rural counterparts women urban cultivators also do most of the farm work.

Decision making in a patrilineal society is usually done by the male heads. However, with the changes occurring in the society giving women a higher status and increasing their say in certain and indeed most matters affecting society, it is not surprising to find, as this study did, that the female is making important decisions pertaining to the search

for a garden, choice of crops to be grown, the use of garden produce and appropriation of income from sale of garden produce.

Responsibility of Looking for Planting Materials (seeds, cuttings, tubers and suckers)

According to the study findings, the onus of looking for planting materials for urban farms lies with women. Findings reveal that 91.7% of the respondents were charged with such a responsibility of looking tor planting materials. Only in 4.2% of the instances were husbands (men) charged with the responsibility while a similar percentage (4.2%) jointly looked for planting materials with their spouses. This further strengthens the assertion that urban farming is an activity dominated and controlled by women right from making arrangements to get a farm to looking for planting materials. Such planting materials include planting seeds (for all cereals and pulses), tubers for potatoes, suckers for bananas and cuttings for sugarcane and cassava. Above three quarters (80.8%) of the respondents asserted that they bought such materials from the local shops while 11.7% preserved planting materials from the previous harvest.

A small number (5.0%) of the respondents bought some and got others from the previous harvest. The rest of the respondents (2.5%) got planting materials from their friends who had plenty.

4.12 Farm Work

Most informal sector enterprises are often run by an individual entrepreneur helped by his or her family or a few employees. Thus, in addition to being charged with the responsibility of looking for planting materials, majority of the women are also the

actual farm workers with 69.2% solely doing planting work. 62.5% solely weeding their farms and 64.2% solely harvesting the crop.

All cultivators found in the shambas were using simple hand tilling equipment such as pangas and hoes. These are relatively inexpensive equipment affordable by the poor urban cultivators. According to Freeman (1991), very few urban farmers own farming equipment and thus borrowing of such equipment is a common practice among farmers. This is a further pointer to the fact that urban farming is a domain of the poor and that it requires less sophisticated farm equipment.

In many farming communities, it was the role of men to do heavy farm work such as bush clearing and burning of heaps of cleared bashes. Preparing the soil for planting, sowing, weeding and harvesting was the work of women and children. Study findings indicate that the specific role of men in this seemingly traditional division of labour has not been carried over into urban farming. Indeed husbands hardly assist their spouses in urban farm work. Thus, only 7.5% of the respondents said they were helped by their husband in planting, while only 0.8% (1) were helped in both weeding and harvesting. The rest of the respondents were assisted by their children and other household members staying with them. In some instances though minimal, respondents hired labour to plant (10%), weed (15%) and harvest (9.2%) their crop.

A relatively higher number of respondents hire labour to weed because weeding is more laborious and cumbersome while a very small percentage (9.2%) hire labour in harvesting because most hired labourers steal foodstuffs from the farms during

harvesting. This was gathered through probing answers provided in the open-ended questions pertaining actual farm work.

Slightly more than 1/3 (34.2%) of the respondents hire labour at some point to do actual farm work. This is because, a part from the labourers being untrustworthy, labour is expensive. According to the study findings, 15% of the respondents spend a minimum of upto Ksh. 1000 per season while 14.2% spend between Ksh. 1000-3000 per season on farm labour. The rest (5%) spend over Ksh. 3000. Given the small acreage of farms and the meagre respondents' incomes per month, such cost of labour is hardly affordable to many of the women urban farmers.

4.13 Decisions Regarding Farm-Work »

Given that majority of the women farmers in the urban area are migrants, then it is expected that they carry with them the skill of tilling land for purposes of food production. Thus it is not surprising to find, as findings of this study show, that women provide over half of the labour force in urban gardens. For many women, urban farming seems to be a lonely activity with over 2/3 (two thirds) doing actual farm work single handedly.

Being the sole labour providers starting from planting, weeding to harvesting, it is expected that women urban cultivators also have a share in deciding who is to do the actual garden work. Findings of this study show that 95% of the respondents are responsible for making decisions on garden work. Only 3.3% of them said that their husbands made decisions regarding garden work with only 1.7% (2) acknowledging shared responsibility with their husbands.

These findings reveal that since most women got their gardens through their own initiative, likewise, they have a responsibility of providing farm labour. Even though farm work may be seen as an additional burden to women, the authority to decide who is to do the work lies with women. As a result, majority have control over their gardening activities in the city. Some of those who had no control of their gardening activities said that they had to consult their husbands since they (husbands) were the household heads. Others asserted that their husbands were more experienced and had to be consulted. Nevertheless, with the elevation of women's status in the society, men no longer hold sole decision-making power.

4.14 Specialised Farm Practices

For purposes of this study, specialised farm practices refer to those activities done on the farm with the aim of improving crop quality or maintaining/improving soil fertility. Such practices include crop rotation, erosion control, irrigation, manuring and pest control. The study revealed that over half of the respondents practised manuring; 47.5% controlled erosion in their farms; 44.2% irrigated their crops while 40.8% at least used a method of pest control. Only 30.8% practised crop rotation.

The reason for minimal crop rotation could be explained by the small size of urban farms and the lack of space to practise shifting cultivation. This lack of space further explains why majority of the respondents practised manuring to improve soil fertility and subsequent crop quality.

Through observation, the researcher established that in most urban gardenscrops were inter-planted. Only in very few instances were kales (sukuma wiki) planed alone in small portions of some gardens. However, it can be asserted that majority of the

respondents applied manure in their gardens because; at least crop remains from previous harvests and weed formed part. Qualitative data collected through informal discussions with respondents shows that some got manure from their friends who kept livestock and needed to dispose dung from their livestock enclosures while others got it from their own livestock. Thus manure is the only free farm input that many urban cultivators have access to. The low percentage of those practising irrigation (44.2%) can undoubtedly be explained by the water shortage in the city. The few who practise farm irrigation are those near water sources such as rivers and the Nairobi dam, and the few landladies who have water at their disposal. Such irrigation is, however, on a small scale and is done by farmers growing horticultural crops such as kales and spinach planted at backyards or along riverbanks and near Nairobi Dam.

Through observation, the researcher established that many of those who irrigated their crops used sewerage water. Indeed, farrows from the open sewerage systems to the gardens were observed in some parts of Kibera (Langata) and Dagorreti Divisions. Qualitative data collected in the course of administering the questionnaire shows that there is increased use of sewerage water during the dry season. This is especially so among farmers who plant kales and tomatoes along Nairobi River.

In support of the use of sewerage water, one respondent alleged that it is the only alternative source of water since landlords cannot allow anyone to use 'their' water for irrigation purposes. In addition, water from the City Council sources is not enough for household use let alone for irrigation. As a result some urban farmers temper with the sewerage pipes in a bid to get the 'dirty' water to irrigate their crops. . .

The use of sewerage water in irrigating crops may expose both the cultivator and the consumers to health risks. Such water emits offensive odours and harbours germs and other disease causing organisms. However, there is no available literature to show that the use of such water in irrigation is harmful. Nevertheless, consuming crops known to have been irrigated with sewerage may be psychologically harmful (Mvena et al, 1991).

Generally, the overall picture is that farmers rely mostly on natural planting/farming conditions since many cannot afford sophisticated cultivation practices such as use of chemical fertilizers, and lack water to irrigate their farms. In addition, the lack of secure land title could explain why most women do very little to improve the soil quality in their farms.

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4.15 The Search for a Garden

As pointed out elsewhere in this chapter, majority of the respondents (67%) use the land with some understanding between them and a second party. About a third (32.5%) use the land without permission from any one ('invading'/'grabbing'). Of those who use the land 'legally' (with some understanding between them and a second party), 56.7% (of the total sample) had made their own arrangements to acquire such land without any assistance from their spouses or friends. Some 5.8% were assisted by their friends while cases of joint efforts (with the husband) constituted only 4.2%.

The finding that about a third of the respondents (32.5%) use the land without any permission is suggestive of the lack of security of tenure among urban cultivators. This may have a bearing on the type of crops grown and on maintenance of the land through

soil conservation practices. Thus, farmers may not be willing to plant fruit trees, which take a longer period to mature since the land may be repossessed without notice.

The above findings reveal that urban cultivation in more than half of the cases (56.7%) is out of the sole initiative of women. They form majority of the unemployed urban population and thus are compelled by circumstances to look for means of supplementing household food and income.

Surprisingly, the percentage of those who had acquired their gardens through 'grabbing' (32.5%) and that of those who got their gardens through their husbands (33.3%) are very similar. Though far fetched, this seems to suggest that 1/3 of the urban gardens are "grabbed" or illegally acquired by men.

In addition, it can be said that women are reluctant to 'grab* land even for purposes of meeting some of their pressing needs such as food and income!

4.16 Choice of Crops to be Grown

Urban agriculture seems to accord women the control they lost as a result of technological changes in agriculture. Boserup 1970 (quoted in Mehra and Buvinic 1990:1) asserts that with introduction of cash crops and the replacement of the hoe by the plough, ploughing (read farming) became the work of men. As a consequence women lost control over farming since they were left behind in the traditional low-yielding subsistence sector. In response to the above situation women cultivators in urban areas have asserted their control over several gardening operations.

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Data collected revealed that 95% of the respondents were the sole decision-makers pertaining to the type of crops grown in their urban gardens each season. Only in 3.3% of the cases were males (husbands) the sole decision-makers. Cases of joint decision making accounted for only 1.7%. This finding is reminiscent of the current trend in the society where authority structure has been revised and women have reasserted themselves in different roles.

4.17 Use of Garden Produce

Women are customarily charged with the responsibility of preparing food for their families (Masinde, 1991). Thus, it is expected that they should be able to plan for the food at their disposal. The findings of this study show that women have an upper hand in making decisions regarding use of garden produce, as this constitutes part of food budgeting. Thus, 94.2% of the respondents said that they solely made decisions regarding use of their garden produce.

As earlier pointed out, most women cultivate in the city with the aim of supplementing their household food and income sources. Thus 42.5% of the respondents sell part of their produce to earn an income with the greater majority 57.5% preserving the total yield for food. Of those who sell part of the yield to earn an income, only 7.8% sell all their farm produce. This translates to only 3.3% of the total sample. The probable implication here is that, in as much as women would like to earn an income through urban cultivation, the desire to supplement household food supply overrides the need for income. This is because, at least 96.7% of the respondents kept either all or part of their produce for food.

4.18 Use of Income from Sale of Garden Produce

Control of income has traditionally been a domain of men (Yunus and Jolis. 1998:96). This is probably because in most developing economies, men dominate the labour-force and are the breadwinners in most patrilineal societies. However findings of this study indicate that control of use of income accrued from the sale of urban garden produce is in the hands of the women. Thus out of 41.7% of the respondents who sold all or part of their garden produce, 95.9% (or 40% of the total sample) have full control on how such income is to be used. The few who had no say over the income said that their husbands were in-charge of the household budgets. Evidence from the study findings is suggestive of women's desire for personal independence. That is, to have something of their own or to gain the satisfaction of having a productive occupation that gives them an income to manage their lives even if modestly. ;

It could then be asserted that urban farming is one way through which women have sought control of finances in the household.

However, given the small size of urban farms, such income is very little although its importance to the low-income households cannot be underestimated. According to the Mazingira Survey of 1985, Nairobi urban farmers made an income of Ksh.262 per season from the sale of farm produce. The median was Ksh.176 and the mode was K.sh.80. The reason for such low farm incomes in the Mazingira report could be attributed to the fact that the study focused more on the backyard gardens, which are usually small plots of sukumawiki (Freeman 1991). However, in the present study, . incomes accrued from the sale of garden produce per season were much higher. Thus, 19.2% of the total sample earned upto Ksh.1500; 10% earned between Ksh.1501 -

3000, 2.5% earned between Ksh.3001 -4500 while 1.7% earned between Ksh.4501 - 6000. Only 8.4% of the respondents earned above Ksh.6000 (approx. US$76).

Given that the minimum wage in Kenya is Ksh.3352.00 (Daily Nation July 25th, 2001), then. out ot the 41.7% ot the respondents who sell all or part ot their crop, over V2 ot them (29.2% of the total sample) earn below the recommended minimum wage in Kenya. Nevertheless, urban agriculture is one way by which women have been emancipated through disposal of garden produce and appropriation of income accrued from sale of such produce.

4.19 Problems Experienced by Urban Farmers

The informal sector has received support from the government however modest. However, the city authorities have not accepted some activities of this sector. The continued destruction of illegal kiosks in certain areas of Nairobi, and incessant arrest of street hawkers is a clear indication of such non-acceptance. The outright lack of government policy guidelines in favour of urban cultivation leaves the practitioners in the dark. In addition the design and planning of urban areas does not leave room for any type of farming and thus farming in such areas is bound to be constrained by problems.

Women urban cultivators are faced with numerous problems in their endeavour to produce food in the open and idle spaces of the city. Near the close of the interview, respondents were asked to mention the main problems they faced. Being an open-ended question, responses were recorded verbatim as respondents mentioned them. As

expected, respondents enumerated several problems. From the mentioned problems, they were asked to single out the major problem they faced.

Study findings indicated that 97.5% of the respondents faced various problems in their farming activities in the city. Majority of the respondents (35%) faced the problem of crop theft and destruction of crops by people and animals. Other problems included lack of capital, inadequate time to do farm work either due to work commitment or household chores, lack of water for irrigation, crop pests and diseases, and lack of enough land/space to farm. The complaint of inadequate farm land could be taken as a pointer to the shortage of farm land in the city and to the women's wish to access more land. Some of the minor problems included soil infertility, erosion, water logging and assault by some youth unknown to the respondents.'

Freeman (1991:98) argues that urban farmers have more than one plot so that if crops in one plot are destroyed, the others escape the attention of the City Askaris. Contrary to this assertion, this study established that majority of the women cultivators had one plot of shamba and that none of the respondents had been harassed by the city council authorities despite the illegal status of farming in the city. This may be construed to mean that destruction of crops by the council has either lessened or ceased thereby leaving farmers confident with one plot of garden. In addition it could mean that, city authorities have stopped harassing the farmers maybe because the practice is one way of maintaining a green city. In addition this may point towards the council's informal realisation that urban cultivation meets some of the needs of women (and the low-income residents) who are faced with a problem of surviving in the city.

The above problems seem to be outweighed by the actual and even perceived gains from urban cultivation. Nevertheless, in the actual enforcement of its by-laws regarding urban farming, the Nairobi City Council is seen to display some level of ambivalence in the sense that even though it outlaws urban cultivation, none of the respondents reported arrest and prosecution for such an 'offence'. Certainly, this explains why a casual visit to almost any part of Nairobi during the rainy season reveals numerous plots of shambas with healthy crops without any attempt by the owners to conceal them. Although this may be viewed as a failure on the side of the City Council in enforcing its by-laws, it is this loophole that women urban cultivators are seen to exploit.

A part from the problems specifically mentioned by;the respondents, there are those environmental -related problems, which urban farmers face although they may not be aware. For example, the use of sewerage water (and water from Nairobi dam and Nairobi river) to irrigate horticultural crops such as kales, tomatoes and potatoes poses a great health hazard to the urban farmers (as consumers) and to other consumers of their crop. Indeed, handling of such water may cause water borne diseases to the farmers.

In addition, farmers cultivating along roads risk consuming lead-contaminated foods as a result of exhaust -fumes from motor vehicles. They also risk being knocked down by vehicles and even their crops being destroyed. In the course of the survey, the researcher observed that some crops growing along roads (especially maize) were pale yellow, stunted and had soot on the leaves. Perhaps this could be due to the exhaust fumes from motor vehicles or the poor aeration of such land, which was compacted

during construction of the roads. Table 15 gives the distribution of respondents by major problem experienced.

Table 15: Distribution of respondents by type of major problem experienced

Problem	Number of respondents	Percentage (%)
Theft and destruction of crops	42	35.0
Lack of capital	22	18.3
Lack of enough farm land	14	11.7
Crop pests and diseases	13	10.8
Lack of time	9	7.5
Lack of water for irrigation	9	7.5
Other (children not assisting)	8	6.7
None	3	2.5
Total	**120**	**100.0**

A close scrutiny of the above problems shows that majority are common problems to farmers even in the countryside. Seemingly, the only problem unique to urban farming is theft and destruction of crops by people (and animals). In addition, these problems are common to urban farmers in general and not unique to women farmers. Nevertheless, 5.8% of the respondents singled out molesting by young men as a problem specific to women urban farmers. Qualitative data collected in the course of the interviews revealed that some women had been raped while doing garden work, while others were generally molested (abused and ridiculed) by some young men unknown to them.

4.20 Agricultural Extension Services

Nairobi is the headquarter of all ministries in the country including the Ministry of Agriculture. It is therefore expected that urban farmers in Nairobi can easily access agricultural extension services.

Surprisingly, study findings showed that 82.5% of the respondents never received extension services since they started cultivating in the city. Of those who had received

such services, 4.2% of the total sample were attended to a year preceding the study, three (3) respondents (2.5% of the total sample) received services 3-4 years preceding the study while 10.8% were attended to over four years preceding the study.

Through probing of answers provided by respondents regarding assistance from agricultural extension officers, the researcher established that farmers were only assisted when they persistently reported a problem at the ministry's headquarters. Such assistance is only in form of advisory services regarding either, the type of pesticides to use on a certain crop pest or type of crops that can thrive in certain soil types. These findings show that urban farming has been given minimal attention by the Ministry of agriculture. This is despite the contribution it makes to the countries GDP growth. According to the Mazingira Survey of 1985,isales from urban agricultural produce amounted to Ksh.60.9 million at the time of the survey. Even with this considerable contribution to Kenya's GDP, the Ministry of agriculture is not seen to promote the practice.

The adoption of either a wholly negative attitude or ignorance towards urban agriculture is like ignoring the potential importance of the income and food from this informal sector activity. It is through the lack of agricultural extension services that the potential of urban agriculture seems to be unappreciated by the government and hence, largely untapped.

4.21 Farmers' Suggestions Towards Alleviating the Problems they Face

In order to alleviate the problems that urban farmers face, respondents made several suggestions. Slightly more than a third of the respondents (36.7%) asserted that the

Ministry of Agriculture should send agricultural extension officers to the field to advice farmers on farming techniques that would boost their produce. Some 25.8% suggested that since many women farm in fear, the government should allocate them the vacant pieces of land so as to cultivate without fear of losing their crops. Others (25%) made pleas to the government, the Ministry of Agriculture and even NGO's to either assist farmers with farm inputs (such as fertilisers, water, pesticides, and certified seeds) or reduce prices of such inputs. The rest requested assistance in rehabilitating water logged areas (0.8%) and security for their crops (3.3%). A tew of the respondents (8.3%), however, did not have any suggestions as to what type of assistance they needed.

CHAPTER FIVE

DATA ANALYSIS

This chapter deals with the analysis of the relationships between the dependent and independent variables. Specifically there is an attempt to show the nature of relationships between the degree of involvement in urban agriculture, and socio-economic status and age of women urban cultivators. Further, there is an attempt to show the relationship between land ownership and the physical distribution of gardens in the city of Nairobi. All this is done through testing of hypotheses and interpretation of findings using simple and advanced statistical techniques.

5.1 The Influence of Socio Economic Status on Women's Degree of Involvement in Urban Agriculture

The first hypothesis of this study was that the socio economic status of cultivators influences their degree of involvement in urban agriculture. This hypothesis was analyzed by looking at the socio economic status factors of occupation, income and level of education. Generally, individuals (and families) have either high or low socio-economic status. Some of the factors that account for these differences include educational level, occupation and income (Ezewu, 1983). Differences in socio-economic characteristics, to a large extent, influence the attitudes and values in life predominant in individuals and families. In turn, these may affect the choice of means of livelihood.

Relationship between Making Arrangements for Acquisition of a Farm Plot (Garden) and Occupation

Occupation is an important variable when measuring people's socio-economic status. Holding other factors constant, a person without an occupation is most likely to have a low socio economic status in the modern society while a professional worker has a higher socio- economic status than a casual laborer. People with higher socio-economic status have more bargaining power for acquisition of property than the rest since, among other reasons, they can afford what they negotiate for. In essence, they have more influence in negotiations than those with low socio-economic status. In this study, respondents were categorized into professional workers, casual labourers and the unemployed. Land ladies were classified as professional workers because they could not rightly fit in the description of casual workers nor could they be said to be unemployed. Besides, their income level is high. It was hypothesized that occupation influences the degree of involvement in urban agriculture. Making arrangements for acquisition of a farm plot was taken as an indicator of involvement. (See table 16 below).

Table 16. The relationship between making arrangements for acquisition of a farm plot and occupation

Occupation	**Who made arrangements for land acquisition**		**Total**
	Self	**Other** (husband, friend, relative)	
unemployed	23 (33.3%)	25 (49.0%)	**48** (40.0%)
casual laborer	40 (58.0%)	15 (29.4%)	**55** (45.8%)
Professional worker	6 (8.7%)	11 (21.6%)	17(14.2%)
Total	**69 (57.5%)**	**51 (42.5%)**	**120** (100%)

X^2 =10.453; df= 2; significance = 0.005; C = 0.283

The relationship between making arrangements for acquisition of a farm plot and occupation is significant at 0.005. However, the contingency coefficient (c) value of 0.283 is indicative of a low degree of association between the two variables. Table 16 above also shows that casual labourers are more likely to take self initiatives to acquire a garden in the city than is the case for the unemployed and professional workers. Thus while only 8.7% and 33.3% of the professional workers and the unemployed respectively made self initiatives to acquire a garden, a remarkable 58.0% of the casual labourers made self-initiatives to acquire a garden. On the other hand a higher percentage of the unemployed (49.0%) used other people to acquire a garden. Generally, the findings show that those with low status occupations (the unemployed, 33.3% and casual labourers, 58.0%) are more likely to take self- initiatives to acquire a garden in the city than those with high status occupations [professional workers (8.7%)].

The Relationship between Execution of Agricultural Practices and Occupation

In this study, agricultural practices refer to those basic activities that constitute farm work. These include planting, weeding, and harvesting. Specialized farm practices such as crop rotation, erosion control, irrigation, manuring and pest control are also agricultural practices but have not been used in testing of hypothesis. This is because, without their execution, farming can still be done.

As pointed out in chapter four, most informal sector enterprises are often run by an individual entrepreneur helped by family members or a few employees. If such entrepreneurs are involved in other forms of employment, they may not fully be ^sponsible for running their enterprises. The hypothesis that occupation influences the

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As pointed out in chapter four, most informal sector enterprises are often run by an individual entrepreneur helped by family members or a few employees. If such entrepreneurs are involved in other forms of employment, they may not fully be responsible for running their enterprises. The hypothesis that occupation influences the

degree of involvement in urban agriculture was also tested by analyzing the relationship between execution of agricultural practices and occupation. See tables 17-19 below.

Table 17. The relationship between planting and occupation

Occupation	**Planting**		**Total**
	Self	**Other** (husband, friend, relative, hired labour)	
Unemployed	36 (43.4%)	12(32.4%)	48 (40.0%)
Casual labourer	39 (47.0 %)	16(43.3%)	55 (45.8%)
Professional worker	8 (9.6%)	8 (24.3%)	17(14.2%)
Total	**83 (69.2%)**	37 **(30.8%)**	120 (100%)

$X^2 = 4.740$; df= 2; Significance = 0.093; c = 0.195

Data presented in table 17 above shows that the proportion of farmers doing actual planting without engaging the services of other people was higher among the casual laborers (47.0%), than among those unemployed (43.4%) and the professional workers (9.6%). In addition a higher proportion of farmers prefer to do actual planting (69.2%) instead of engaging others to do it (30.8%). It is also clear that the proportion of farmers doing actual planting is higher among the unemployed and casual laborers than that of professional workers. This confirms the earlier assertion that urban agriculture is a domain of the unemployed and those in low status occupations with low income levels. However, the relationship between planting and occupation was found to be statistically significant only at 0.093 level. Thus, occupation was not found to have a significant influence on doing actual planting. Furthermore, the association between the dependant and independent variables was found to be negligible as indicated by a small contingency coefficient value ofO.195

The small contingency coefficient value is suggestive of the presence of other factors other than occupation that influence farmers' involvement in doing actual planting. It

was established, tor instance that farmers were concerned about destruction and theft of their crop during weeding and harvesting respectively. Since planting has no direct relation with crop destruction and theft, this may explain why quite a significant proportion of farmers (30.8%) engage other people to do actual planting. Table 18 below shows the relationship between weeding and occupation.

Table 18: The Relationship between Weeding and Occupation.

Occupation	**Weeding**		**Total**
	Self	**Other** (husband, friend, relative, hired labour)	
Unemployed	34 (45.3%)	14(31.1%)	48 (40.0%)
Casual labourer	36 (48%)	19(42.2%)	55(45.8%)
Professional worker	5 (6.7%)	12(26.7%)	17(14.2%)
Total	75 (62.5%)	45(37.5%)	**120 (100%)**

X^2 = 9.568; df= 2; significance 0.008; c= 0.272

Weeding is a time-consuming agricultural practice and needs to be done thoroughly since the presence of weeds affect crop yield. Care is also needed during weeding to guard against crop destruction. On the strength of this assertion, occupation was expected to influence farmers' decisions in doing actual weeding.

Data on table 18 above shows that the proportion of farmers who did actual weeding in person was higher among the unemployed (45.3%) and the casual workers (48.0%) than among professional category (6.7%). An explanation for this trend could be that the unemployed and causal laborers have more time to dedicate to weeding than professional workers. In addition, professional workers are likely to have extra disposable income to pay for weeding while the others do not have. The association between weeding and occupation was found to be statistically significant at 0.008 level of significance. A contingency coefficient value of 0.272 is, however, indicative of a

fairly modest association between the dependent and independent variables. Table 19 below shows the relationship between harvesting and occupation.

Table 19. The relationship between harvesting and occupation

Occupation	**Who does actual harvesting**		**Total**
	Self	**Other** (husband, friend, relative, hired labour)	
Unemployed	33 (42.9%)	15 (34.9%)	48 (40.0%)
Casual labourer	38 (49.3%)	17(39.5%)	55 (45.8%)
Professional worker	6 (7.8%)	11 (25.6%)	17(14.2%)
Total	77 **(64.2%)**	**43 (35.8%)**	**120 (100%)**

X^2 = 7.182; df= 2; significance = 0.028; c= 0.238

The harvesting period has been singled out as a period when urban farmers lose their crops through theft. The proportion of the unemployed and casual laborers doing harvesting in person is much higher than that of the same occupational categories engaging others to do harvesting. Conversely, the proportion of professional workers doing harvesting in person (7.8%) is lower than that of the same occupational category engaging others to do harvesting. Data from table 19 shows that there is a significant relationship between harvesting and occupation. This was confirmed by a chi-square value of 7.182 at 0.028 level of significance.

However, this relationship is fairly weak as indicated by a small contingency coefficient value of 0.238. The small contingency coefficient value is indicative of the presence of other factors that may have influence on the farmers' decision to do harvesting in person. For example, the size of the garden, and the number of gardens one has could have influenced the farmers' decisions to do harvesting in person with those having 'large or more than one garden preferring to seek alternative or supplementary sources of labor.

The Relationship between Execution of Agricultural Practices and Income

Income is a key variable in measuring socio-economic status. In this study, income was measured in terms of monthly earnings per person in Kenya shillings (KSh) as reported by the respondents. For the purposes of data analysis, the variable was categorized into low and high income levels. An assumption was made that without an income, life would be absolutely unbearable in the city where all services and commodities are for sale. Thus, even those who 'claimed' to have no source of income were classified as having low income levels. Specifically, those earning up to KShs 4,500 were classified as having low income while those earning above KShs 4,500 were classified as having high income levels. It was expected that a higher proportion of farmers with relatively high income levels would afford to hire labor to do farm work as opposed to those with low income levels. This study hypothesized that income influences the degree of involvement in urban agriculture where doing actual planting in person, weeding and harvesting were chosen as indicators of the dependent variable. See tables 20-22 below.

Table 20. The relationship between planting and income

Income	**Who does actual planting**		**Total**
	Self	**Other** (husband, friend, relative, hired labour)	
Low	45 (54.2%)	8(21.6%)	53 (44.2%)
High	38 (45.8%)	29 (78.4%)	67(55.8%)
Total	**83 (69.2%)**	**37 (30.8%)**	**120 (100%)**

X^2= 11.026; df= 1; Significance = 0.001; C = 0.291

The relationship between doing actual planting in person and income is significant at 0.001 level. Besides, table 20 above shows that a high proportion of farmers with high income levels (78.4%) engaged other people to do actual planting while a high proportion of those with low income levels (54.2%) did planting in person. However, a contingency coefficient value of 0.291 is indicative of a modest association between the

two variables. This shows that there could be other intervening variables such as size and number of gardens a farmer has that may have influence on the relationship between the two variables. Farmers with relatively large or many gardens may opt to engage other people to do planting regardless of their income levels.

Table 21. The relationship between weeding and income

Income	**Who does actual weeding**		**Total**
	Self	**Other** (husband, friend, relative, hired labour)	
Low	44(58.7%)	9(20.0%)	53(44.2%)
High	31(41.3%)	36(80.0%)	67(55.8%)
Total	**75 (62.5%)**	**45(37.5%)**	**120(100%)**

X^2 = 17.052; df= 1; significance = 0.000; C= 0.353

As table 21 above shows, the highest proportion of farmers who engaged other people to do weeding (80.0%) was among those with high income levels while the lowest proportion (20.0%) was among those with low income levels. Conversely, the highest proportion of those who did weeding in person (58.7%) was among the low income group and lowest (41.3%) among the high income category. In essence, farmers with high income levels are more likely to hire labor to do weeding in their farms than those with low income levels. A chi-square value of 17.052 is remarkably significant at 0.000 level of significance. A contingency coefficient value of 0.353 is a further confirmation of the presence of association between the independent and dependent variables.

Table 22. The relationship between harvesting and income

Income	**Who does actual harvesting**		**Total**
	Self	**Other** (husband, friend, relative, hired labour)	
Low	44 (57.1%)	9(20.9%)	53(44.2%)
High	33(42.9%)	34(79.1%)	67(55.8%)
Total	77 **(64.2%)**	**43(35.8%)**	**120(100%)**

X^2= 14.673; df= 1; Significance = 0.000; c = 0.330

Table 22 above shows that a large proportion of farmers with high income levels (79.1%) engaged other people to do harvesting as opposed to those with low income levels (20.9%). In addition, a higher proportion of farmers with low incomes (57.1%) did harvesting in person as opposed to those with high income levels (42.9%). The association between the independent and dependent variables is significant at 0.000 level of significance. Besides, a contingency coefficient value of 0.330 indicates a fairly strong association between the two variables.

It could be asserted that, holding other factors constant, farmers with high incomes are in a position to hire labor for farm work than those with low income levels. Nevertheless, the data still confirms earlier assertions that a high proportion of urban farmers prefer to do harvesting themselves (64.2%) to safeguard against crop theft during harvesting.

Relationship between the number of gardens a farmer has in the city and income

The scarcity of vacant land in the city creates a situation where the demand is more than the supply. This scenario gives those with high income levels an advantage over those with low income levels. Given the proliferation of gardens in the city, this study

hypothesized that income influences the number of gardens an urban farmer owns. See table 23 below.

Table 23. The relationship between the number of gardens a farmer has in the city and income

Income	Number of gardens in the city		Total
	One	More than one	
Low	45 (42.5%)	8(57.1%)	53(44.2%)
High	61(57.5%)	6(42.9%)	67(55.8%)
Total	**106 (88.3%)**	**14(11.7%)**	**120(100%)**

X^2= 1.082; df= 1; Significance = 0.298; C= 0.095

Table 23 above shows that a high proportion of urban farmers (88.3%) has only one garden. In addition, a relatively high percentage of low income earners (57.1%) have more than one garden compared to 42.9% of the high income earners. Conversely, a large proportion of farmers with high income levels has only one garden (57.5%) compared to 42.5% among those with low income levels. This may be interpreted to mean that the low income earners have more gardens so as to produce enough yield for food and sale. On the other hand a large proportion of high income earners may be contented with one garden since they have incomes that can cater for other domestic needs and may not rely on the urban garden as a source of income.

The anticipated relationship between the number of gardens a farmer owns in the city and income was found to be statistically significant only at 0.298 level. Thus, the level of income was not found to have a significant influence on the number of gardens an urban farmer owns. Further more, the association between the independent and dependent variables was also found to be negligible as indicated by a small contingercy coefficient value 0.095. The small contingency coefficient value shows that there are

other factors other than income that influence the number of gardens an urban farmer owns. For instance, it was found out that only 15.8% and 10.8% of the urban farmers had rented and purchased the land respectively. The rest (73.4%) had either "grabbed" the land or were given for tree by relatives, friends. Land Lords or employers. Apparently, availability of vacant land for "invading" and familiarity with people who could give out their land for free could be some of the factors that weakened the relationship between income and the number of gardens an urban farmer owned.

The relationship between number of gardens and level of education

A part from providing basic literacy, education provides higher level training necessary for making informed decisions and advances in every aspect of life. In addition, it plays a key role in the choice of jobs to be done which in turn have an influence on ones income level. In this study, education was expected to influence the number of gardens an urban farmer owned. Since urban agriculture is an informal sector activity mostly done by the lowly educated, it was expected that those with low levels of education were more likely to have more gardens in order to boost their income levels and also provide food for subsistence in their homes. See table 24 below.

Table 24: The relationship between number of gardens in the city and education

Level of education	**Number of gardens in the city**		**Total**
	One	**More than one**	
None	26 (24.5%)	8(57.1%)	34(28.3%)
Primarv	53(50.0%)	4(28.6%)	57(47.5%)
Secondary and above	27(25.5%)	2(14.3%)	29(24.2%)
Total	**106(88.3%)**	**14(11.7%)**	**120(100%)**

X^2 = 6.479; df= 2; significance = 0.039; C=0.226

It is clear from Table 24 above that the proportion of farmers with more than one garden increases with a decrease in education. The proportion of farmers with more than one garden was highest among those who had no formal education (57.1%) while it was lowest among those with secondary level of education and above (14.3%). It could be asserted that those with no formal education had more than one garden as a way of ensuring that they had enough food for domestic use and sale. Those with higher levels of education form the bulk of professional workers with an income to sustain their families and as such may not need many gardens to produce crop for sale. Besides, as already pointed out, urban agriculture is a supplementary survival strategy in the city. A chi-square value of 6.479 at 0.039 level of significance is statistically significant because it is higher than the 0.05 level set for this study.

5.2 The Relationship Between Farmer's Age and the Degree of Involvement in Urban Agriculture

Urban agriculture in Nairobi, as elsewhere in Third World Countries, is largely on small scale and unmechanized. Cultivation practices mentioned by urban farmers are very basic and dependent on hand labour with only a few simple and inexpensive tools. Freeman, (1991: 92) notes that 'the universal' farming implements in the city are the panga (a study bush knife) and the Jembe (hoe). The use of these simple farming implements calls for the use of physical energy. On the basis of this assumption, this study hypothesized that age influences a farmer's degree of involvement in urban agriculture. In testing this hypothesis, agricultural practices that required the use of physical energy such as planting, weeding and harvesting were used as indicators of the dependent variable. Tables 25-27 present the findings on the relationship between these three basic agricultural practices and age.

Table 22. The relationship between harvesting and income

Age	Who does actual planting		Total
	Self	**Other** (husband, friend, relative, hired labour)	
Young (20-30 years)	16(19.3%)	2(5.4%)	18(15.0%)
Middle aged (31-50 yrs)	46(55.4%)	22(59.5%)	68(56.7%)
Old (above 50 years)	21(25.3%)	13(35.1%)	34(28.3%)
Total	**83(69.2%)**	**37(30.8%)**	**120(100%)**

X^2= 4.230, df=2; significance = 0.121, C = 0.185

Table 25 above shows that a higher proportion of the middle aged (59.5%) and the old (35.1%) engaged other people to do actual planting than the proportion of those who did planting in person in the same age categories. Conversely, the proportion of those who engaged ot.iers to do actual planting was lowest in the 'Young' age category (5.4%) than that of those who did planting in person in the same age category (19.3%). Strikingly, the percentage difference between those who engaged others to do planting and that of those who did planting in person in the category of the old (above 50 years) was much higher than the percentage difference in the middle age category.

Despite the above anticipated trend, the relationship between planting and age was found to be statistically significant only at 0.121 level. Thus age was not found to have a significant influence on doing actual planting. The association between the independent and dependent variable was also found to be negligible as indicated by a small contingency coefficient value of0.185. This is suggestive of the presence of other factors other than age that influence the farmers' decision on who does actual planting. It should be noted that farmers did not anticipate crop loss through destruction and theft during planting as was the case during weeding and harvesting respectively. Thus farmers may be satisfied engaging other people to do actual planting. This could be a

possible factor that weakened the relationship between the independent and dependent variables.

Table 26. The relationship between weeding and age

Age	Who does actual weeding		Total
	Self	**Others** (husband, friend, relative, hired labour)	
Young (20-30 years)	16(21.3%)	2(4.4%)	18(15.0%)
Middle aged(31-50yrs)	41(54.7%)	27(60.0%)	68(56.7%)
Old (above 50 years	18(24.0%)	16(35.6%)	34(28.3%)
Total	**75(62.5%)**	**45(37.5%)**	**120(100.0%)**

X^2= 6.815; df=2; significance = 0.033; C = 0.232

Data presented in table 26 above shows that a higher proportion of farmers in the middle aged category (60.0%) and the category of the old (above 50 years) (35.6%) engaged other people to do actual weeding than that of those who did weeding in person in the same age categories. Conversely, the proportion of those who engaged other's to do weeding was lower in the young age category (4.4%) than that of those who did weeding in person in the same age category (21.3%). Thus, the relatively middle aged and relatively older (above 50 yrs) farmers are more likely to engage other people to do weeding than it is the case for the relatively young women farmers (20-30 years). Indeed, weeding is a laborious farm activity that the aged may not easily cope with.

The relationship between doing actual weeding and age was statistically significant at 0.033 level. However, a small contingency coefficient value of 0.232 shows a fairly weak association between the two variables. This is indicative of the presence of intervening variables that weakened the association. For instance, hiring labour needs

financing which, many urban farmers may not afford. Thus income may be one factor that weakened the association between the dependent and independent variables.

Table 27. The relationship between harvesting and age

Age	**Who does actual harvesting**		**Total**
	Self	**Others** (husband, friend, relative, hired labour)	
Young (20-30yrs)	17(22.1%)	1(2.3%)	18(15.0%)
Middle aged(3 l-50yrs)	42(54.5%)	26(60.5%)	68(56.7%)
Old (above 50 years)	18(23.4%)	16(37.2%)	34(28.3%)
Total	**77(64.2%)**	**43(35.8%)**	**120(100%)**

X^2= 9.211; df= 2; Significance = 0.010; C = 0.267

The findings presented in table 27 above could be interpreted in two ways. First, a high percentage of urban farmers prefer to harvest their crop in person (64.2%). This may be seen as a way of safeguarding against crop theft by those doing actual harvesting. Secondly, it is evident that a high percentage of the middle aged farmers (60.5%) and the "old" farmers (37.2%) engage other people to do harvesting as opposed to 54.5% and 23.4% of the same age categories respectively who do harvesting in person. Conversely, the percentage engaging others to do harvesting is lowest in the "Young" age category (2.3%). Evidently, the percentage difference between those who engage others to harvest their crop and those who harvest in person is highest in the Young age category and lowest in the other age categories. Thus, the relatively young farmers (who are supposedly endowed with more physical energy than the aged) are more likely to harvest their crop in person than the relatively middle aged and old urban farmers. Besides, the relationship between harvesting and age was statistically significant at 0.010 level. A contingency coefficient value of 0.267 is also indicative of a fairly strong association between the two variables.

5.3 Relationship Between the Physical Distribution of Gardens in the City and Land Ownership Status

There are few areas of the City of Nairobi where the activities of urban formers cannot be observed, even in the very heart of the Central Business District. Clearly, however, some areas of the city enjoy conditions that are more conducive to urban cultivation than others. For example, some have more favourable mix of soil type; others are near water sources while others have considerable sizes of vacant land tempting to the urban farmer (Freeman, 1991).

Several studies on urban agriculture document that urban farms are located along streams, drainage and sewerage systems, rail lines, roads, on vacant industrial and housing plots, at house backyards and other unused public and private spaces (Rakodi, 1988; Mvena et al, 1991; Obara, 1988; Maxwell, 1990). Taking ones residence as a reference point, this study set out to establish the ownership status of the farm plots with respect to where they are located. Specifically, the study hypothesized that the land ownership status influences the physical distribution of the gardens in the city of Nairobi. Land ownership status was categorized into permanent and temporary ownership. Permanent ownership of land is by way of purchase or inheritance while temporary ownership is either by renting, 'grabbing' (invading) or being allowed to use it for free by the owner.

It was expected that those who had their gardens located near their residence were more likely to have permanent land ownership status of such land than those who had their gardens far away from their residence. This anticipated relationship between land

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It was expected that those who had their gardens located near their residence were more likely to have permanent land ownership status of such land than those who had their gardens far away from their residence. This anticipated relationship between land

ownership status and location of gardens in the city (with respect to distances) was confirmed by study findings as presented in table 28 below.

Table 28. The relationship between location of garden and land ownership status

Land ownership status	Location of Garden		
	Near residence	**Far from residence**	**Total**
Permanent	22(31.0%)	7((14.3%)	29(24.2%)
Temporary	49(69.0%)	42(85.7%)	91(75.8%)
Total	**71(59.2%)**	**49(40.8%)**	**120(100%)**

$X^2 = 4.412$; df = 1; significance = 0.036; C = 0.188.

It is quite clear from table 28 above that there are fairly distinctive variations in the re.ationship between location of ones urban garden and land ownership status. While majority of those who owned their land permanently had their gardens near their residence (31.0%), the highest proportion of those who owned land temporarily had their gardens located far away from their residence (85.7%).

The anticipated relationship between location of urban gardens and land ownership status was confirmed by a chi-square value of 4.412 that is significant at 0.036 level. There is, however, a fairly modest association between the two variables as attested by a contingency coefficient value (C) of 0.188. This is suggestive of the presence of other intervening variable (s) which may have weakened the association. For instance, it is instructive that choice of land for cultivation in the city overlooks considerations of soil quality and terrain as reported by respondents. This is because of the scarcity of vacant land in the city coupled with the fact that no land has officially been set aside for farming. Indeed, almost half of the respondents (45.8%) located their gardens on the specific areas (shown in table 13) because the land was idle, available to them and they

had no other alternative. In addition, 32.5% of the respondents had invaded the plots on which they farmed. Thus, whether or not such land is permanently or temporarily owned, the lack of an alternative piece of land could explain why some farmers may not have a choice regarding location of their gardens with respect to distance from their residence. In essence, the scarcity of vacant land in the city may be one factor that weakened the association between the location of gardens and land ownership status.

This chapter set out to provide an understanding of the relationship between women's degree of involvement in urban agriculture and the socio-economic status factors of occupation, income and level of education. In addition, attempts have been made to explain the relationship between the age of women urban cultivators and their degree of involvement in urban agriculture. The chapter also provides insights into the relationship between location of gardens with respect to ones residence in the city and land ownership status.

Study findings confirmed the presence of significant relationships between women's degree of involvement in urban agriculture and the socio-economic status factors. Cross tabulation of indicators of the degree of involvement in urban agriculture and indicators of socio-economic status revealed the presence of a fairly strong relationship between the variables. Equally, the study found a significant relationship between the age of women urban cultivators and their degree of involvement in urban agriculture. Likewise, a significant relationship between location of ones garden (with respect to residence in the city) and land ownership status was established.

It should however be noted that, an insignificant relationship was noted between occupation, age and planting. This could be explained by the fact that farmers did not anticipate crop loss through destruction and theft during planting. As a result, slightly below a third (30.8%) of farmers from all age and occupation categories were satisfied engaging other people to do actual planting.

Likewise, an insignificant relationship between income and the number of gardens owned by an individual farmer in the city was also established. Indeed, 88.3% of the respondents reported that they owned only one garden. This could be explained by the fact that land is scarce in the city. Thus, whether or not a farmer can afford to rent or purchase land, scarcity of such land is a limiting factor. Besides, a significant percentage of farmers (41.7%) were given their farm plots for free by friends, relatives or landlords.

Generally, the three study hypotheses were confirmed. However, with respect to involvement in actual planting, occupation and age were found to be less important factors while income was a less important factor with regards to the number of gardens an urban farmer owned.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter has three aims. First, it recapitulates the major findings of the study and draws conclusions. Secondly, it provides some policy suggestions in light of the study findings. Lastly, it gives some suggestions on possible areas for further research.

6.1 Summary and Conclusions

In this study, attempts have been made to explore the motivational factors to women's involvement in urban agriculture. In particular, attempts have been made to show the relationship between socio-economic status factors and women's involvement in urban agriculture. The relationship between the degree of involvement in urban agriculture and age has also been explored. Attempts have also been made to show the relationship between land ownership status and location of gardens with respect to ones place of residence in the city. To this effect, three hypotheses were tested using data obtained from a sample of women urban cultivators.

One of the major findings of the study is that the indicators of socio-economic status such as occupation, income and level of education are major factors that explain women's involvement in urban agriculture. In addition, age is a crucial factor since majority of the women urban cultivators are relatively middle-aged (31-50 years). Importantly, a significant relationship was established between the land ownership status and the location of urban gardens with respect to ones place of residence in the city. Thus, majority of those who had permanent ownership of land (on which they farmed) had their gardens located near their place of residence (31.0%) as opposed to

85.7% who had temporary ownership of the land and had their gardens far away from their residence.

Clearly study findings show that, urban agriculture is mostly practised by low-income urban women who are mostly middle aged and who could be said to be in the physically active category. Majority of these women are married, have modest education and their desire to farm in the city is driven by the need to supplement household food supply and income source. This is largely due to the fact that majority are either unemployed or in the low-income formal and informal jobs. As a result their wages and that of their spouses cannot meet all their household needs. Thus to them, urban farming seems to be an industry that provides them with food and sure but modest incomes. ;

To a large degree agriculture in the city of Nairobi is seasonal. However, considering that some women started farming before 1970 (with a majority commencing cultivation in the 1980s), it could be asserted that urban cultivation seems to be a long-term economic activity for those who enter the field.

Majority of the women in the sample had an agricultural base from the rural areas. Thus after migrating into the city they carried with them the skill of tilling land for purposes of food production. Confronted with stiff competition for job opportunities in the urban area, these migrants established gardens in virtually any type of open spaces in the city. Majority of these gardens were small irregular shaped patches with a mixture of food crops and located along riverbanks upto 500m away from the owner's residence.

In most communities in Kenya, women do not inherit and many do not own land. They are only accorded user status on such land. This phenomenon is also seen in urban cultivation where over half of the women cultivators have entered into an agreement with the landowners while a significant minority (32.5%) have invaded it. Specifically 83.3% of the women cultivators do not own the land on which they cultivate.

Majority of the urban cultivators have control over their gardening activities, the use of food and appropriation of income accrued from the sale of crops. Thus, urban agriculture could be seen as a demonstration by women of their endeavour to attain some level of economic emancipation. Food produced and consumed within the urban family substitutes directly for money spent on food and frees up money that is spend otherwise. Thus through urban farming, women are seen to contribute significantly to the upkeep of their urban families.

Even though urban cultivation is a vital undertaking to women and contributes greatly to the country's GDP growth (Mazingira, 1987) the legal framework by the Nairobi City Council does not support it. Indeed the Government (through the Ministry of Agriculture) does not recognise its existence as part of the informal sector. As a consequence there is very minimal support to urban farmers, if any. The study's finding that almost all urban cultivators do not receive agricultural extension services from the Ministry substantiates this assertion.

Urban farming in Nairobi is faced with several problems. Some of these are common even in rural agriculture. However, theft of crops by people is unique to urban

cultivation. Other problems facing urban agriculture include lack of enough farmland, pests and diseases, lack of time to do farm work, lack of capital (credit), and lack of water for irrigation. In spite of these problems, urban agriculture has survived.

The lack of cases of arrest and prosecution of cultivators by the city authorities seems to give urban agriculture a quasi -legal status. Perhaps it is a realisation on the part of the city commission and the government that it is better to deal with the circumstances that leads people to urban cultivation other than dealing with the phenomenon directly. This could be a quiet socio-political transformation of this informal sector activity.

The fact that women are involved in the practice of tilling urban land to produce food, it could be said that they have a role in the overall urban land use. This is because, urban agriculture puts idle and wasteland into productive use and maintains the city environment green and clean (free of weeds) at low or no cost. This constructive role in maintenance of the urban environment cannot be ignored. Indeed it qualifies to be a sustainable development activity or an environmentally friendly industry which is not given due attention by both the government and urban planners. Its potential in beautifying the city as it brings green order to disorderly places at low cost cannot be ignored.

Since urban agriculture is practised by both employed women (46.7%), landladies (12.5%) and the unemployed (40.8%) it is possible to conclude that it is not merely a pass time activity lightly practised by city housewives. Rather, it is an important economic activity by women, which enables them cope with urban realities. Indeed only 24.1% (29) of the women in the sample indulged in agriculture as a hobby.

Generally the impression given by the respondents in this survey is that women become urban cultivators out of sheer necessity. However, they are seen to have chosen an occupation that requires little capital and which combines well with their domestic obligation of feeding the family in addition to earning an income.

6.2 Policy Suggestions

Study findings reveal that urban agriculture is an additional (extra) survival strategy for women. It could be seen as a way of feeding the city through the grass root efforts of low-income earners especially women. However, since Mazingira Institute brought the subject into limelight in 1987, there seems to be no efforts by the government to legalise it as an informal sector (economic) activity. Indeed, the Ministry of Agriculture is not serving urban farmers through provision of agricultural extension services. In light of this, the study recommends that the government should legalise urban cultivation, which is a sure source of income and food to the low-income urban residents, especially women. Currently, failure to implement by-laws concerning urban cultivation seems to give the practice only a quasi-legal status.

The plea made by 25.8% of the respondent to be allocated farming land is a pointer that urban agriculture shall continue and needs legalisation and government support. A favourable legislation will enable farmers and planners to design and manage nutritionally self-reliant cities.

Credit services in the expansion of business and other economic activities initiated by the poor are vital. However, there is very little formal development aid if any, allocated to urban farming. Thus, the need for government and NGO interventions is very

urgent. A credit-base for women urban farmers needs to be created. Since poor women lack collateral such as land and property (which most banks require as first line collateral), the basis of such loans could be a social collateral system. This is where people form small groups and guarantee one another for loans. Practical evidence in micro-credit organisations such as BKM-SOMIRENEC and ANP-AMREF shows that loan repayment is quite successful through the social collateral system. Thus relevant institutions should advance loans to women who form themselves into groups where group members act as guarantors to each loanee.

Due to the perceived low environmental maintenance through urban cultivation, there is need for the government to allocate wetlands along rivers and other wastelands to women urban farmers. This could be a viable government plan for making such land productive for the benefit of the urban poor in addition to creating an extra 'legal' job opportunity in the informal sector.

For sustainable urbanisation, there is need for biological processing of both solid and liquid urban waste. Urban agriculture is seen to fulfil this function efficiently and economically by utilising wastewater for irrigation and solid urban waste for manuring of crops. In order to foster increased biological processing of urban waste, NGOs and the government should strive to assist farmers through creation of wastewater - irrigation projects. This calls for assistance of city planners in creation of sewerage systems whose water can be safely tapped and treated for use in farms. In addition, the Ministry of Health and the City Council health department should give advice on the extent to which such water is safe in irrigation. In addition the Ministry of Agriculture

in conjunction with health personnel should advise farmers on the type of crops to grow in such projects without endangering their lives and that of other consumers.

Finally, the research and extension departments of the Ministry of Agriculture, together with Universities should extend their services to urban farming. Such will create a strong information base and a technical assistance system which will generally enable urban cultivators to overcome some of the impediments such as lack of knowledge on farming techniques appropriate in urban cultivation. Extension services will assist women urban cultivators to increase crop yields through better soil management skills and planting techniques.

These policy recommendations, if implemented'would reduce fear among urban cultivators in addition to encouraging more people to get involved in the practice. Urban agriculture would then become a recognised enterprise in the informal sector and would contribute significantly to the growth of the country's GDP in addition to making cities food self- sufficient.

Generally, the future of urban agriculture lies in the systematic and careful implementation of policies that favour food production in urban areas. This calls for city authorities and urban planners to include urban farming in city planning by allocating it enough space in appropriate areas in the city.

6.3 Areas for Further Research

A single research is far from adequate in addressing all issues in a particular subject. Certainly, additional research is needed to investigate the environmental impact of urban agriculture, which operates on the primary level of production.

Though a seemingly dangerous practice, irrigation of crops using sewerage water is one way through which women are participating in the recycling of wastewater. However, the dangers involved in such a practice need to be documented and viable ways designed to counter them. Research is thus needed to define what level and type of pollution is tolerable by which crops, and to determine the extent to which wastewater is a good fertilizer. This will enable farmers and willing organisations to start wastewater irrigation projects for purposes of recycling sewerage water. Effort is thus called for from the relevant technical health personnel on environmental and agricultural issues.

Livestock keeping (which is usually on zero grazing systems) has been given little attention in the literature and in this study. Research is therefore needed to put it into the limelight in terms of its benefits and viability in the city in particular and to the economy in general.

BIBLIOGRAPHY

Adejuwon, J.O (1979), An Introduction to the Geography of the Tropics, Nelson. London.

Anangwe, K.A. (1995) "The effect of formal education and cultural values on the use of methods of contraception among urban women. The case of Nairobi." M.A. Thesis, University of Nairobi (unpublished).

Agency for International Development (1976) "Developing World Industry and Technology" A.I.D - Washington D.C.

Andah, K. "Ghanaian Women in Agriculture. The case of food production". Paper prepared for Ghana National Council on women and Development (September, 1978).

Andrae, G. (1992) "Urban farmers as workers: Agro-links of Nigerian Textile workers in the crisis of the 1980's". In J.Baker and P.O. Pedersen (eds), The rural-Urban interference in Africa: Expansion And Adaptation, PP 200 - 222, Copenhagen: The Scandinavian Institute of African studies and centre for Development Research, Seminar proceedings no. 27.

Best, J. and Kahn, J. (1989) Research in Education. Practice Hall, India

Boserup, E. (1970). Women's Role in Economic Development. St. Martin's Press, New York.

Central Bureau of Statistics (1979) Kenya Population Census, 1979. Government printer, Nairobi.

Central Bureau of Statistics (1986) Urban Housing Survey 1983 Basic Report. Ministry of works, Housing and Physical planning (Department of Housing) and ministry of planning and National Development, CBS, Nairobi.

Central Bureau of Statistics (1994) Kenya Population Census, 1989. Government Printer, Nairobi.

Central Bureau of Statistics (1994) Economic Survey, 1994. Central Bureau of Statistics, Nairobi

Central Bureau of Statistics (2000) Kenya Population Census, 1999. Government Printer, Nairobi.

Chambers, R. (1983) Rural Development. Putting the last first Longman, Nairobi.

Dennery, P. R. (1995). Inside Urban Agriculture: An exploration of food Producer decision making in a Nairobi slum. Unpublished M.A. Thesis, Wageningen Agricultural University, The Netherlands.

Diyums, F. D. P. "The environmental problems in the city of Nairobi." In '*African Urban Quarterly*'. Vol.7 Nos. 1 and 2, Feb. and May 1992. pp. 167-174.

F.A.O (1996) "The State of Food and Agriculture: FAO Agricultural Series No. 29". Rome, Italy.

Freeman, D.B. (1991) A City of Farmers: Informal urban agriculture in the open spaces of Nairobi, Kenva. McGill - Queen's University Press, Toronto.

Freeman, D.B. "Survival strategy or business training ground? The significance of urban agriculture for the advancement of women in African cities", In African Studies Review, Vol. 36 No. 3 of December 1993, pages 1-22.

Fortmann, L. and Rocheleau D. (1985). "Womer and Agro forestry: four myths and four case studies". ICRAP reprint No. 19, ICRAF reprint series.

Gutman, P. (1986) "Feeding the City: Potential and Limits of Self-reliance". In Development: Seeds of Change 4(1986) pages 22-26.

Gugler, J. "Urban Ways of Life". In Gilbert, A. Alan and Gugler, J. (1981) Cities, Poverty, and Development: Urbanisation in the Third World. OUP, New York, (pages 117-133).

Gwako,L.M. (1990) "Women's status and fertility behaviour in Kenya: A case study of Nyamache division, Kisii District". Unpublished MA Thesis University of Nairobi

Harnett, L.D. and Murphy, L.J (1980; Introductory Statistical Analysis. Addison - Wesley Publishing Company. London.

Hart, D. and Pluijmers, J. (1996) "wasted Agriculture: The use of Compost in Urban Agriculture". Urban Waste expertise Programme (UWEP); Working Document 1 (April 1996)

Hellmann, E. (1984) Rooiyard; A Sociological Survey of an Urban Native Slum Yard. Manchester University press, Manchester

International labour office (1972) "Employment Incomes and equality; A strategy for increasing productive employment in Kenya" ILO Geneva.

Jackson, C, (198M The Kano River Irrigation Project: Women's Role and Gender Differences In Development. Kumarian press. West Hartford

Judd. C.M and Kidder, L.H (1986) Research Methods in social relations (5th Ed.), CBS college Publishing. New York.

Kaberere, J. (1987) "Developing the informal sector in small town in Kenya". M.A. Thesis, Cornell University (unpublished).

Kenya, Republic of. (1989) Development plan, 1989-1993.Government printer, Nairobi

Kenyatta, J. (1978) (Revised Edition) Facing Mount Kenya: The tribal life of the Gikuyu. Heinemann educational books, Nairobi

Kerlinger, F.N (1964) Foundations of Behavioural Research. Holt, Rinehart and Winston, Inc. New York.

Khasiani, S.A. and O.M. Mugenda (1992). "Research Methods" Working Paper No.l. Association for Research and Development (AAWORD-Kenya). Nairobi: AAWORD.

Korongo, A. (1999) "Aids and Marital Status: A study of wcmen's HIV/AIDs knowledge and preventive behaviour in Sabatia Division of Vihiga District, Kenya." Unpublished M.A Thesis, University of Nairobi.

Lamba, D. (1993) "Urban Agriculture: Eastern Africa". In L.J.A. Mougeot and D.Masse (Eds). Urban environment Management; Developing a Global Research Agenda.Vol 1, pp 90-97 International Research centre Ottawa.

Lamba, D. (1994) Nairobi's Environment: A review of conditions and issues. Mazingira Institute, Nairobi.

Lee-Smith, D. "Gender, urbanisation and environment: A Research and Policy agenda". A summary of the International seminar on gender, urbanisation and environment held in Nairobi on June 13lh -16th, 1994.

Lee-Smith, D. and Lamba, D. "The potential of urban farming in Africa" in *Ecodecision,* December 1991. PP 37-40

Lee-Smith, D; Manundu, M; Lamba, D; Gathuru, P.K. (1987) Urban food production and the Cooking Fuel Station in Urban Kenya - National Report: results of 1985 National Survey, Mazingira Institute, Nairobi

Lee-Smith, D; Manundu, M; Lamba, D; Gathuru, P.K. (1988) Urban food production and the Cooking Fuel Station in Urban Kenya: Annex Six (Town Report - Nairobi). Mazingira Institute, Nairobi

Mani, J. (1960) Mobilisation of the informal sector for Kenya's development. Studies on Kenya's informal sector. National Council for Science and Technology, Nairobi.

Maxwell, D. and Zziwa, S. (1990) Urban agriculture: A case study of Kampala. Makerere Institute of Social Research, (unpublished report).

Masinde, J. R. M. "The role of women in rural development in Kenya" in Chitere, O. and Mutiso, R. (1991) Working with rural communities: A participatory action research in Kenya. Nairobi University Press, Nairobi.

Masasabi, M. J. R. (1987) "Determinants of women groups performance and their implication for rural development planning. A case study of Sirisia Division in Bungoma District". M.A. Thesis, University of Nairobi (unpublished).

Makokha, J. (1985). The district focus: Conceptual and management problems. African Press Research Bureau, Nairobi, Kenya.

Mehra, R. and Buvinic, M. (1990) "Women In Agriculture: what development can do". International Centre for Research on Women (ICRW) Washington DC.

Memon. P.A. and Lee Smith, D. (1993) "Urban Agriculture in Kenya". *Canadian Journal of African Studies* 7(1): 25-42.

Miles, M.B. and Huberman, A.M (1994) Qualitative data analysis an expanded source Book (2nd ed.), sage publications, USA

Mwangi, A. M. (1995) The role of urban agriculture for food security in low-income areas in Nairobi. Food and Nutrition Studies Programme, Report No. 54/1995.

Mougeot, L. "Urban food self-reliance: Significance and prospects". In 'Farming in the city: The rise of urban agriculture'. IDRC reports Vol. 21 No. 3 October, 1993: 1-5.

Mougeot, L. (1994) Cities feeding people: an examination of urban agriculture in East Africa. International Development Research Centre (IDRC), Ottawa, Canada.

Moser. A. and Carlton, G. (1971) Survey methods in social investigation, 2nd edition. Heinemann Education Books, London.

MuHer,M.S. (1990) "Women in African Cities" *African Urban quarterly* 5 (3&4) Aug and Nov 1990:161 - 167

Mulusa, T. (1990) Evaluation Research for Beginners: A Practical Study guide. German Foundation for International Development, Education, Science and Documentation Centre, Bonn.

Mugenda, O. M and Mugenda, A.G. (1999) Research methods : Quantitative and qualitative Research methods . ACTS Publishers.

Mazingira Institute (1987). Urban food production and the cooking fuel situation in urban Kenya. Nairobi-annexe (Mazingira Institute).

Mvena. Z.S. K., Lupanga, I.J and Mlozi, M. R. S. (1991)"Urban agriculture in Tanzania: A study of six towns." Sokoine University of Agriculture and International Development Centre. (Unpublished).

Nelson. N. (1978) "Female centred families: Changing patterns of Marriage and family among Busaa Brewers of Mathare Valley". *African Urban quarterly*. 3: 85-103

Ngau, P (1979) "The internal structure of Residential areas in Nairobi". Unpublished M. A. Thesis, University of Nairobi.

Nie, H., N. Hadlai, J. Jenkins, K. Steinbrenner ahdB. Dale. 1970. Statistical Package for Social sciences (SPSS). New York: McGraw Hill Inc.

Norusis, M.J (1993) "SPSS for windows, Base System Users guide, Release 6.0," SPSS Inc. USA.

Nyang'au, T. M (2001) 'Determinants of Girls' Schooling after Pre- Marital Pregnancies: A Case Study of Kenyenya Division, Kisii District.' Unpublished MA Thesis, University of Nairobi.

Obara, D.A. "Urban Agriculture in the Third World with particular reference to Nairobi City, Kenya". Paper presented in the first International Conference on urban growth and Spatial planning of Nairobi, Kenya- Held in December 13^{th}-17^{th}, 1988, Nairobi, Kenya.

O'Connor, A.M. (1983) The African city. Hutchinson, London.

Ogburn, W.F. (1964) On culture and social change: selected papers. University of Chicago press, Chicago.

Opinya, N. (1982) "Population pressure on urban Housing. The case of Nairobi." Unpublished M.A. Thesis, PSRI, University of Nairobi.

Ominde, S. H. (1968) Land and population movement in Kenya. Heinemann, London/Nairobi.

Palmer, I. (1975) The Impact of Male out-migration on Women in farming.

Kumarian Press. West Hartford. Connecticut.

Prewitt, K. (1975) "Introductory Research Methodology, East African applications". Institute for Development Studies, University of Nairobi. Occasional paper No. 10.

Rakodi, C. (1988) "Urban Agriculture: Research question and the Zambian Evidence". In *Journal of Modem African Studies*, Vol.26 pp.495-515.

Redfield, R (1941) The folk culture of Yucatan. University of Chicago Press, Chicago.

Siegel, S. (1956) Non -Parametric Statistics for the Behavioural Sciences. New York: McGraw Hill Company.

Silk, D. (1986) "The potential of Urban Agriculture: Growing vegetables and hope". *Work in Progress*, vol.10 No. 1, October 1986,

Situma, F.D.P (1992)'The Environmental problems in the city of Nairobi, Kenya". *African Urban quarterly,* 7 (142): 167-175.

Sovani, N. V. "The analysis of over urbanisation." In Breese, G. (ed) (1969) The City of Newly developing Countries: Readings on urbanism and urbanisation. Englewood Cliffs, Prentice hall, Inc. Pp.322-330.

Syagga, P. M. and Kiamba, J. M. "Housing the urban poor: A Case study of Pumwani, Kibera and Dandora estates in the City of Nairobi". *African Urban Quarterly* 7 (1 &2), Feb and May, 1992 pp.79-88.

Thomas, W. and Znanieck, F. (1974) The Polish Peasants in Europe and America. Vol. I and II, Octagon books, Newyork.

Wagner, G. (1949) The Bantu of North Kavirondo. Oxford University Press, London.

Wade, I. (1987) "Community food production in Cities of Developing Nations". *Food and Nutrition Bulletin* 9(2): 29-35.

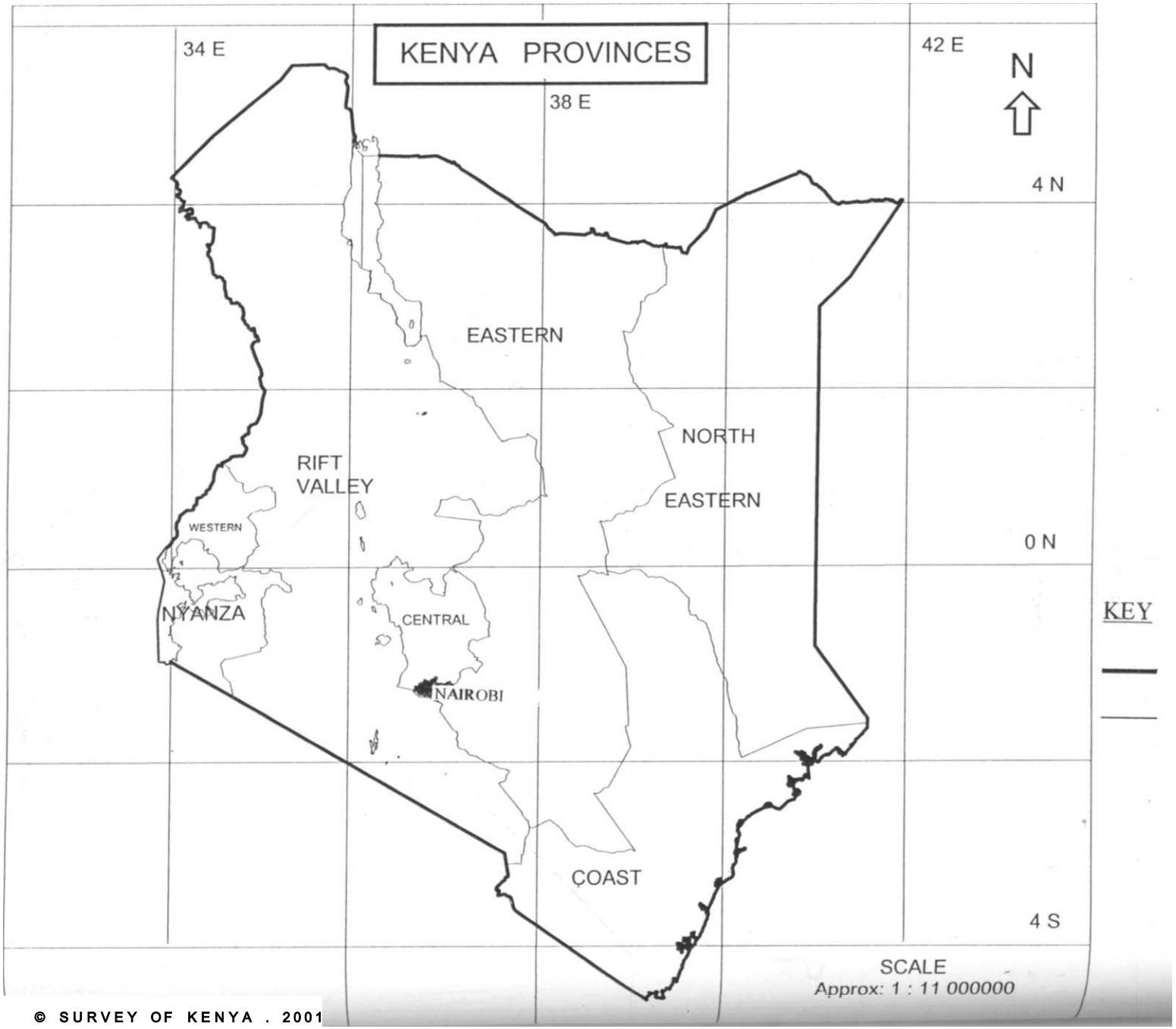
Weber, M. (1864-1920) The Protestant Ethic And The Spirit Of Capitalism. (New edition). Translated by Talcott Parsons (1958). Scribner, New York

Wirth, L (1938) "Urbanization as a way of life ". *American Journal of sociology,* 44:1-24

Yeung, Y. (1986) "Urban agriculture: Three cities in Asia". *Work in Progress,* Vol.10 No. 1, October 1986, United Nations University.

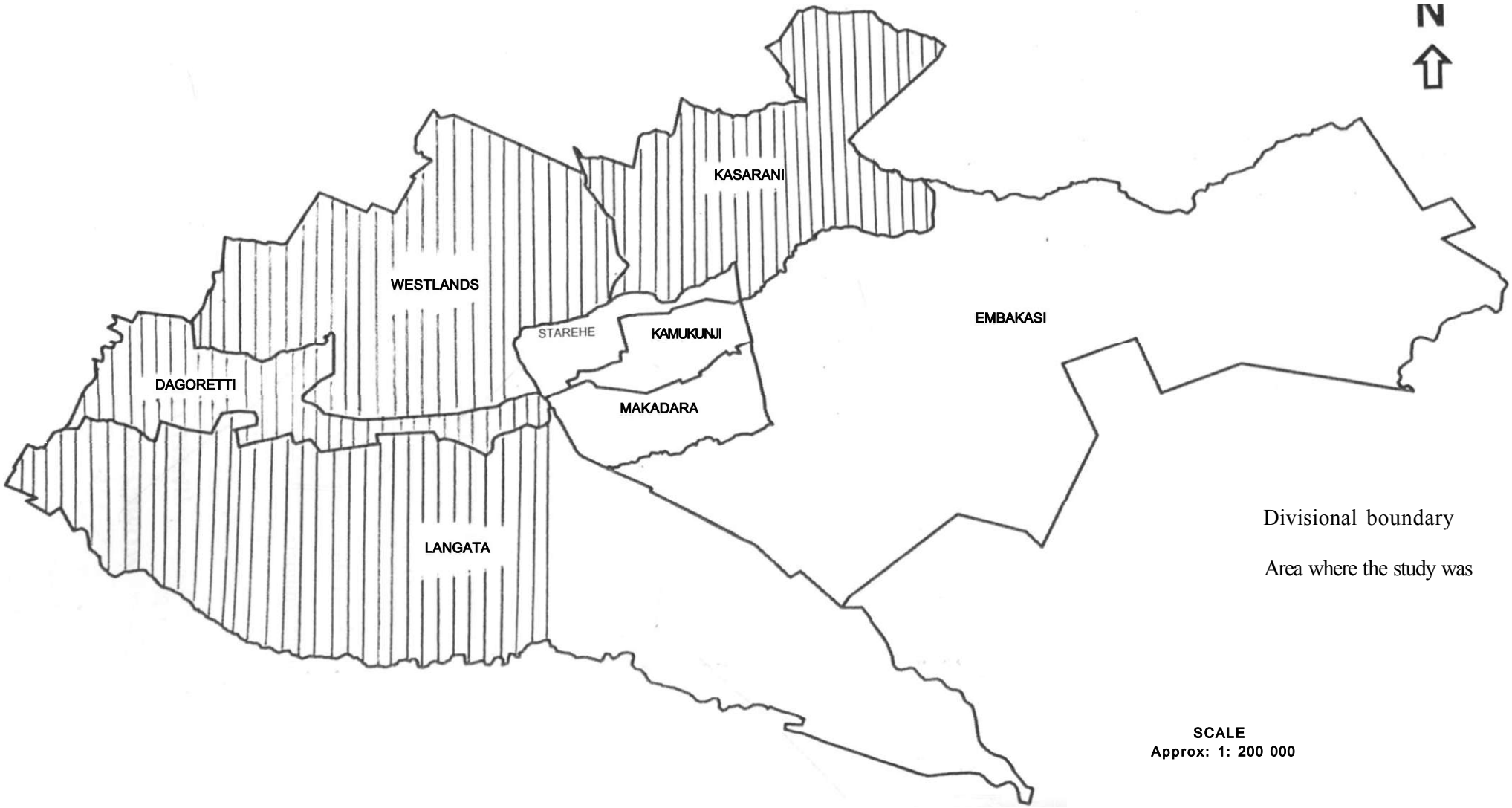
Yunus, M. and Jolis, A. (1998) Banker to the poor. The university press limited, London

APPENDIX A: MAP OF KENYA SHOWING THE LOCATION OF NAIROBI



APPENDIX B: MAP OF NAIROBI SHOWING AREAS WHERE THE STUDY

nmrnni t m i n ' ^ p a t i v f d i v i s i o n s



APPENDIX C

WOMEN AND URBAN AGRICULTURE

(INTERVIEW SCHEDULE)

Questionnaire Number^

Name of Respondent:—

Residence:

A) FARMER'S SOCIO-ECONOMIC CHARACTERISTICS

1. Age: _____ years.

2.a) Marital Status

I) Married IV) Single

II) Divorced V) Widowed

III) Separated VI) Other, (specifyX-

b) If married, what is your husband's current occupation'?

3. How many wives does your husband have?

4. Does your husband stay in the city?

5. Level of education

i) No formal education v) Form 3 to Form 4

ii) Adult literacy vi) Form 5 to Form 6

iii) Std. 1 to Std. 8 vii) Formal training (specify)

iv) Form 1 to Form 2 viii) University graduate and above

6. Occupation

7.a) [4] Do you have any other source of income other than this employment/occupation? i) Yes ii) No

b) If yes, what are the other sources?

i) _____

ii) -

8. Ethnicity

9. Religion

10.a) Do you have any children? i) Yes ii) No

b) If yes, how many girls do you have?

c) How many boys do you have?

11 .a) How many of your children are in pre-school?

b) How much do you pay for them as fees per term?

12.a) How many are in primary school?

b) How much do you pay for them as fees per term2

13.a) How many are in Secondary school?

b) How much do you pay for them as fees per term?

14.a) How many are in college/university?

b) How much do you pay for them as fees per term?

15 How much money do you spend in meeting your household needs (such as food, clothing, fuel, e.t.c.) per month? Kshs.

16. Is the house you live in rented, owned or belongs to the employer?

i) Rented ii) Personal iii) Belongs to the employer

17. What is your average income per month? Kshs.

B) REASONS FOR URBAN CULTIVATION

18. When did you come into the city of Nairobi?

19. Why did you come into the city?

i)

ii)

20. When did you start cultivation in the city?

21. What was your occupation when you started cultivation in the city?

22. Where was your first garden situated?

23. How did you acquire the land on which your first garden was situated?

24. If the land was rented, how much did you pay per season/year? (Specify amount and period)

Ksh. _____ Per

25. What crop varieties did you plant in your first garden?

0

ii)

iii)

26. For what purposes were the crop yields from your first garden?

i)

ii)

27.a) Have you changed site or relocated your garden since then?

i) Yes ii) No

b) If yes, why did you relocate your garden?

28. Why did you start cultivation in the City?

ii)

29. What crop varieties do you grow in your current garden(s)?

i)

ii)

iii)

30. In what ways do you use your garden products?

i) Household use

ii) Sale

iii) Both

iv) Other (specify)

31.a) Do you also keep livestock? i) Yes ii) No

b) If yes, what type of livestock do you keep?

i)

ii)

iii)

32. For what purposes do you keep the livestock?

i) For sale iii) For household consumption

ii) As pets iv) Other (specify)

C) FARM CHARACTERISTICS

> 33.a) How many gardens do you have in the city?

b) Where are they located?

Garden Number	Location

34. How far is/are your garden(s) from your house?

Garden Number	Distance in Kilometres

35. What is/are the approximate size(s) of your gardens?

Garden	Approximate size

36. Who owns the land on which your current garden(s)

Garden Number	Owner of land

37. How did you acquire the piece(s) of land on which your current garden(s) stand(s)?

i)

ii)

38.a) Have you rented any piece of land on which you cultivate?

i) Yes ii) No

b) If yes, how much do you pay for a plot per season/year?

Kshs. _____ Per

(Specify amount and period)

39. Who made arrangements for you to acquire the land on which you cultivate?

i) Self ii) Husband

iii) Both of us iv) Other (specify relationship)

40. Why did you consider the place on which your current garden(s) stand(s) suitable for cultivation?

41 .a) Do you have a shamba/garden of your own in the rural areas?

i) Yes ii) No

b) If yes, what crop varieties do you grow in your rural shamba/garden?

i)

ii)

42.a) Do you also keep livestock in the rural areas?

i) Yes ii) No

b) If yes, what type of livestock?

0

ii)

43. Which season(s) of the year do you cultivate your city garden(s)?

i) Rainy seasons ii) Dry seasons iii) Both

44. How many times in a year do you cultivate your city garden(s)?

45. What crop varieties do you plant in each of these periods?

Period	**Crops Grown**
Dry season	
Rainy season	

46. Where do you get the planting seeds/materials from?

47. Who is charged with the responsibility of looking for planting seeds/materials?

i) Self ii) Husband

iii) Both of us iv) Other (specify relationship)

48. Who decides on what is to be grown in your garden(s) each season?

49. Who does the actual a) Planting? _

b) Weeding? _

c) Harvesting?.

50. Do you practice any of the following?

a) Crop rotation i) Yes ii) No

b) Erosion control i) Yes ii) No

c) Irrigation i) Yes ii) No

d) Manuring i) Yes ii) No

e) Pest control i) Yes ii) No

51. Who decides on who is to do actual farm-work (planting, harvesting, irrigation e.t.c.) in the garden?

52.a) Did you have any prior experience on cultivation before starting cultivation in the city?

i) Yes ii) No

b) If yes, where did you get such experience from?_____

53. Where do you get labour from?

54.a) Do you at any time employ hired labour in your garden(s)

i) Yes ii) No

b) If yes, how much do you spend on hired labour per season?

Approx. Kshs.

55. For what purpose are your garden products?

i) For sale

ii) For household consumption

iii) Both

iv) Other, specify

56. Who decides on how the garden is to be used?

i) Self ii) Husband

iii) Both of us iv) Other (specify relationship)

57(a) Do you sell some of your garden products? i) Yes ii) No

(if no, go to Qn 60)

b) If yes, what proportion of your produce do you sell?

i) Less than $^{1}/_{4}$

ii) $^{f}/_{2}$

iii) More than $^{3}/_{4}$

iv) All

c) What proportion of your garden produce (yields) is left for household consumption?

i) Less than Vi

ii) V_2

iii) More than $^{3}/_{4}$

iv) All

v) Nill

58. Approximately how much income do you earn from the sale of your garden produce per season?

59. Who makes decisions on how the income is to be used?

i) Self ii) Husband

iii) Both of us iv) Other (specify relationship)

60. Would you say that you have control over your gardening activities?
i) Yes ii) No

61 .a) If no, why don't you have control over your gardening activities?

b) Who else controls your gardening activities?

c) Why?

62. Would you say that you have control over the use of your garden produce/income? i) Yes ii) No

a) If no, why don't you have control over the use of your garden produce /income?

b) Who else controls the use of your garden produce and income?

c) Why?

D) PROBLEMS ENCOUNTERED BY WOMEN URBAN CULTIVATORS

64. Do you experience any problems in relation to your gardening activities?

i) Yes ii) No i

65. If yes what is the main problem that you face?

66. What other problems do you face?

i)

ii)

67. Are there some problems regarding your gardening activities, which you face JUST because you are a woman?

i) Yes ii) No

68. If yes, which are these problems?

i)

ii)

69.a) Do you ever receive visits (services) from agricultural officers?

i) Yes ii) No

v

b) If yes, how often are these services?

i) Very often ii) Often

iii) Once in a while iv) Can't say

v) Not at all'

70. When did you last receive these services?

71. What do you think is the best way to alleviate the problems that you face while undertaking cultivation in the city?

72. How would you like to be assisted in order to succeed in your gardening activities in the city?

Thank you.