FACTORS INFLUENCING THE CONTRIBUTION OF URBAN AND PERI-URBAN AGRICULTURE TO HOUSEHOLD FOOD SECURITY IN KERICHO COUNTY, KENYA

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DECLARATION AND APPROVAL

Declaration

This thesis is my original work and has not been presented for the conferment of a degree or for the award of a diploma in this or any other university:

Signature _____ Date _____

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AGR/PGEX/002/10

Approval

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DEDICATION

This thesis is devoted to my dear wife, Loice Rotich; my children, Victoria, Victor and Emmanuel and my dear mum, Grace Tonui. I would also like to devote this project to my esteemed supervisors, Prof. Joash Kibett and Dr. George M. Kere.

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ABSTRACT

Many households are consistently turning to Urban and Peri-urban food production for consumption and commercial purposes. However, there is limited research, if any, that has been conducted to explore the effect of Urban and Peri-urban Farming on household livelihoods, food security and income. The purpose of this research was to identify aspects influencing the role of Urban and Peri-urban Agriculture (UPA) in household food security in Kericho County. The following research objectives directed the research; to establish the effect of extension services on the household food security; to determine the effect of farmer characteristics (age, gender, education level, employment status, farm income) on food security; to describe the influence of production characteristics (size of the land, land ownership, inputs) on household food security and analyse the influence of farmers' access to the market on the household food security. A descriptive research design was used in the study. The targeted population comprised of 3487 urban and peri-urban agriculturalists in Kericho County. A sample of 341 Urban and peri-urban agriculturalists was sampled using Multistage Sampling method. Data was collected using a structured and unstructured questionnaire. Data were then analysed using frequencies and percentages while hypotheses were tested using chi-square and regression analysis at 0.05 alpha level. Inferential statistics were calculated using SPSS Software Version 21.0. The results revealed that a unit increase in extension services increases household food security by a margin of 0.712, and a unit increase in farmer characteristics increases household food security by a margin of 0.674. Similarly, a unit increase in production characteristics increases household food security by a margin of 0.791, and unit increase in access to market increases access to household food security by a margin of 0.833. The study concluded that extension services, farmer characteristics production characteristics and access to market directly influence household food security in Kericho County. Based on the outcomes of the research, it is suggested that the County Government and other stakeholders provide capacity enhancement to the farmers in the urban and Peri-urban setting to enhance food sustainability in the county. The study results will be useful to the County government in planning and policy-making. The academicians and researchers can also be advantaged by this study's findings in filling the knowledge gap about the study area.

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LIST OF ABBREVIATIONS AND ACRONYMS

CFSC	Community Food Security Coalition
FAO	Food and Agricultural Organization
FFS	Farmer Field School
GDP	Gross Domestic Product
ILRI	The International Livestock Research Institute
NGOs	Non-Governmental Organizations
PRA	Participatory Rural Appraisal
RRA	Rapid Result appraisal
SSA	Sub-Saharan Africa
UNDP	United Nations for Development Programmes
UPA	Urban and Peri-urban Agriculture
MOFED	Ministry of Finance and Economic Development

DEFINITION OF TERMS

Access to extension services The term 'extension services' is here comprehended to signify 'advice and additional administrations services' that assist countryside households to make ideal utilization of the gainful assets available to them (Katz, 2002). In this study, access to extension services means access through field days, exhibitions, farm visits and on-farm demonstrations.

Access to market refers to Market linkages that enable the facilitation of flow of agricultural products between the different categories of the marketing levels that focuses on the performance of the marketing system that can be made more efficient and competitive and thus subsequently facilitating economic growth and benefits to farmers with the lowest cost possible which will minimize losses occurring at each stage. In this study, it will be used to mean access to the market through market infrastructure, customer base, market segments and market competition.

Farmers' Characteristics is the developmental linkages of farmers concerning food security. In this study, farmers characteristics include training, economic status, age and social status that enable farmers to meet food security in households in Kericho County, Kenya.

Farmers' level of access to Credit	refers to the capacity to get stock or service prior to making payments, in the perspective of accepting that part of the payment was made later on: "boundless credit".
Food security	is the family's capability to acquire, either from its particular cultivation or through purchases, enough food for meeting the nutritional requirements of all people from the family. In this study, it was used to mean the accessibility of satisfactory sustenance to meet families' dietary needs in Kericho County, Kenya.
Households Access to Information	Talks about the capability, right and authorization by families to approach and utilize the existing agricultural capital that provides recommended farming practices.
Household's characteristic	denotes the household's realities, which define them as the number of children, economic position, level of education, and belief.
Household Perception	alludes to the procedure by which family units explain concrete impressions into a sensible and bound together perception of their broad environment.
Production characteristics	are models of farming practices. In this study, it was used to mean farming practices that contribute to food security in Kericho County, Kenya, e.g. method of farming, access to land. In this study, production

	characteristics mean a method of farming, access to land, access to credit and adoption of farm inputs.
Urban and Peri-urban Agriculture	are agricultural practices carried out in urban areas and their immediate environs. In this study, it was used to mean farming practices conducted in Kericho County Urban centres and its immediate environs.
Urban and Peri-urban areas	in this study are defined as those areas (Kericho town, Kipkelion, Londiani and Litein) which are transforming amid the urban and old-fashioned landscapes as determined by day-to-day travelling distance to the central business centres of the neighbouring city and or town.

CHAPTER ONE

INTRODUCTION

1.1 Overview

The chapter presents the background of the study that led to the formulation of the statement of the problem. Statement of the problem is followed by the objectives of the research, hypotheses, significance of the study, research justification, significance of the study, range, and the limitation of the study.

1.2 Background of the Study

Agriculture is among the essential sectors, and is the foundation of the Kenyan economy, adding up to around 25% of the Gross Domestic Product (GDP). Agriculture also employs approximately 75% of the national work force and is one of the big four agendas under the nation's administration (The Republic of Kenya, 2017). More than 80% of the Kenyan population who live in the country zones earn a living, specifically or by implication from agriculture. The growth of the agricultural sector is crucial in poverty alleviation. The economic and demographic growth of cities globally, via relocation and industrial development, results in spatial expansion, leading to encroachments by cities upon adjacent urban and peri-urban areas (Telintelo, 2001).

Several households are increasingly shifting towards Urban and Peri-urban Agricultural production of food for their consumption and commercial purposes. The primary reason people engage in Urban and Peri-urban Agriculture is to respond to unreliable, inadequate, and irregular access to food supplies as indicated by the Food and Agriculture Organization (2012). Around 870 million individuals are believed to have been malnourished in 2010– 2012. This figure translates to 12.5% of the

worldwide population. By far, most of these, 852 million resides in emerging countries (Bon, 2010).

Urban and peri-urban horticulture has a huge commitment to the sustenance supply of numerous Sub-Saharan Africa (SSA) urban communities and takes care of most of the urban population in terms of food provision. This incorporates vegetables, crisp drain, and poultry farming, among others. Along these lines, Urban and Peri-urban Farming contributes fundamentally to a higher assortment of nourishments in the city markets, adding to better vocations, work, and accordingly destitution lightening. The creation of harvests principally relies upon the accessibility of water for the water system (Corrigan, 2011).

Farming in Kenyan towns is exponentially gaining significance as revealed by the agricultural activities on immediate environs of these towns and in the heart of the Kenyan towns (Corrigan, 2011). Agricultural activities have been witnessed alongside roads, railways, waterways, amidst roundabouts, and in parks, just to name a few. Farm animals such as goats, cows and sheep graze around in towns and open spots. Generally, if UPA is implemented effectively, it enhances farming efficiency, leading to enhanced food availability (Evenson and Mwabu 2001, Romani 2003).

Recent studies have revealed that 64% of people leaving in urban areas in Kenya practice urban agricultural farming (Hide and Kimani, 2015). Therefore, urban agriculture is a strategic tool adopted in a bid to address household food insecurity, challenges of unemployment, and encouraging productive participation in local and urban development.

Urban and Peri-urban Agriculture (UPA) may be practiced on farmstead (on-plot) or private land (owned, leased) land away from the dwelling places (off-plot), or on public land including parks, safeguarded areas, roadside, watercourses, and railways.

As a result of urbanization, land for farming has decreased, raising concern for some households' food security. According to Food and Agriculture Organization, (FAO, 2012), families are believed to be secure when all n members have enough food to sustain themselves for the whole year and even have supplies that they can sell to get some source of income for sustenance. FAO (2012) characterizes food security to provide food for the household sustainably through its production.

In Kenya, urban agriculture has been adopted by most urban people and well-established urban farming, but this kind of farming has not gone well with the government. However, there is growing advocacy for policy to improve urban agriculture research. Moreover, resources that are meant for the public are diminishing compared with the need for population growth. Therefore, it is necessary to establish the effect of Urban and Peri-urban Agriculture on household food security due to the dynamics in urbanization and land availability.

There is an urgent need to integrate Urban and Peri-urban Agriculture into urban management and policy schedule in Kenya. Therefore, there is a need for more logical policies, especially on the positioning of crop growing and livestock. Urban and Peri-urban Agriculture is currently not run or managed by any government agency. Furthermore, Kenyan urban food security depends principally on provincial agrarian creation, but a limited or poor framework, unavailability of the cooling system or plant and poor marketing plan, at that point Urban and peri-urban sustenance generation tends to increase. As indicated by Baumgartner and Belevi, (2001) deficient security, wars, and fiascos also influence, although when in good conditions, Urban and Peri-urban farming has the benefit of market vicinity and freshness, and this is perceived in created nations. Fast development in urban populace is a factor in urban agribusiness development.

The challenge for urban agriculture in Kenya can be derived from recognizing the restricted dynamic help from city authorities, or even in the struggle with city planners or health experts concerning land residency and water utilization. Numerous family units in Urban and peri-urban areas are confronting varied problems such as a genuine decrease in their purchasing power, lack of formal employment, growing poverty, hunger, and an increase destitution levels resulting in assorted development agricultural systems in these areas.

Individuals have reacted in diverse methods to address the same, most eminently by differentiating their wage bases, including urban agribusiness and urban and peri-urban farming. Different family units, particularly living with poverty levels lean towards developing their vegetable production because of their expanded attention to wellbeing dangers related to most farms produce in the market centres. Substantial studies record that urban agriculture is an undeniably critical business activity in developing nations that contribute to both family unit job needs and the casual urban economy. Development Programmes by NGOs such as Cities Farming for the Future (CFF), and the International Development Research Council (IDRC's) AGROPOLIS have endeavoured to put urban agribusiness onto the approach motivation the improvement of policies in developing countries. Despite these programmes that promote Urban Agriculture, there is still no relatively in-depth data and examinations on Urban and Peri-urban Agriculture and the degree to which low income like Kericho utilize urban farming (Musonga, 2004).

The capacity to guarantee food security depends on the capacity to distinguish helpless family units. The level of the family unit's weakness is dictated by its presentation to the hazard factors and their capacity to adapt to distressing

circumstances. Keeping up food availability at both the nation and family level is a noteworthy test for some creating nations.

1.3 Statement of the Problem

Although there is increasing responsiveness regarding the function of urban agriculture in the setting of food security and poverty eradication for the urban populace, agriculture in the cities prevails largely as an informal area that has not been incorporated to agricultural strategies or urban scheduling, which makes it exposed to danger while jeopardizing its continuity. Several studies have suggested that urban agriculture will continue to increasingly play an important livelihood role in developing countries by contributing significantly to the household livelihood systems and the urban informal economy. Most of the government's effort to expand agriculture has been directed to rural areas, whereas urban and peri-urban Farming has significantly contributed to food security. Most of the urban and peri-urban dwellers have not been fully relying on rural areas for food. There is limited research, if any, that has been conducted to explore the impact of Urban and Peri-urban Agriculture and its effects on the household source of revenue, food security, and income. This study investigated the factors influencing urban and peri-urban farming's impact on family food security in Kericho County.

1.4. Purpose of the Study

The study's purpose was to investigate the factors influencing the role of urban and peri-urban agriculture to household food security in Kericho County, Kenya.

1.5 Specific Objectives of the Study

The specific objectives of the study were to:

i. Establish the effect of access to extension services by urban and Peri-urban farmers on household food security in Kericho County.
ii. Determine the influence of urban and Peri-urban farmer characteristics on household food security in Kericho County.
iii. describe the influence of Urban and Peri-urban Agriculture production characteristics on household food security in Kericho County
iv. Analyze the influence of urban and Peri-urban farmers access to the market on household food security in Kericho County.

1.6. Hypotheses of the Study

The following hypotheses were tested at the 0.05 alpha level;

$H_0$1.There is no statistical significant relationship between access to extension services and the contribution of urban and Peri-Urban agriculture on food security in Kericho County.

$H_0$2.There is no statistical significant relationship between the characteristics of farmer of urban and Peri-Urban and household food security in Kericho County.

$H_0$3.There is no statistical significant relationship between production characteristics of urban and Peri-Urban on household food security in Kericho County.

$H_0$4. There is no statistical significant relationship between market access by farmers of Peri-Urban and household food security in Kericho County.

1.7 Justification of the Study

Communal gains that have been felt from UPA practices are; employment, improved health, and nutrition, food security, increased income and improved community social life. Therefore, urban and peri-urban can be seen as a strategic tool for improving the livelihood of people. UPA practices are most appreciated as an informal exercise;

however, in several municipalities where unpredictable, inadequate and unbalanced access to food is a circular issue, UPA has brought an optimistic answer to addressing food worries. According to the Community Food Security Coalition (CFSC) report (2015), residential gardening, and small-scale farming, saves family food dollars. It also promotes diet and saves income for non-garden foods among additional items. Confined food production in cities and peri-urban ara enhances the native economies by expanding job opportunities and adding value commodities. There is a need also to recognize and give importance to Urban and peri-urban farming and the use of the latest farming technologies to improve agricultural production to feed the ever-increasing population. Not many studies have been done to determine the factors influencing the impact of Urban and Peri-urban agriculture on family food security in Kericho County, Kenya, and therefore, there was a need to undertake the study.

1.8. Significance of the Study

Different interested parties are expected to gain value from the findings of this study. The findings may expose devolution characteristics and their impact on the regional economy. The findings may facilitate consistent and proactive planning about Urban and peri-urban planning by the county government. The results of the study will benefit the academicians and researchers because it contributes to the existing body of knowledge in understanding food security concerning urban and peri-urban agriculture. Finally, the findings could assist urban farmers in pushing for the recognition of UA and agitate for enacting explicit regulations and guidelines geared to addressing the growth of this significant sub-sector by the relevant agencies.

1.9. Scope of the Study

The study concentrated on urban and peri-urban agriculture and household food security in Kericho County in Kenya. The study was conducted in 2019 and was only confined to four objectives.

1.10. Limitations of the Study

The study was done in Kericho County, which may not fully reflect the scenario in other Urban and Peri-urban parts in different counties in Kenya. The findings should therefore be generalized and applied in other counties with caution. The study could have been directed to all Urban and Peri-urban areas in Kericho County, but the time and resources dictated a smaller sample as the researcher was expected to collect data within selected urban and peri-urban areas.

1.11. Assumptions of the Study

The study expected that the respondents gave solid data that will yield the coveted and reliable outcomes and that every one of the respondents was accessible. The study was also based on the assumption that the political environment was conducive for data collection, and no interference would occur.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

The chapter assesses in-depth literature related to the objective of the study. It converses several viewpoints regarding the study. This is followed by the basic tenets of the theories anchoring the study. Finally, the chapter presents the conceptual framework, a summary of the literature, and locating the information gap. This section considers access to extension services and its use in UPA, farmer characteristics, production characteristics and farmers' access to the market.

2.2 Overview of Agriculture in Kenya

Agriculture dominates the Kenyan economy, accounting for 40% of the total workforce (70% of the rural workforce) and about 25% of the annual workforce. The country's main agricultural exports are tea, coffee, cut flowers, and vegetables. Kenya is the world's leading exporter of black tea and cut flowers.

2.2.1 Urban and Peri-urban Agriculture

It is anticipated that by the year 2020, the greater part of the world's 8 billion human occupants will live in urban areas (Corrigan, 2011). Urbanization in Africa, then again, has been more fast and riotous than in Europe with insufficiencies in direction and infrastructural improvement (Johnson, Suarez and Lundy, 2006). The quick urban development is regularly in conjunction with insufficient administration frameworks, infrastructural advancement, land organization, absence of mechanical and financial development has prompted what is regularly called the African urban emergency (Chiesura, 2004). Caleb *et al*. (2010) noted that urban and peri-urban zones have a

fairly improved basis, for instance, streets, power, and telephone then their rustic partners.

There is rivalry amongst agricultural production and residential housing in Urban and peri-urban land utilizes, with the housing part having a higher monetary return. Urban and peri-urban farming is seen as basically transitory or transient land employments. In this way, there is a need to take a gander at UPA regarding Urban and Regional Planning (Hide and Kimani, 2015). Since Kenya is now occupied with the improvement of a far-reaching Land Policy, there is a chance to incorporate UPA as land utilisation.

The large majority of the African urban dwellers engage in agricultural actions to increase their food sustainability level, although, for many of the poorest, it can be a survival strategy (Sawio, 1994). Farmers participating in Urban and Peri-urban Agriculture faces myriad of challenges including uncertainty of land tenure, small pieces of land, theft, less productive soils, animal and crop diseases, among others. Women play an important role in urban farming, especially from low-income households with inadequate money. Farming generally has been considered the role of women in most African countries which is attributed mostly to the fact that they can easily combine it with home chores. Lack of employment significantly contributed to women participating mostly in Urban and Peri-urban Agriculture as men move out to look for employment.

Approximately 40% of Africans who live in town practiced agriculture, largely dictated by the availability of land off-the plot, on-the plot which may be owned by an individual, government or group (Mougeot, 2001). Agriculture is dominant in the towns' outskirts, especially where it was formerly rural setting but due to the expansion of town has been transformed into an urban setting.

Land abandoned by previous industrial municipalities and households left after calamities like Katrina has been utilized as gardens. The need for food worries and the common illness related to food from manufacturing industries has helped enhance the local production of grown food.

Kericho County is characterized by heavy rainfall, high altitude and fertile soil hence highly productive for agricultural activities. The County receives rainfall almost throughout the area with the main agricultural activities being Maize, pineapples, horticultural crops, tea, and coffee, among others. Animal production is also widely practised in most parts of the county with dairy farming dominance. Friesians and Aryshire are the common breeds for dairy in the area. Despite the county being endowed with these agricultural productivities, little research has been done to ascertain UPA agriculture's contribution in enhancing household food security.

Agricultural extension service gives imperative data, for example, designs in edit costs, new seed assortments, trim administration, and advertising. Familiarity with existing advancements produces successful request by giving a basic flag to enter appropriation frameworks (Davidson *et al*.,2001). Along these lines, expansion frameworks and information dissemination frameworks commonly strengthen the commitment of augmentation to agrarian profitability development, relying upon working information circulation frameworks and the other way around. Also, perfect expansion framework gives criticism from agriculturists to inquire about focuses.

Agricultural extension has undergone restructuring to counter the ever-varying circumstance of progression ahead. Ranchers in inaccessible zones are being urged to develop sustenance trims initially to guarantee nourishment security. Extension needs are being created in three noteworthy agro-environmental zones to help advances that have extraordinary possibilities for cultivating wages and family unit nourishment

security while keeping up the asset base's manageability. Owens *et al*. (2003) scrutinized the consequence of rural augmentation benefit on cultivating generation in Zimbabwe found that in the wake of controlling for natural efficiency qualities and rancher capacity either utilizing family unit settled impacts approximation or by incorporating a degree of agriculturist capacity and the town settled impacts, access to rural expansion administrations, characterized as accepting one to two visits for every rural year, increases the estimation of yield creation by around 15%.

An assortment of extension strategies should be utilized. Choice and utilization of suitable strategies keeping in mind the end goal to meet particular augmentation targets with different classifications of ranchers were important. They incorporate (a) singular homestead and home visits for development, (b) assemble strategies: shows to agriculturists gatherings, field visits, (c) media usage to make mindfulness and achieve vast populace at once, (d) training of farmers and (g) stakeholder's participation.

2.2.2 Access to market in UPA and household food security

Market linkages enable the facilitation of agricultural products' flow between the different categories of marketing levels. According to Reardon *et al.* (2003), productive showcasing foundation, such as discount, retail, and getting together markets and storerooms, is basic for practical advertising, limiting present gather misfortunes and diminishing well-being dangers. Markets assume a noteworthy part in salary age, food security, rustic improvement, creating provincial market linkages and sexual orientation issues. Organizers and approach creators need an inside and out comprehension of how to think of market systems that meet the network's social and monetary needs. Likewise, they ought to know how to pick a reasonable site for

another market. Approach producers need to focus on how to market was overseen, worked and kept up.

2.2.3 Farmers' characteristics and food security

According to England (2000), the initial advance with all connection of improvement is recognising the kind of connotation needed and the extend of outer help that might be principal. It is essential to adjust the extent of help provided with the help needed. Linkages can be endangered by too little and a lot of help. Agriculturists' basic strides to enhance linkages with merchants by building up to deliver may require close to somebody to make the underlying recommendation and go about as the genuine agent. An extension specialist might have the capacity to complete this part.

Gender of the family unit has a critical part in family food security (Kassie *et al*., 2014). Some recognizable and mixed up qualities were considered responsible for the distinction in nourishment safety amongst family headed by father and family headed by mother. The examination recommends that regardless of whether the family head has the same noticeable attributes; undetectable features are in charge of the distinction in nourishment security level. Ibnouf (2011) contended that ladies contrasted with men would probably assume a positive part in family unit food security; the last gathering relocates occasionally and once in a while forever. The investigation uncovered that the real issues that ladies look as a maker are inadequate regarding access to cutting-edge generation strategies, such as excellent seeds, composts, credit access, pesticides, and advertising administrations because of sexual orientation-based conventions. Felker-Kantor and Wood (2012) establish that family headed by mother is shakier when contrasted with the male-headed family.

2.2.4 Production characteristics and food security

The objective of approaching agriculture as a business is to improve the country's earnings or build the income of ranchers and help the provincial economy. This will empower agriculturists and families to enhance their ways of life concerning lodging, food security, and fundamental family unit needs while adding to the progress from subsistence to a money economy production of riches. There ought to be a guide intended to outfit expansion specialists with learning and abilities that will empower them to have a top to bottom comprehension of the business possibilities of little ranch rural generation.

Sifuna (2011) suggests that the extension officers and agriculturists might be guided through the accompanying advances: Comparisons of the expenses and advantages of assorted ways to deal with cultivating and business administration, and understanding business terms ideas associated with the cultivation of different enterprises.

According to Cooper and Kleinschmidt, (2006) the food industry is one in which there is a combination of new things offered to retailers consistently, and the consolidation of another thing regularly prompts halting of another thing. Nonetheless, only an obliged degree of new things showed radical changes; most of them had incremental changes. It was seen that interestingly with various organizations (e.g. contraptions, bio-development) there is an alongside no amount of Research and Development embraced. Item Development is monetarily situated research equipped towards creating items and procedures to fulfil the purchasers' necessities. It is a methodology for present-day explore in its right. It is a mix and utilization of basic sciences with the humanistic systems, of sustenance science and exhibiting and buyer science, into one kind of consolidated research whose point is the change of new things.

2.2.5 Household food security

Household food security denotes food availability to feed a particular household in a sustainable period. In most cases, household food security exhibits certain characteristics, such as product characteristics.

Indicators are frequently grouped into two unique sorts of classes, 'process' and 'result' pointers. The previous gives a gauge of nourishment accessibility/supply, and sustenance gets to circumstance and the last fills in as intermediaries for nourishment usage/utilization. For the most part, process pointers incorporate sustenance supply, and nourishment gets to markers. Nourishment supply markers are known to give data on the probability of stuns or calamity occasions that influence family food security (Ministry of Finance and Economic Development (MoFED), 2002). Nourishment gets to pointers, not like supply markers are generally very powerful to screen food security circumstance at a family unit level. 'Result' pointers incorporate all immediate and aberrant markers of family sustenance utilization, which demonstrates the extend, and variation in nourishment utilization and the measure of sustenance in stores fill in as intermediary gauges for estimating family unit nourishment circumstance. They can be disaggregated at bringing down a level rather than nourishment supply markers (Von Braun *et al*. 1996). Numerous generally utilized measures can mirror the different measurements of nourishment security. Also, there are typically various methods for estimating any single markers.

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2.3. Theoretical Framework

This study was based on two theories, which are Modernization theory and Von Thunen's theory

2.3.1. Modernization theory

Modernization is eluded as the procedure of alteration which occurs when a traditional or pre-present day community varies to an extent, to the point that fresh type of inventive, commanding or communal qualities of 'cutting edge' community show up Coetzee *et al.,* (2004). Distinctive arrangements of qualities, particularly concerning nourishment securing, can be ascribed to 'conventional' provincial social orders and 'modernized' urban social orders then again. The basic conviction of the modernization hypothesis is that by changing society's socio-political and social systems, the course to financial improvement can be accomplished (Onyemelukwe, 2005).

According to Mbiba (2003), modernization would then be characterized as the last state in the social, political and financial improvement of social orders. The innovator hypothesis sees urban farming as a regressive, subsistence and provincial propensity rehearsed by transients who are fresh to municipal regions until they adjust to the 'urban path' of life, or end up utilized in the official division.

Mbiba (2003) likewise declares that the innovator hypothesis observes municipal agribusiness to harm the earth and prescribe its decimation or disposal minus trade-off. The action is seen as a transitory, unhygienic and unattractive movement which ought not to be polished in urban territories by any stretch of the imagination. This view is misdirecting and inconsistent with the objectives of destitution lightening and food security.

Maxwell and Zziwa (1992), Mbiba (2003), have discovered that the training isn't restricted to destitute individuals living in casual settlements or late transients to urban communities. Every social class, comprising those utilized and functioning in the official division, takes part in the movement. What shifts is the degree and motivation behind investment in the action? The modernization hypothesis is consequently important to this examination as it will look to investigate how UPA influences family nourishment security

2.3.2 Von Thunen's theory

Thunen's theory states that openness to the market can make a total arrangement of horticultural land utilize. In his theory, he asserted that the pattern of land use relied on the forces of rivalry between different kinds of horticulture to utilise a given bundle of land in which the deciding element is the financial lease which is the return on investing inland. Rodrigue (2013) concurred and stated that the use of land provided the greatest economic rent. Besides, since transportation costs expanded with separate, they granted a spatial variety to Economic Rent.

According to Rodrigue, (2013), at the market to a great degree, escalated utilize result in an expanded generation pays off in greater Economic Rent. With more noteworthy separation from the marketplace, these escalated arrive utilize turns out to be less plausible, because rising transport costs offset the advantages of increased per-hectare production. This theory can be linked to the contribution of UPA on domestic food security as it seeks to address the production of agricultural products, market issues, and land usage.

2.4 Conceptual Framework

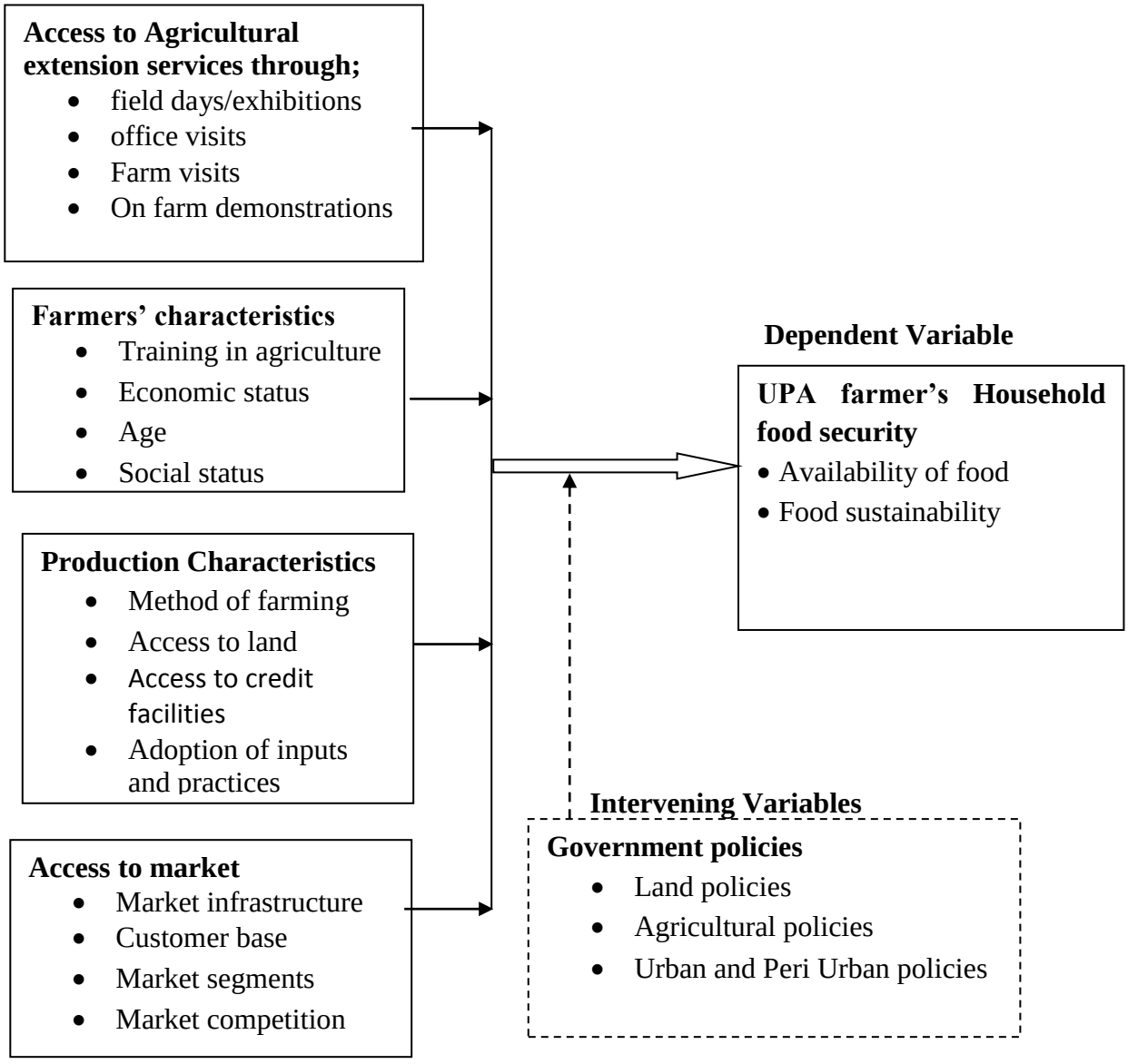
There are four independent variables selected for this study: extension services, production characteristics, farmer's characteristics access to market marketing of urban and peri-urban crops produced in Kericho County. These variables were selected to check their influence on UPA and food security of farmers in Kericho County.

In the conceptual framework, we also have one moderating variable, which also behaves as the independent factor in that it has a huge contributory or unforeseen impact on the relationship between the dependent and independent variable. The researcher is aware of the influence the Government policies have on UPA, and food security takes into account their effects by asking farmers in the questionnaires to list the challenges they face in order of priority. The conceptual framework is depicted in Figure 2.1

Figure 2.1

Conceptual Framework of the Factors influencing the contribution of Urban and Peri-urban Agriculture to Household Food Security in Kericho County, Kenya

Independent Variables



2.5 Identification of Knowledge Gap

The inception of the general population associated with urban agribusiness changes broadly as does farming's commitment to urban employments. Urban agriculture handlers can be cultivating families that have step by step turned out to be consumed

by the extending city and regularly adjust their cultivating frameworks to new urban openings, similar to closeness to business sectors with better chances to gather advertising data and to offer specifically to urban purchasers or retailers. Despite these openings, some urban and peri-urban and urban makers keep on having a 'country standpoint' and need support to use new markets and market channels (Arce *et al*., 2007). They can likewise be compelled by other, negative changes, particularly the loss of standard land rights, intense rivalry, quarrying activity, control and political pressure.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the methods that were utilized to gather relevant data. It starts with the inquiry design suggested for the study. It also describes the scope of the study, the study population, the study sample and sampling techniques, instruments for data collection, validity and the reliability of the instruments and finally, data analysis.

3.2 Research Design

The study was based on a descriptive research design. Descriptive research is applied to get data regarding the current position of the marvels to describe what exists as for aspects or circumstances in a context (Chandran, 2004). This design was chosen because it helps answer the questions; what, why, when, where and how? And thus provide in-depth insights into the matter being investigated. Therefore, this research design was used to make inferences about the factors influencing UPA and household food security of Farmers in Kericho County through studying a representative sample of the population.

3.3 Location of the Study

The study was undertaken in four major towns within the four sub-counties of Kericho. Kericho is one of the fourty seven counties in Kenya. The County is bordered by Uasin Gishu County to the North, Baringo County to the Northeast, Nandi County to the Northwest, Nakuru County to the to the east and Bomet County

to the South. It is bordered to the South West by Nyamira and Homa Bay Counties and to the West by Kisumu County.

The four sub-counties of Kericho where the study was undertaken are Litein, Kericho, Kipkelion and Londiani. Kericho County has four major towns, namely Kericho, Kipkelion, Londiani and Litein, with the estimated population being 9000. Farming is the county's dominant activity with tea forming the largest agricultural activity. Land tenure in the county comprises the majority of individual owners who are small scale farmers.

3.4 Target Population

The target populace for the study was UPA agriculturists in Kericho County. A population is a multifacet characterized or set of persons, adminstration, constituents, occasions, and a collection of things or household units under inquiry. There were two target populations for this study. The first population were 3487 UPA farmers in Kericho County of different age, gender, educational level, according to the Ministry of Agriculture and Fisheries, Economic reviews (2015). The second population were 30 extension staff agents involved in UPA activities. Therefore, the researcher targeted 3487 Urban and peri-urban agriculturalists and 30 extension agents.

Table 3.1

Target Population of urban and peri-urban farmers, and extension staff by location

UPA area	Female Farmers	Male Farmers	Extension staffs	Total
Kericho	621	850	10	1,471
Kipkelion	430	485	5	915
Londiani	271	210	5	481
Litein	300	320	10	620
Total	1,622	1, 865	30	3,487

3.5. Sample Size and Sampling Procedures

3.5.1 Sample Procedure

This study's sample scope was determined by using Krejcie and Morgan (1970) table of defining sample magnitude from a specified target population (Shown in Appendix III). The sample size corresponding to the respective target population was 341 UPA farmers. Extension staffs were not sampled because they are less than 30 in number. Therefore, all 30 took part in the study.

3.5.2 Sampling size

The study used a proportionate stratified random sampling to choose a sample of 341 UPA farmers. The UPA areas formed the strata.

The sample size per category is shown in Table 3.2

Table 3.2

The sample size for the urban and peri-urban farmers by location

UPA Area	Target Population	Sample Size		Total
		Male	Female	
Kericho	1471	62	85	147
Kipkelion	915	43	48	91
Londiani	481	27	21	48
Litein	620	30	32	62
Total	3487	159	182	341

3.6 Data Collection Instruments

The study used interview plans and questionnaires to gather data. Kothari (2014) noted that the use of questionnaires had been widely utilized as a part of a scope of

business and other related research because of its fair-minded nature and capacity to reach and get a response from many respondents.

The interview schedule was utilized to gather data from the Ministry of Agriculture staff. The interview schedules are preferred because they were easy to interpret and complement the questionnaire items, making them clear and understandable.

On the other hand, the questionnaire was considered appropriate for the farmers because they provide confidentiality. The first section of the questionnaire contained section A, which presents the background and demographic information about respondents, section B collected information on access to agricultural extension services; section C collected information on farmer's characteristics, section D presenting production characteristics and section E presenting the influence of access to the market on household food security. Open-ended or unstructured questions allow the researcher to provide a complete picture of the respondent's feelings and attitude.

3.6.1 Validity of the instruments

The study used content rationality to check the strength of the questionnaire. This involves examining the items contained in the questionnaires in terms of contents (Straub and Boudreau, 2004). The research instruments' validity was resolute by giving the instruments the two specialists at the University of Kabianga. The specialists have a long understanding of teaching and overseeing postgraduate students. Their remarks were combined in the research instrument. Area of specialization was used to select the experts. The expert's opinions were considered in revising the questionnaire items (Mutai, 2003).

3.6.2 Reliability of the instruments

The consistency of a research instrument is the degree to which any estimating methodology produces similar outcomes on multiple trials (Mugenda and Mugenda, 2008). The consistency of the questionnaire was determined by pretesting the instruments in Bomet town, Bomet County, with 30 respondents who did not take part in the actual study because Bomet was not the location of the final study. Whereas the interview schedule was not subjected to reliability tests because the Agriculture Department staff was few. Cronbach's alpha coefficients were used to calculate the reliability coefficient which gave 0.87 which was good enough. A minimum score of 0.7 was considered reliable. Cooper and Schindler (2008) prescribe a character more than 0.7 to be an adequate dependability figure. If the dependability is below 0.7, the instrument was reexamined and piloted over till a satisfactory score is attained.

The questionnaire was pre-tested to check its completeness and structure to get rid of any errors and ambiguity of the items. This was done to ensure that the questionnaire was reliable before administering it to the actual study. The piloting was done after which errors emanating were corrected, and cases of ambiguity were dealt with by reviewing the content. The coefficients of Alpha were calculated using the Cronbach's formula as follows:

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N-1) \cdot \bar{c}}$$

Where:

α -Alpha coefficients

N- the number of questionnaire items

C-bar is the variance among items contained in the questionnaire

V-bar equals the average variance.

Mugenda and Mugenda (2003) argued that the data collection instrument is reliable if the calculated alpha coefficient is > 0.7. The study used the following criteria to interpret the findings on reliability, as shown in Table 3.3.

Table 3.3

Cronbach's Alpha Coefficients for the Pilot Study

Cronbach's alpha (Threshold)	Remark
$0.9 \leq \alpha$	Outstanding
$0.8 \leq \alpha < 0.9$	Good
$0.7 \leq \alpha < 0.8$	Satisfactory
$0.6 \leq \alpha < 0.7$	Doubtful
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Intolerable

3.7 Data Collection Procedures

Before data collection, a research permit was obtained from the National Commission of Science Technology and Innovation (NASCOTI) via an introductory note from the graduate studies, University of Kabianga. The permit was presented to the County Director of Agriculture to explain the purpose of the study. The scholar sought informed consent with the staff and farmers before issuing the data collection instruments, and after that, they were given two weeks to respond to the questionnaires. A total of 341 questionnaires were administered, and 298 questionnaires were returned, representing a response rate of 76.5%. The staffs working in the agriculture department were also informed about the need to have an interview with them, and thereafter, the appointment was sought. The researcher

conducted the interviews within the agreed time, where all the targeted staff responded to the interviews.

3.8 Data Analysis and Presentation

Before data analysis was done, the researcher inspected data pieces to check for completeness and accuracy. Those that were incomplete were discarded. Objective one to four were analysed using frequencies and percentages. After that, the codebook was developed for based on the dataset. The data were finally entered into SPSS version 21.0 for analysis. Objective 1 to 4 was analyzed. The data were subjected to an analytical model to test the association of the variables investigated. Each hypothesis was tested using Chi-Square at 0.05 alpha levels. The chi-square test reveals the strength of association between independent and dependent variables.

3.8.1. Analytical model

To determine the most influential factors contributing to urban and peri-urban farming and household food security in Kericho County, multiple regression model was used as described below.

$$Y= \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3+ \beta_4X_4 + \varepsilon$$

Where: Y= Factors influencing the contribution of urban and peri-urban agriculture to household food security in Kericho County.

X_1= Extension Services

X_2= Access to Market

X_3= Farmers' Characteristics

X_4= Production Characteristics

ε = Random Error

Table 3.4

Summary of data analysis per research hypothesis

Hypothesis	Independent variable	Dependent variable	Statistic test
H1. There is no statistically significant influence of the adequacy of land on the contribution of UPA on household food security in Kericho County	Adequacy of land	Household food security	Chi-Square test at 0.05
H2. There is no statistically significant influence of farmer characteristics on the contribution of UPA on household food security in Kericho County	Farmer characteristics	Household food security	Chi-Square test at 0.05
H3. There is no statistically significant influence of production characteristics on the contribution of UPA on household food security in Kericho County	Production Characteristics	Household food security	Chi-Square test at 0.05
H4. There is no statistically significant influence of access to the market on the contribution of UPA on household food security in Kericho County	Access to market	Household food security	Chi-Square test at 0.05

3.9 Ethical Considerations

The research was done ethically, ensuring fidelity, justice and avoiding plagiarism. The responses were utilized to resolve the research only and were subjected to a lot of confidentiality. The findings of the study were shared with the respondents. Access to this information by any other person will require full authorization by the University of Kabianga.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The preceding chapter dealt with research design, target population, sampling, instrumentation, data collection, and analysis. This chapter presents the results, interpretation and discussion of the findings.

The objectives that this study considered were:

i. To determine the influence of access to extension services on the role of Urban and Peri-urban Agriculture to the household food security in Kericho County.
ii. To determine the influence of farmer characteristics on the contribution of Urban and Peri-urban Agriculture to household food security in Kericho County.
iii. To determine the influence of production characteristics to the contribution of Urban and Peri-urban Agriculture to household food security in Kericho County
iv. To determine the influence of farmer's access to the market on the contribution of Urban and Peri-urban Agriculture towards household food security in Kericho County.

The following hypotheses were tested, and the results will be reported in this chapter:

$H_0$1.There is no statistical significant relationship between access to extension services and the contribution of urban and Peri-Urban agriculture on food security in Kericho County.

$H_0$2.There is no statistical significant relationship between the characteristics of farmer of urban and Peri-Urban and household food security in Kericho County

$H_0$3.There is no statistical significant relationship between production characteristics of urban and Peri-Urban on household food security in Kericho County

$H_0$4. There is no statistical significant relationship between market access by farmers of Peri-Urban and household food security in Kericho County.

Data analysis was performed in two stages and concentrating on a single cluster of variables at a time. The first step was to obtain descriptive statistics such as frequency and mode for each variable. The objective of the second stage was to obtain chi-square between each autonomous variable and dependent variable.

The presentation of the results was done in the order in which the objectives were stated but preceded by the characteristics of the respondents.

4.2 Questionnaire Return Rate

From the entire of 341 questionnaires which were administered, 298 questionnaires were returned, representing a response rate of 76.5%. The results are shown in Table 4.5.

Table 4.5

Response Rate of respondents

Response	Frequency	Percentage
Expected responses	341	100
Received responses	298	76
Un-received	43	14

The questionnaires were administered, then the respondents were allowed time to complete them and thereafter they were collected. The reason for this was that the method used to allocate questionnaires was a drop-and-pick technique where the scholar distributed the questionnaires and waited for the respondents to complete it and took back the filled questionnaires. According to Kothari (2004), it is assumed

that feedback rating at 50% is considered as average, 60-70% is satisfactory while above 70% is an outstanding rate of response. This response rate was regarded as an excellent illustration of the respondent to give information for examination and generation of effective conclusions. The sample size was illustrative of the initial sample to a high degree, ensuring the validity of the findings. The outcomes of the findings are presented in Table 4.1.

Furthermore, 30 officials from the department of agriculture were reached for the interview, whereby they gave more insights on questions contained in the questionnaires.

4.3 Background Information of the Respondents

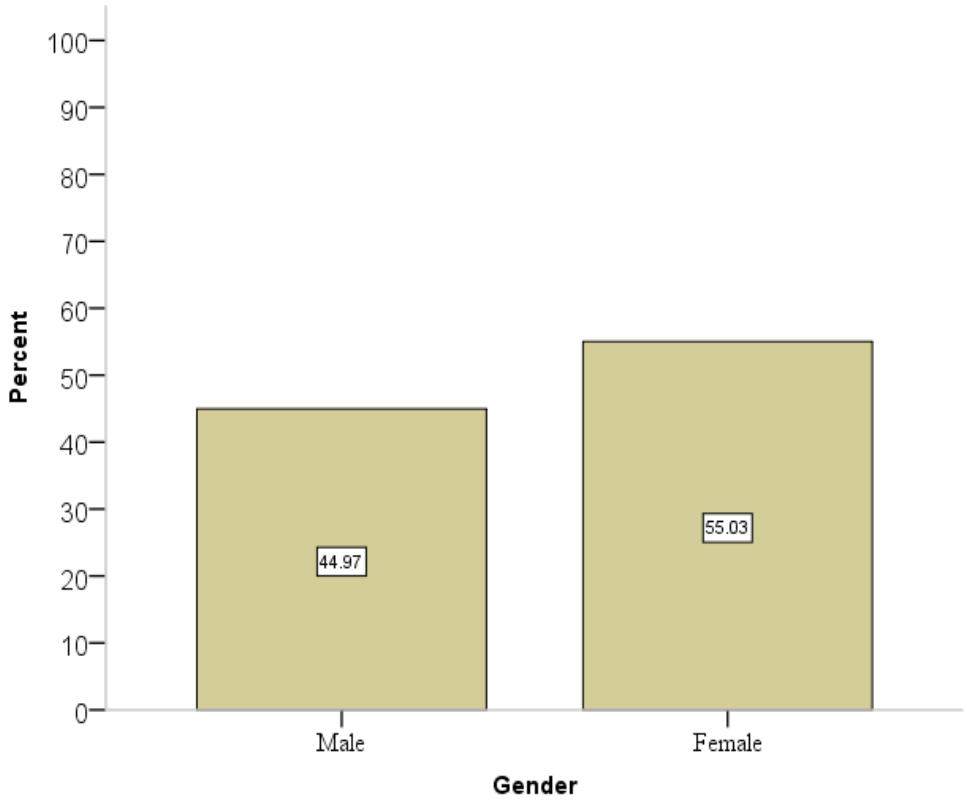
In this area, the respondents' gender, location of residence and the nature of Urban and Peri-urban Agriculture they practised in terms of either full or part-time basis are discussed.

4.3.1 Distribution of respondents by gender

In order to determine the gender of farmers engaged in urban and peri-urban farming, the respondents were requested to specify their sex and the responses captured are shown in figure 4.1.

Figure 4.1

Respondents gender per percentage



The findings reveal that many of respondents practising urban and peri-urban farming were females as shown by the 55.03% of the female response rate compared to 44.97% male. However, the margin between the two categories is not that large, and this shows that both genders are actively involved in urban and peri-urban farming. The findings disagree with the findings of Mwangi (2017) who found out that majority of those who practised UPA were masculine.

4.3.2 Distribution of respondents by age

The researcher pursued to institute the age of the respondents. The findings are shown in Table 4.6.

Table 4.6

Distribution of respondents by age

	Frequency	Percentage
Below 25 years	27	9.1
26-35 years	69	23.2
36-45 years	106	35.6
46-55 years	72	24.2
Over 55 years	24	8.1
Total	298	100.0

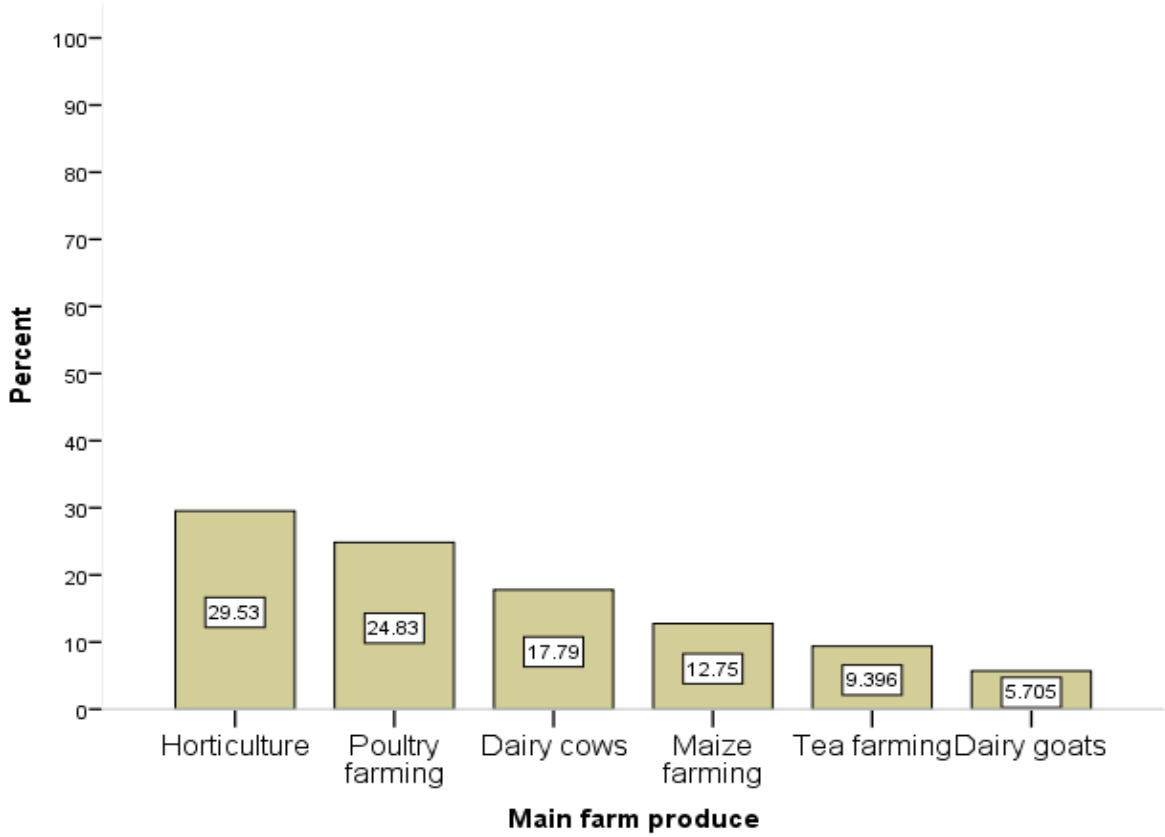
The results reveal that majority of the respondents 35.6% were aged 36-45 years, 24.2 out of a hundred aged 46-55 years, 23.2 out of a hundred aged 26-35 years, 9.1% aged below 25 years and 8.1% were over 55 years. The findings implied that the majority of those who practised urban and peri-urban farming were between 36-45 years. This suggests that most farmers were aged 36 years and above, implying that younger farmers are more willing to engage in urban agriculture than older ones. It may also infer that urban agriculture is a recent phenomenon.

4.3.3 Distribution of respondent's by farm produce

The study pursued to come up with the nature of urban and peri-urban farming practised by agriculturalists in Kericho County, and the outcomes were as shown in Figure 4.2.

Figure 4.2

Distribution of types of farming in UPA per percentage



The results reveal that 29.53% of the respondents practice horticultural farming, 24.83% poultry farming, and 17.79% kept dairy cows, 12.75% maize farming, 9.396 tea farming and 5.705% dairy goats. This means that majority of the farmers in Kericho County mainly practice horticulture and poultry farming in urban and peri-urban such as Kericho town, Londiani, Kipkelion and Litein. The finding agrees with that of Ravertz (2000) who found out that urban area farmers produced horticulture and poultry products which provide household food security. He further found out that urban nourishments can be diverse and of more nutrition benefits than the rural ones for individuals who have ways of accessing various food.

4.3.4 Distribution of respondent's by experience

As indicated in Table 4.7, 37.6% had an experience of 6-9 years, 22.8% had 2-5 years, 22.5% had 10-12 years, 10.7% had over 12 years and 6.4 had less than one year of experience.

Table 4.7

Respondent's by experience in UPA by frequency

	Frequency	Percentage
Less than 1 year	19	6.4
2-5 years	68	22.8
6-9 years	112	37.6
10-12 years	67	22.5
Over 12 years	32	10.7
Total	298	100.0

This is a signal that a substantial number of the respondents had undertaken Urban and Peri-urban Agriculture for a significant period of time, and consequently, they were in a spot to provide dependable info relevant to this study. This indicates that many of the participants had enough knowledge of Urban and peri-urban farming.

4.3.5 Distribution of respondent's by education

The participants were requested to specify their peak educational level; the results are shown in Table 4.8.

Table 4.8

Respondents education level

	Frequency	Percentage
Illiterate	17	5.7
KCPE	20	6.7
KCSE	123	41.3
Diploma	60	20.1
Degree	60	20.1
Masters	18	6.0
Total	298	100.0

From the study results, 41.3% of the respondents had attained KCSE level, 20.1 had a college diploma and degree credentials, while 6.7% of the participants showed they had achieved KCPE level, and 6% of the participants showed they had reached masters level of education. This suggests that many of the participants were well-educated, and consequently, they were in a position to answer the study question with comfort. The findings differ with that of Kenya Economic Survey (2013), which reported that those who practised Urban and Peri-urban Agriculture had fairly low education achievement as compared to middle-income nations. Nearly 65% of the population had only primary or half-finished secondary education, whereas 10% has never been to school.

4.3.8 Rating of the various modes of communication utilized by farmers

The study also pursued to institute the most frequently used medium for receiving information. The findings are shown in Table 4.9.

Table 4.9

Rating of the various modes of communication utilized by farmers practising UPA

Communication medium	Frequency	Percentage
Radio	52	33.34
Television	47	30.20
Phone	51	33.21
Internet	6	3.25
Total	282	100.0

The findings reveal that 33.34% of respondents relied on radios to receive information about farming, 33.21% depended on phones, and 30.20% depended on television while the remaining 3.25% relied on the Internet. This means that farmers are in touch with the outside world regarding the information on how they can improve productivity in their pieces of land. It is also worth noting that very few farmers make use of the internet as a basis of information. Thus it will be prudent for them to do so in order to harness the Internet as a key source of very recent information regarding how they can boost productivity. The findings conclude that majority of the UPA farmer's access information relating to agriculture via television and radio as representing 63.54%.

4.3.9 Produce by the farmers

Farmers were asked to indicate the type of produce from their farms, and the findings were as indicated in Table 4.10.

Table 10

Type of produce from UPA by percentage

	Type of diet	Frequency	Percentage
Valid	Proteins	43	14.4
	Carbohydrates	127	42.6
	Vitamins	117	39.3
	Minerals	11	3.7
	Total	298	100.0

Table 4.10 shows that many of the participants 42.6% produced carbohydrates, 39.3% produced vitamins, 14.4% produced proteins, and 3.7% produced minerals. The findings concluded that the majority of the urban and peri-urban farmers produced carbohydrates.

4.3.10 Level of production of proteins

The participants were requested to specify the level of adequacy of proteins they produced, and the outcomes were as shown in Table 4.11.

Table 4.11

Level of production of proteins from UPA by percentage

Categories	Frequency	Percentage
Adequate and sufficient	117	39.3
Not adequate but sufficient	48	16.1
Not adequate and not sufficient	83	27.9
Not available	50	16.8
Total	298	100.0

Table 4.11 reveals that majority of the respondent's 39.3% mentioned that the protein they produced, were adequate and sufficient, 27.9% not adequate and not sufficient, 16.1% not adequate but sufficient and 16.8% not available. It was concluded from the

findings that the proteins produced by the farmers in Urban and Peri-urban Agriculture were adequate and sufficient. This was accredited to the reality that many of the farmers own small pieces of land which can only permit rearing of poultry and dairy cows.

4.3.11 Level of production of Carbohydrates

The participants were also requested to specify the level of adequacy of carbohydrates they produced, and the results were as shown in Table 4.12.

Table 4.12

Level of production of Carbohydrates from UPA by percentage

	Categories	Frequency	Percentage
Valid	Adequate and sufficient	43	14.4
	Not adequate but sufficient	88	29.5
	Not adequate and not sufficient	91	30.5
	Not available	76	25.5
	Total	298	100.0

Table 4.12 shows that 30.5% of the participants showed that the level of production of carbohydrates was not adequate and not sufficient, 29.8% not adequate but sufficient, 25.5% not available and 14.4% adequate and sufficient. It was deduced from the findings that the production of carbohydrates in Urban and Peri-urban Agriculture was not adequate and not sufficient.

4.3.12 Level of production of Vitamins

The participants were also requested to show the level of adequacy of vitamins they produced, and the results were as shown in Table 4.13.

Table 4.13

Level of production of Vitamins from UPA by percentage

Categories	Frequency	Percentage
Adequate and sufficient	127	42.6
Not adequate but sufficient	56	18.8
Not adequate and not sufficient	80	26.8
Not available	35	11.7
Total	298	100.0

Table 4.13 indicated that 42.6 out of a hundred of the participants mentioned that production of vitamins was adequate and sufficient, 26.8%, not adequate and not sufficient, 18.8% not adequate but sufficient and 11.7% not available. It was concluded from the findings that the production of vitamins was adequate and sufficient.

4.4 Inferential Statistics of the Independent Variables

The preceding section dealt with background characteristics of the respondents such as gender, age, experience, educational attainment, modes of communication and type of crops. This section will concentrate on displaying results per objective, followed by interpretations and discussions.

The presentation of the results will be done in the following order:

i. Access to extension services
ii. Farmer characteristics
iii. Production characteristics
iv. Access to market
v. Regression analysis results

Results for each objective will be presented first and then followed by hypotheses test results for the objective. In the end, regression analysis results will be presented.

4.4.1 Access to extension services

Access to agricultural extension services was established to be very significant in agriculture, and the participants were requested to specify the degree to which they accessed agricultural extension services through various channels and the findings were as shown in Tables 4.14

Table 4.14

Agricultural extension channels for urban and peri-urban farmers

Extension channels	5	4	3	2	1	Mean	Std deviation
a) Farm radio broadcasts(specify)	38.6	25.1	11.7	11.1	13.5	3.6140	1.42
b) Visited by frontline extension staff worker	26.9	12.0	36.5	19.1	15.5	3.5906	1.43
c) Farm newspaper	29.8	38.0	7.6	12.1	12.5	3.5906	1.39
d) Field demonstrations	11.7	26.3	36.8	11.7	13.5	3.6784	1.35
e) Field days	34.8	27.1	12.3	11.7	14.0	3.9123	1.25
f) Agricultural shows	11.1	30.4	33.3	11.1	13.5	3.7544	1.38
g) Barazas where farming was talked about	33.9	35.1	7.0	12.9	11.1	3.6140	1.42
h) Contact farmers	7.0	11.1	7.0	33.3	41.5	3.5906	1.43

As shown in Table 4.11, 38.6% of the respondents most of the time access agricultural extension services through Farm radio broadcasts such as shamba Shape up, showing a mean of 3.1640 and a standard deviation of 1.39; 36.5% who were majority were once in a while visited by frontline extension staff worker showing a mean of 3.5906 and a standard deviation of 1.43; those who sometimes accessed the farm newspaper were 38.0% showing a mean of 3.5906 and standard deviation of 1.39; many of the participants once in a while accessed agricultural extension services through field demonstration showing a mean of 3.6784 and 1.35; 34.8% of the respondents accessed agricultural extension services through field days showing a mean of 3.9123 and a standard deviation of 1.25; agricultural shows were found to be accessed once in a while by the majority of the farmers 33.3% showing a mean of 3.7544 and a standard deviation of 1.38. It was also exposed that farmers sometimes accessed farming barazas representing 35.1 out of a hundred of the participants showing a mean of 3.6140 and a standard deviation of 1.42. Furthermore, 41.5% of the respondents were contacted by agricultural extension officers showing a mean of 3.59 and a standard deviation of 1.43.

The hypothesis corresponding to this objective stated that "*There is no statistical significant relationship between access to extension services and the contribution of urban and Peri-urban agriculture on food security in Kericho County".* The data were subjected to chi-square to determine the statistical relationship amongst access to agricultural extension and household food security. The outcomes are shown in Table 4.15

Table 4.15

Chi-square results of access to agricultural extension and household food security

Variable	N	Chi-square value x^2	Significant level (P-0.05)
Access to agricultural extension	298	616.087	0.000

Table 4.15 revealed that the chi-square test between access to extension services and household food security was ($p=0.001<0.005$). Since this value is less than 0.05, the study fails to rejects the null hypothesis that there is no statistically significant influence of access to extension services on the contribution of Urban and Peri-urban Agriculture on household food security and accept the alternative hypothesis that "There is a statistically significant influence of access to extension services on the contribution of Urban and Peri-urban agriculture on household food security in Kericho County.

4.4.2 Farmer characteristics

Farmers characteristics were also considered important in the study, and the aspect tested includes farmers education level, income levels and social status. The results on education level were as presented below.

4.4.2.1 Farmer education level

The study also set out to determine the education attainment of farmers. The participants were requested to show their peak level education and the outcomes are shown in Table 4.16.

Table 4.16

Education level of urban and peri-urban farmers

Educational level	Frequency	Percentage
Primary	26	16.7
Secondary	85	54.5
College/vocational	40	25.6
University	3	1.9
Post-graduate	2	1.3
Total	282	100.0

The findings reveal that 85% of respondents had attained secondary school education, 40% had a college education, 26% of them had attained primary level education, and 3% had a university-level qualification while the remaining 2% had achieved post-graduate level education. These findings show that many agriculturalists engaged in urban and peri-urban crop farming in Kericho County had post-primary school qualification, although a very small number had a university and post-graduate education.

4.4.2.2 Farmer's income level

The researcher also sought to determine the income which farmers managed to realize from selling their farm produce. The results are shown in Table 4.17.

Table 4.17

Average income from farm produce by percentage for urban and peri-urban farmers

	Income	Frequency	Percentage
Valid	Kshs. 10,000	22	7.4
	Kshs. 11000-15000	40	13.4
	Kshs. 16000-20000	39	13.1
	Kshs. 21000-25000	86	28.9
	Kshs. 26000-30000	88	29.5
	Kshs. 31000-35000	10	3.4
	Over Kshs. 36000	13	4.4
	Total	298	100.0

Table 4.17 reveals that 29.5 out of a hundred of the participants earned Kshs. 26000-30000, 28.9% earned Kshs. 21000-25000, 13.4% earned Kshs. 11000-15000, 13.1% earned Kshs. 16000-20000, 7.4% earned Kshs. 10,000, 4.4% Over Kshs. 36000, and 3.4% earned Kshs. 31000-35000. The findings imply that the majority of the farmers earned an average of Kshs. 26000-3000 a month from farm produce. The findings agree with the research done by Githugunyi (2014), who found that the majority of urban and peri-urban farmers get food supplements.

The hypothesis corresponding to this objective stated that "*There is no statistical significant relationship between the characteristics of farmer of urban and Peri-Urban and household food security in Kericho County*" The data were subjected to chi-square to determine the statistical association between farmer characteristics and household food security. The results are displayed in Table 4.18

Table 4.18

Chi-square results of farmer characteristics and household food security

Variable	N	Chi-square value x^2	Significant level (P-0.05)
Farmer's characteristics	298	615.983	0.003

As revealed in Table 4.18, the chi-square test shows P=0.003<0.05. Since this value is less than 0.05, the study fails rejects the null hypothesis that there is no statistically significant influence of farmer characteristics on the contribution of UPA on family food security and accept the alternative hypothesis that "There is a statistically substantial influence of farmer characteristics on the contribution of UPA on household food security in Kericho County.

4.4.3 Production characteristics

Production characteristics were considered an important aspect in the research, and the participants were requested to show the various aspects of their production such as land size, land ownership and access to farm inputs. This addressed the third objective of the research. The results of the study on land size are shown in Table 4.19.

Table 4.19

Size of land under production by urban and peri-urban farmers

	Frequency	Percentage
Over one acre	35	11.7
One acre	60	20.1
Half acre	67	22.5
Quarter acre	136	45.6
Total	298	100.0

The outcomes in Table 4.19 indicated that 45.6% of the participants utilized a quarter acre piece of land for agriculture, while 22.5% used half an acre. 20.1% of the respondents did farming on a one-acre piece of land, and 11.7% used over one acre for farming. The finding implies that the majority of the urban and Peri-urban areas do farming on small pieces of land and therefore, they produce little for sale. These are similar to the findings by Van Averbeke (2007), which demonstrate that home-based gardens in the municipal areas of African are crucial for the growing crops. These are deliberately cultivated for individual consumption, although excesses can be traded.

The participants were additionally probed to specify the ownership of the land they used for farming, and the results were as presented in Table 4.20.

Table 4.20

Ownership of land by urban and peri-urban farmers by percentage

	Frequency	Percentage
Own	214	71.8
Lease	66	22.1
Free space	18	6.0
Total	298	100.0

The outcomes in Table 4.20 exposed that 71.8% of the participants own the land they were farming, 22.1% owned the land through lease and 6.0% utilized free space available for farming. The study concluded from the findings that most farmers in urban and Per-urban areas own land. The findings align with Mougeot (1994) who found out that approximately 40% of Africans who live in town practised agriculture, largely dictated by the availability of land off-the plot, on-the plot which may be owned by an individual, government or group.

The findings further asked the respondents to indicate access to various land inputs, and the outcomes were as shown in Table 4.21.

Table 4.21

Access to various inputs by of urban and peri-urban farmers in percentages

		Frequency	Percentage
Valid	Access to capital	114	38.3
	Access to credit	14	4.7
	Access to commercial fertilizer	26	8.7
	Access to organic fertilizer	109	36.6
	Access to certified input	35	11.7
	Total	298	100.0

The outcomes of the study revealed that 38.3% of the respondents in Urban and Peri-urban had access to capital, 36.6% had access to organic fertilizer, 8.7% had access to commercial fertilizer and 4.7% had access to credit. The findings of the study implied

that the availability of capital made the majority of the farmers to undertake Urban and Peri-urban Agriculture.

The hypothesis corresponding to this objective stated that *"There is no statistical significant relationship between production characteristics of urban and Peri-Urban on household food security in Kericho County"*. The results are displayed in Table 4.22

Table 4.22

Chi-square results of production characteristics and household food security

Variable	N	Chi-square value x^2	Significant level (P-0.05)
Production characteristics	298	616.881	0.000

As shown in Table 4.22, the chi-square test shows P=0.000<0.05. Since this value is less than 0.05, the study rejects the null hypothesis that there "There is no statistically significant influence of production characteristics on the contribution of Urban and Peri-urban Agriculture on household food security in Kericho County" and accept the alternative hypothesis that "There is statistically significant influence of production characteristics on the contribution of Urban and Peri-urban Agriculture on household food security in Kericho County".

4.4.4 Access to market

Access to market place allows the distribution of agricultural products, and it was considered important in the study. The participants were also requested to give their responses to various market access indicators. The outcomes were as indicated in Table 4.23.

Table 4.23

Market access for farm produce by percentage

	Frequency	Percentage
Supermarket	23	7.7
Open Market Centers	104	34.9
Neighbourhood	53	17.8
Middlemen	56	18.8
Markets outside the county	62	20.8
Total	298	100.0

The results show that 34.9% of respondents produced for the open market, 20.8% sells the produce outside the county, 18.8% sells their produce to the middlemen, 17.8% sells their produce to the neighbourhood, and 7.7% sells their produce to the supermarkets. This implies that most farmers produced for local consumption while the rest were sold to various market outlets. Local consumption is significant as it helps alleviate food insecurity. On the other hand, the export of produce ensures more income to the farmer given competitive prices offered at the international market. Furthermore, the country is able to earn a substantial foreign currency due to the export business. The findings are in line with that of Kinuthia (2008) who found out that urban farming has the possibility to flourish in most recent municipalities of the world, because of its diverse roles and links with city issues. Cities offer easy access to the market place and the dominant high demand for food.

The hypothesis corresponding to this objective stated that *"*There is no statistical significant relationship between market access by farmers of Peri-Urban and household food security in Kericho County*."* The results for the chi-square test are presented in Table 4.24.

Table 4.24

Chi-square results of access to market and household food security

Variable	N	Chi-square value x^2	Significant level (P-0.05)
Access to market	298	639.701	0.000

As shown in Table 4.24, the chi-square test shows P=0.000<0.05. Since this value is less than 0.05, the study fails rejects the null hypothesis that there "there is no statistically significant influence of access to the market on the contribution of Urban and Peri-urban Agriculture on household food security in Kericho County" and accept the alternative hypothesis that "there is a statistically significant influence of access to the market on the contribution of Urban and Peri-urban Agriculture on household food security in Kericho County.

4.5 Regression analysis of the factors influencing the contribution of UPA to household food security

The coefficient of each variable is as indicated in Table 4.25.

Table 4.25

Summary of results on the influence of agricultural productivity on food security

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error	Beta		
(Constant)	1.452	0.175		7.701	.003
Extension services	0.712	0.050	0.736	14.118	.001
Farmer characteristics	0.674	0.054	0.684	9.684	.003
Product characteristics	0.791	0.044	0.798	14.242	.003
Access to market	0.833	0.040	0.843	19.642	.004

Dependent variable: household food security

The coefficient for the intercept is 1.452 suggests that if the autonomous variables are equated to zero, then the household food security will improve by a margin of 1.452.

The results of the study found positive coefficients in all the variables: the findings revealed that a unit increase in extension services increases household food security by a margin of 0.712. The beta coefficient of farmer characteristics is 0.674, suggesting that a unit upsurge in farmer characteristics increases household food security by a margin of 0.674.

Likewise, the beta coefficient of Production characteristics is 0.791, meaning that production characteristics increase the household food security by a margin of 0.791. The beta coefficient of access to the market is 0.833 increases access to household food security by a margin of 0.833. The study concluded that extension services, farmer characteristics production characteristics and access to market had a positive relationship with household food security in Kericho County. The Results for the multiple regression model were as follows:

$$Y= 1.452 + 0.712X_1 +0.674X_2 + 0.791X_3+ 0.833X_4 + 0.05$$

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter presents the results of the study in summary form. This is followed by conclusions based on the research hypotheses. Lastly, the chapter presents the recommendation and areas for further study.

5.2 Summary

The purpose of this research was to identify aspects influencing the role of Urban and Peri-urban Agriculture (UPA) in household food security in Kericho County. The following research objectives directed the research; i) to establish the effect of extension services on the household food security; ii) to determine the effect of farmer characteristics (age, gender, education level, employment status, farm income) on food security; iii) to describe the influence of production characteristics (size of the land, land ownership, inputs) on household food security and iv) to analyse the influence of farmers' access to the market on the household food security.

A descriptive research design was used in the study. The targeted population comprised of 3487 Urban and peri-urban agriculturalists in Kericho County. A sample of 341 Urban and peri-urban agriculturalists was sampled using Multistage Sampling method. Data was eventually collected using a structured and unstructured questionnaire. Data were then analysed using frequencies and perentages while hypotheses were tested using Chi-square and regression analysis at 0.05 alpha level. The results revealed that a unit increase in extension services increases household food security by a margin of 0.712, and a unit increase in farmer characteristics

increases household food security by a margin of 0.674. Similarly, a unit increase in production characteristics increases household food security by a margin of 0.791, and unit increase in access to market increases access to household food security by a margin of 0.833.

From the outcomes of the research, it was revealed that extension services were statistically significant in influencing household food security in Kericho County. The results of the study revealed that farmer's characteristics, such as education level and income levels, were statistically significant in influencing household food security. Furthermore, production characteristics were also found to significantly influencing household food security. The study further discovered that the influence of access to the market on household food security has positive significant and the results of the chi-square found out that access to the market was statistically significant in influencing household food security. Finally, regression analysis test showed that all the independent variables had positive coefficients and therefore depicted close association with the independent variables.

5.3 Conclusions

5.3.1 Agricultural extension services

Based on the results of the research, most participants mostly access agricultural extension services through Farm radio broadcasts such as Shamba Shape up. Majority of the respondents once in a while accessed agricultural extension services through field demonstration. It was also revealed that farmers sometimes accessed farming barazas. However, the study found out that farmers were rarely contacted by agricultural extension officers

The study concluded that access to agricultural extension services by the agriculturalists in Urban and peri-urban areas was still very low with the most common channels of communication being radio and television and the farmers were least visited by field officers.

5.3.2 Farmers' characteristics

Regarding farmers' level of education, most (85%) had secondary school education while only a few (3%) had university and post-graduate qualifications. On the farmer level of management training, the majority (91%) lacked such training. Regarding record keeping, most farmers (63%) did not maintain any record. The most commonly kept record was the production record, as used by 75.4% of the interviewed farmers. The results also indicated that only 26.3% of farmers had been paid a visit by extension officers. It was also established that most farmers (96.8%) received information about how to boost productivity via available channels of communication which included the television, radio, internet and phones. The most frequently used channel for receiving such information was the radio while the least utilized was the Internet, with only 6% of them adopting it. The farmers' characteristics were concluded to largely dictates food security in Kericho County in that most farmers in urban and peri-urban setting produced milk, vegetables and other crops. It was also concluded that the majority of the farmers had basic education that may limit their capacity to produce more crops for sustainable food security

5.3.3 Production characteristics

On availability of food, most farmers (58%) indicated that their households had access to food. Regarding those who could not access food, all of them (100%) indicated that this happened at times. On food sufficiency, most farmers (62%)

recorded that they had sufficient food supplies. Regarding those who lacked food, 98.3% indicated that it happened occasionally. Finally, on food variety, most farmers (54%) recorded that they could not access a variety of foodstuff though this was noted to be occasionally happening. In addition, KShs 70459.74 was found to be the average income which a farmer earned from selling their produce. Furthermore, the findings indicated that most farmers (99%) made use of the soil medium to grow their crops. The study also found that the majority of farmers (62.8%) relied on the rain-fed method of watering their crops.

On the type of field utilized for crop production, it was found that most farmers (95.5%) did use open fields to cultivate crops. The majority of farmers (85%) never employed any machinery during crop production. Furthermore, findings from respondents showed that 49.4% of the respondents believed that the biggest challenge they faced during the growing period was the reliability of rainfall, 19.9% said it was the availability of fertilizers, 18.6% stated that it was the availability of water, 5.8% indicated that it was soil/media management, 3.8% indicated that it was the availability of machinery while the remaining 2.5% indicated that the most influential variable was a selection of the type of crop to grow. It was also concluded that most farmers in urban and peri-urban areas of Kericho do agriculture on small scales, and they rely on rain as a major source of water for farming. This greatly affected the types of crops produced and the quantity.

5.3.4 Access to market

Most farmers (82.7%) had no specific buyer for their produce, with (71%) of them targeting the local market. Most farmers (69.9%) sold their produce to direct consumers. Of significance, no farmer was found to be selling their produce to cooperatives. Furthermore, most farmers (80%) preferred to dispose of their produce

through market sellers and grain millers. On availability of storage facilities, very few farmers (29%) had this important resource, the general store and home store being the most adopted one. Also, most farmers (75%) lacked the means to preserve their produce. The packaging was the only value addition practice employed by some farmers (7.1%). However, the majority (92.1%) did not bother to add value to their produce. Most farmers (88%) stated that they experienced very few difficulties during the marketing of their produce. The nature of market difficulty found to be highly affecting the farmers was poor road network as recorded by 96% of them. On pricing, most farmers (80%) were not involved in setting prices of their produce. Furthermore, availability or seasonality of the produce was recorded as the most influential price determinant as captured by 50.6% of farmers. Other important price determinants included brokers and prevailing market prices. Lastly, it was concluded that access to the market by many farmers was still a challenge despite them being close to the market places. The study found that majority of the farmers was selling their produce to an individual for resale.

5.4 Recommendations

Based on the findings of this study, the following recommendations were made:

5.4.1 Agricultural extension services

Founded on the outcomes of the study, it is suggested that County Government department of Agriculture and other stakeholders provide capacity building to the farmers in the urban and peri-urban setting in order to enhance food security in the county. The county government of Kericho should also ensure effective delivery of extension services across all urban and peri-urban agricultural areas.

5.4.2 Farmers characteristics

It is also recommended that farmers in urban and peri-urban areas should diversify their productions in order to cater to the growing need to enhance food security. Farmers should utilize the available rains to maximize their production, given the fact that most parts of Kericho County receive an adequate amount of rainfall. It is recommended that farmers should utilize the available rains to diversify their farming activities.

5.4.3 Production characteristics

The findings imply that the majority of the urban and Peri-urban areas do farming on small pieces of land, and therefore, they produce little for sale. The findings of the study implied that the availability of capital made the majority of the farmers to undertake Urban and Peri-urban Agriculture. Therefore, it is recommended that financial institutions should support and empower farmers through the provision of credit facilities.

5.4.4 Access to Market

The study also recommends that farmers should be educated on the need to access the markets directly within their locations. This is to ensure that their produce fetches the maximum prices and ensure good distribution and exchange of various agricultural products within the available markets. The county government should establish a good market network for farmers by identifying markets for local production.

5.5 Suggestion for Further Research

It is endorsed that additional studies should be carried out on the effects of land productivity in Kericho County on food security. This is because the current study

scope was limited to the extension services, farmer's characteristics, production characteristics and access to market and thereby the scope can be broadened to other parts not dealt with by the study.

A similar study should be undertaken in other counties since there exist differences in climatic and weather conditions, and therefore, the findings may not be the same. Other counties may be endowed with different pedagogical capabilities and thus suitable for different crops and farming.

Finally, research should be carried out on the factors influencing urban and peri-urban farmers from accessing markets for their produce. This is because the present study found out that majority of the farmers sells their farm produce to individuals as opposed to accessing markets directly.

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APPENDICES

APPENDIX I :QUESTIONNAIRE FOR UPA FARMERS

I am a student of The University of Kabianga taking a Master of Science in Agricultural Extension. I am carrying out a research on the Factors Influencing the Contribution of Urban and Peri- urban Agriculture on Household Food Security in Kericho County; Kenya:

The purpose of this questionnaire is to obtain information on the Factors Influencing the Contribution of Urban and Peri-urban Agricultureon Household Food Security in Kericho County; Kenya. You are therefore requested to participate in this study by filling this questionnaire. The information you will provide were used solely for the purpose of this study and were treated with utmost confidentiality. Therefore fill free to respond to all the questions contained in this questionnaire to the best of your knowledge.

Yours sincerely

Richard Rotich

Reg. No: AGR/PGEX/002/10

Signature _____

SECTION A: DEMOGRAPHIC INFORMATION

1. What is your main farm produce? Please [√] where appropriate.

a) Horticulture [ ]

b) Poultry keeping [ ]

c) Dairy cows [ ]

d) Maize farming [ ]

e) Tea farming [ ]

f) Dairy goats [ ]

2. Do you practice farming fulltime?

a) Yes [ ]

b) No [ ]

3. What is your gender?

a) Male [ ]

b) Female [ ]

4. What is your age group?

a) Below 25 years[ ]

b) 26 – 35 years [ ]

c) 36 – 45 years [ ]

d) 46 – 55 years [ ]

e) Over 55 years [ ]

5. How many years have you been practicing Urban and peri-urban farming?

a) Less than 1 year [ ]

b) 2-5 years [ ]

c) 6-9 years [ ]

d) 10-12 years [ ]

e) Over 12 years [ ]

6. What is your highest level of education?

a) Illiterate [ ]

b) KCPE [ ]

c) KCSE [ ]

d) Diploma [ ]

e) Degree [ ]

f) Masters [ ]

7. What is your employment status?

a) Permanent [ ]

b) Part-time [ ]

c) Casual worker [ ]

d) Unemployed [ ]

8. What is the employment status of your spouse?

a) Permanent [ ]

b) Part-time [ ]

c) Casual worker [ ]

d) Unemployed [ ]

SECTION B: INFLUNCE OF ACCESS TO AGRICULTURAL EXTENSION SERVICES ON HOUSEHOLD FOOD SECURITY

9**.** Have you ever accessed agricultural extension services**?** Yes [ ] No [ ]

10. To what extent have you accessed agricultural extension services through the following channels in the last one year?

The responses are rated on a Linkart scale: Most of the Time (**MT**) = 5, some of the Time (**ST**) = 4, ONCE in a while (**OW**), = 3, Never, (**N**) =2 and Not aware (**NA**) =1. Please tick the option that best suits your opinion on the statement.

Extension channels	**5**	**4**	**3**	**2**	**1**
i) Farm radio broadcasts(specify)					
j) Visited by frontline extension staff worker					
k) Farm newspaper					
l) Field demonstrations					
m) Field days					
n) Agricultural shows					

o) Barazas where farming was talked about					
p) Contact farmers					

Any other comments?

……

……..

SECTION C: INFLUENCE OF FARMERS' CHARACTERASTICS ON HOUSEHOLD FOOD SECURITY

11. What is your highest level of agricultural training?

a) Seminars/workshops(1day) [ ]

b) Short courses (2weeks and above) [ ]

c) certificate [ ]

d) Diploma [ ]

e) Degree [ ]

12. What is your Economic status; off farm income per month

a) KShs.100,000 and above [ ]

b) Kshs.50000-99000 [ ]

c) Kshs.25000-49000 [ ]

d) Kshs.10000-24000 [ ]

e) Less than 10000 [ ]

f) Not applicable [ ]

13. How much money do you make from your farming?

a). Less than 10,000 Ksh [ ]

b). Between 11,000 – 15,000 Ksh [ ]

c). 16,000 – 20,000 Ksh [ ]

d). 21,000 – 25,000 Ksh [ ]

e). 26,000 – 30,000 Ksh [ ]

f). 31,000 – 35,000 Ksh [ ]

g). Over 36,000 Ksh [ ]

14. Social status

a) Age [ ]

b) Type of housing;

i. Permanent [ ]

ii. semi-permanent [ ]

iii. mud- walled [ ]

c) Transport method

i. Own car [ ]

ii. Boda boda [ ]

iii. Bicycle [ ]

iv. Walking [ ]

Any other information you want to share

……

……

SECTION D: INFLUENCE OF PRODUCTION CHARACTERASTICS ON HOUSEHOLD FOOD SECURITY

16. Do you have any training on agricultural production?

a) Yes [ ]

b) No [ ]

17. What is the size of land in acres/hectares is under production

a) Over one acre [ ]

b) One acre [ ]

c) half acre [ ]

d) Quarter acre [ ]

18. Do you own land under production

a) Own [ ]

b) Lease [ ]

c) Free space [ ]

19. Do you irrigate your produce?

a) Yes [ ]
b) No [ ]
c) Partial [ ]

20. Do have access to the following?
    a) Access to capital [ ]
    b) Access to credit [ ]
    c) Access to commercial fertilizers [ ]
    d) Access to organic fertilizers [ ]
    e) Access to certified input [ ]

Any other information you want to share

……

……

SECTION E: THE INFLUENCE OF ACCESS TO MARKET ON HOUSEHOLD FOOD SECURITY

21. What produce to you market?
    a) …….
    b) ……..
    c) ……
    d) ……..

22. Where do you sale your produce
    a) Supermarket [ ]
    b) Open Market centers [ ]
    c) Neighbourhood [ ]
    d) Middlemen [ ]
    e) Markets outside the county [ ]

23. How often to you sell your produce to these markets in the last one year?
    a) Very Often [ ]
    b) Often [ ]
    c) Sometimes [ ]
    d) Never [ ]

24. Do you access any of the following market infrastructures?
    a) Market sheds [ ]

b) Electricity [ ]

c) Cooling plants refrigerators [ ]

25. Types of roads to the markets

a) Tarmac [ ]

b) Murram [ ]

c) Footpaths [ ]

d) None [ ]

26. How accessible are the roads to the market

a) Very accessible [ ]

b) Accessible [ ]

c) Somehow accessible [ ]

d) Terribly inaccessible [ ]

e) None [ ]

SECTION F: FOOD SECURITY

27. How much of the following is produced on the farm per year?

a) Proteins Beans [ ] Eggs[ ] Milk [ ] Others [ ]

b) Carbohydrates Maize [ ] Millet [ ] Sorghum[ ] Others [ ]

c) Vitamins. Fruits [ ] Vegetables [ ] Others [ ]

d) Minerals Carrots [ ] Pumpkin [ ] Others [ ]

28. How much is consumed? Is it adequate and to what extend

e) Proteins Beans [ ] Eggs[ ] Milk [ ] Others [ ]

f) Carbohydrates Maize [ ] Millet [ ] Sorghum[ ] Others [ ]

g) Vitamins. Fruits [ ] Vegetables [ ] Others [ ]

h) Minerals Carrots [ ] Pumpkin [ ] Others [ ]

29. To what extend is the money obtained from UPA adequate to purchase other foodstuffs

The responses are rated on a Likart scale Adequate and Sufficient =5, Not Adequate but Sufficient =4, Not adequate and not sufficient = 3, Not Available = 2, and Do not Know = 1

Nutrient	Adequate and sufficient (last for more than 1 year)	Not Adequate but Sufficient (last for more than 6 months)	Not adequate and not sufficient (last for less than 3 months)	Not Available (last for less than 1 week)	Do not know
Proteins (Milk, Beans or Eggs)					
Carbohydrates (Maize, Wheat or Millet					
Vitamins (Fruits or vegetable)					
Minerals (Pumpkins or carrots)					

Any other information you want to share?

……

……

……

APPENDIX II: INTERVIEW SCHEDULE FOR INSTITUTIONS

I am a student of The University of Kabianga taking a Master of Science in Agricultural Extension. I am carrying out a research on the Elements Prompting the Contribution of Urban and Peri- urban Agriculture on Household Food Security in Kericho County; Kenya: The research work is a prerequisite for the award of Master of Science in Agricultural Extension. I kindly request you to fill this questionnaire for me.

Kindly answer all the questions honestly and do not indicate your name anywhere in this questionnaire. Your response was used purely for academic purpose and was treated with utmost confidentiality.

Sincerely

Richard Rotich

Reg. No: AGR/PGEX/002/10

Signature _____

Questionnaire No……. Date……..

Institution…… Sub county……

1. What is your role and mandate in relation to urban agriculture's contribution to household Food security?

.....

.....

.....

2. In your view, how has access to agricultural extension services influenced the contribution of urban and peri urban agriculture to the households' food security in Kericho County?

.....

.....

.....

.....

3. In your view, how has farmer characteristics influenced the contribution of urban and peri urban agriculture to households' food security Kericho County?

.....

.....

4. in your view, how production characteristics influenced the contribution of urban and peri urban agriculture to the households' food security in Kericho County?

……

……

5. In your view, how has farmer access to market has influenced the contribution of urban and peri urban agriculture to the households' food security in Kericho County?

.....

.....

6. What problems have constrained development of Urban and Peri-urban Agriculturein Kericho County?

……

……

……

7. What are the main challenging issues associated with urban agriculture?

……

……

……

……

8. What will you recommend as the way forward for Urban and Peri-urban Agriculture in Kericho County?

……

……

……

Thank you for your corporation

APPENDIX III: RESEARCH AUTHORIZATION

UNIVERSITY OF KABIANGA
ISO 9001:2008 CERTIFIED
OFFICE OF THE DIRECTOR, BOARD OF GRADUATE STUDIES

20TH SEPTEMBER, 2018

Ref: AGR/PGEX/002/10
Richard K. Rotich,
Department of Horticulture
University of Kabianga,
P.O Box 2030- 20200,
KERICHO.

Dear Mr. Rotich,

RE: CORRECTED PROPOSAL

This is to acknowledge receipt of two copies of your corrected Proposal entitled **"Factors Influencing the Contribution of Urban and Peri-Urban Agriculture to Household Food Security in Kericho County, Kenya."**

You are now free to commence your field work on condition that you obtain a research permit from NACOSTI.

Please note that, you are expected to publish at least one paper in a peer reviewed journal before final examination (oral defence) of your Masters thesis.

Thank you.

Yours Sincerely,

20 SEP 2018

Prof. J. K. Kibett
DIRECTOR, BOARD OF GRADUATE STUDIES.

c.c 1. Dean, SAB
2. HOD, Horticulture
3. Supervisors

APPENDIX IV: LETTER OF RESEARCH AUTHORIZATION FROM

NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone:+254-20-2213471, 2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/18/91578/25780**

Date: **3rd November, 2018**

Richard Kipkoech Rotich
University of Kabianga
P.O.Box 2030 - 20200
KERICHO.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Factors influencing the contribution of Urban and Peri- Urban Agriculture to household food security in Kericho County, Kenya"*** I am pleased to inform you that you have been authorized to undertake research in **Kericho County** for the period ending **30th October, 2019.**

You are advised to report to **the County Commissioner and the County Director of Education, Kericho County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Kericho County.

The County Director of Education
Kericho County.

THIS IS TO CERTIFY THAT:
MR. RICHARD KIPKOECH ROTICH
of UNIVERSITY OF KABIANGA, 112-20200 KERICHO,has been permitted to conduct research in *Kericho County*

on the topic: ***FACTORS INFLUENCING THE CONTRIBUTION OF URBAN AND PERI- URBAN AGRICULTURE TO HOUSEHOLD FOOD SECURITY IN KERICHO COUNTY, KENYA***

for the period ending:
30th October,2019

Permit No : NACOSTI/P/18/91578/25780
Date Of Issue : 3rd November,2018
Fee Recieved :Ksh 1000

.....
Applicant's Signature

.....
Director General
National Commission for Science, Technology & Innovation

APPENDIX V: LETTER OF RESEARCH AUTHORIZATION FROM COUNTY GOVERNMENT OF KERICHO

MINISTRY OF EDUCATION

STATE DEPARTMENT OF EARLY LEARNING AND BASIC EDUCATION

Email:cdekerichocounty@gmail.com
When Replying Please Quote:

County Education Office
P.O BOX 149
KERICHO

REF: KER/C/ED/GC/2/VOL.II/

18TH JULY, 2019.

TO WHOM IT MAY CONCERN.

RE: RESEARCH AUTHORIZATION.
RICHARD KIPKOECH ROTICH.

The above student has been authorized by the National Commission for Science, Technology and innovation to undertake research on "***Factors influencing the contribution of urban and peri-Urban agriculture to household food security in Kericho County before 30th October, 2019.***

Kindly accord him the necessary assistance.

COUNTY DIRECTOR OF EDUCATION
P.O. BOX 149 KERICHO
18 JUL 2019

ZACHARY MUTUIRI
COUNTY DIRECTOR OF EDUCATION
KERICHO COUNTY.

OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND CO-ORDINATION OF NATIONAL GOVERNMENT

Telegrams: .....
Telephone: Kericho 20132
When replying please quote
kerichocc@yahoo.com

THE COUNTY COMMISSIONER
KERICHO COUNTY
P.O. BOX 19
KERICHO

REF: MISC.19 VOL.III/244

18th July,2019

Richard Kipkoech Rotich
University of Kabianga
P.O Box 2030-20200
KERICHO

RE: RESEARCH AUTHORISATION

I am pleased to inform you that you are authorized to undertake research as per the letter Ref. No. NACOSTI/P/18/91578/25780 dated 3rd November, 2018 on ***"Factors influencing the contribution of Urban and Peri-Urban Agriculture to household food security in Kericho County, Kenya"*** for a period ending 30th October, 2019.

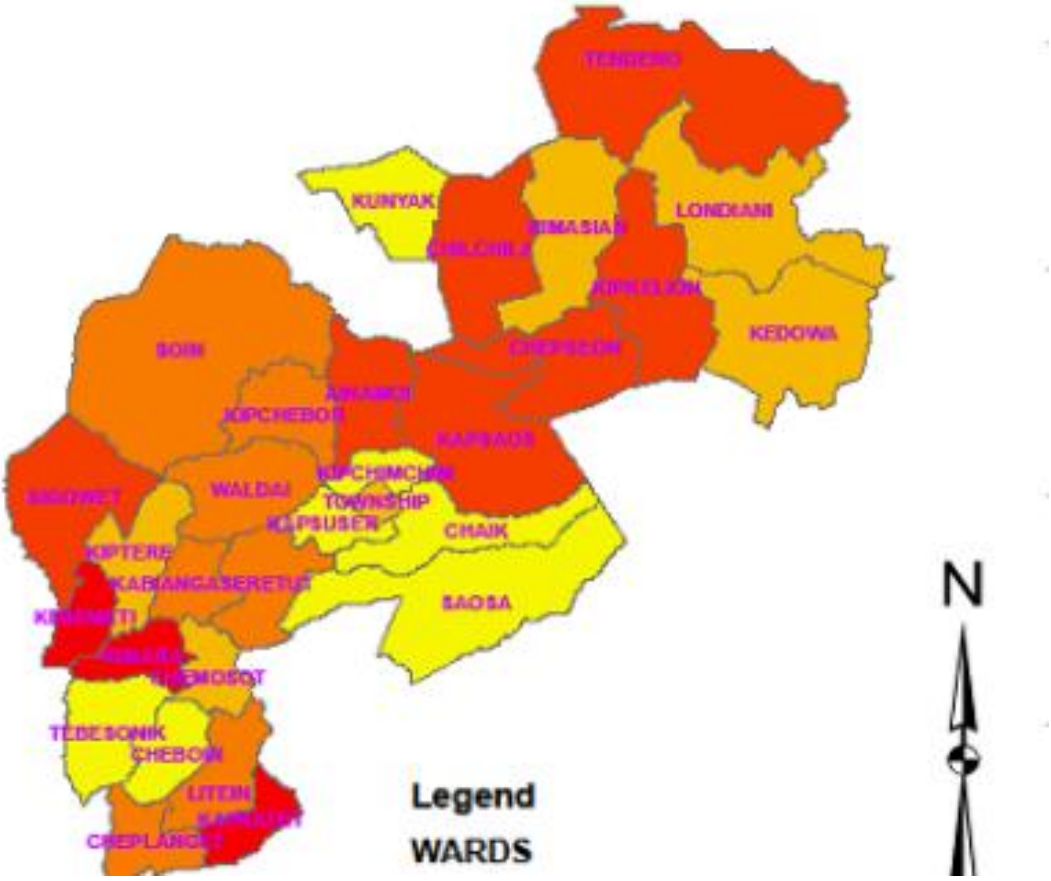
Any assistance accorded to him is highly appreciated.

COUNTY COMMISSIONER
KERICHO COUNTY

Ezekiel Amonde
FOR: COUNTY COMMISSIONER
KERICHO COUNTY

CC: County Director of Education
KERICHO

APPENDIX V: A MAP OF KERICHO SHOWING MAJOR TOWNS



APPENDIX VI: JOURNAL PUBLICATION

IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 14, Issue 10 Ser. II (October 2021), PP 41-48
www.iosrjournals.org

Factors influencing farmers' access to the market on food produced on urban and peri-urbanareas of Kericho County, Kenya

1. Richard KipkoechRotich, *Department of Horticulture, University of Kabianga,*
2. JoashKibett, *PhD, Department of Horticulture, University of Kabianga*
3. George MbiraKere, *PhD, Department of Agricultural Biosystems and Economics, university of Kabianga*

Abstract
Many households are consistently turning to Urban and Peri-urban food production for consumption and commercial purposes. However, there is limited research, if any, that has been conducted to explore the influence of farmers' access to the market on the food produced in this areas. A descriptive research design was used in this study that examined factors influencing farmers access to the market on the food produced on urban and peri-urban areas of Kericho County of kenya. The targeted population was a total of 3487 Urban and peri-urban agriculturalists in Kericho County. A sample of 341 Urban and peri-urban agriculturalists was sampled using stratified random sampling and simple random sampling methods. Data was collected using a structured and unstructured feedback form. Data werethen analysed using frequencies and proportion while hypotheses were confirmed using Chi-square at 0.05 alpha level. Descriptive and inferential statistics were calculated using SPSS Software Version 21.0. The study concluded that access to market directly correlate with household food security in Kericho County.The study also recommends that farmers should be educated on the need to access the markets directly within their locations. It further recommends that the county government of Kerichoshould establish a good market network for farmers by identifying markets for local production. Finally, comparative research studies should be conducted among different counties in Kenya to find out on how urban and peri-urban farmers are accessing market for their produce. This is because the present study concentrated only on towns within Kericho County.

Keywords: *Households, Farmers, market access, Urban and peri-urban, Kericho County*

Date of Submission: 05-11-2021 Date of Acceptance: 20-11-2021

I. Introduction

Agriculture is among the essential sectors, and it is the foundation of the Kenyan economy, adding up to around 25% of the Gross Domestic Product (GDP). Agriculture also employs approximately 75% of the national work compel and is one of the big four agendas under the Kenya's administration (The Republic of Kenya, 2017). More than 80% of the Kenyan populations who live in the country zones earn a living, specifically or by implication from agriculture. The growthof the agricultural sector is an important aspect in terms of in poverty alleviation. The economic and demographic growth of cities globally, viarelocation and industrial development, results in spatial expansion, leading to encroachments by cities upon adjacent urban and peri-urban (UPA) areas (Telintelo, 2001). Several households are increasingly shifting towards Urban and Peri-urban Agricultural food production for their consumption and commercial purposes. The primary reason people engage in Urban and Peri-urban Agriculture is to respond to unreliable, inadequate, and irregular access to food supplies as indicated by the Food and Agriculture Organization (2012). Around 870 million individuals are believed to have been malnourished in 2010– 2012. This figure translates to 12.5% of the worldwide.By far, most of these, 852 million resides in developing countries (Bon 2010).

Farming in Kenyan towns is exponentially gaining significance as revealed by the agricultural activities on immediate environs of these towns and in the heart of the Kenyan towns (Corrigan, 2011). Agricultural activities have been witnessedalongside roads, railways, waterways, amidst roundabouts, and in parks, just to name a few. Farm animals such as goats, cows and sheep graze around in towns and open spots. Generally, if UPA is implemented effectively, it enhances farming efficiency, leading to enhanced food availability (Romani 2003, Evenson and Mwabu 2001).

Recent studies have revealed that 64% of people leaving in urban areas in Kenya practice urban agricultural farming (Hide &Kimani, 2015). Therefore, urban agriculture is a strategic tool adopted in a bid to

address household food insecurity, challenges of unemployment, and encouraging productive participation in local and urban development.

Urban and Peri-urban Agriculture (UPA) may be practised on farmstead (on-plot) or private land (owned, leased) land away from the dwelling places (off-plot), or on public land including parks, safeguarding areas, alongside roads, watercourses, and railways. As a result of urbanization, land for farming has decreased, raising concern for some households' food security and source of income. According to Food and Agriculture Organization, (FAO, 2012), families are believed to be secure when all family members have enough food to sustain themselves for the whole year and even have supplies that they can sell to get some source of income for sustenance.

Urban and Peri-urban Agriculture

Urbanization in Africa,has been more fast and riotous than in Europe with insufficiencies in direction and infrastructural improvement (Johnson, Suarez and Lundy, 2006). The quick urban development is regularly in conjunction with insufficient administration frameworks, infrastructural advancement, land organization, absence of mechanical and financial development has prompted what is regularly called the African urban emergency (Chiesura, 2004). Caleb et al. (2010) noted that urban and peri-urban zones have a fairly improved, for instance in areas surrounding streets, power and telephone lines.

There is rivalry amongst agricultural production and residential housing in Urban and peri-urban land utilizers, with the housing part having a higher monetary return. Urban and peri-urban farming is seen as basically transitory or transient land employments. In this way, there is a need to take a gander at UPA regarding Urban and Regional Planning (Hide and Kimani, 2015). Since Kenya is now occupied with the improvement of a far-reaching Land Policy, there is a chance to incorporate UPA as form of land utilization and enhancing source of income.

Farmers participating in Urban and Peri-urban Agriculture faces myriad of challenges including uncertainty of land tenure, size which are normally small pieces of land, marketing of the produce, theft, less productive soils, animal and crop diseases, among others.

Kericho County in Kenya isnormally characterized by heavy rainfall, high altitude and fertile soil hence highly productive for agricultural activities. The County receives rainfall almost throughout the year with the main agricultural activities being Maize production, pineapples, horticultural crops, tea, and coffee, among others. Animal production is also widely practised in most parts of the county with dairy farming dominating. Friesians and Ayrshires are the common breeds for dairy in the area. Despite the county being endowed with these agricultural productivities, little research has been done to ascertain UAP agriculture's contribution in enhancing household income through the sale or market of the farm produce from this area.

Agricultural extension service gives imperative data, for example, designs in edit costs, new seed assortments, trim administration, and advertising. Familiarity with existing advancements produces successful request by giving a basic flag to enter appropriation frameworks (Davidson et al.,2001). Along these lines, expansion frameworks and information dissemination frameworks commonly strengthen the commitment of augmentation to agrarian profitability development, relying upon working information circulation frameworks and the other way around. Also, perfect expansion framework gives criticism from agriculturists to inquire about focuses.

Agricultural extension has undergone restructuring to counter the ever-varying circumstance of progression ahead. Ranchers in inaccessible zones are being urged to develop sustenance trims initially to guarantee nourishment security. Extension needs are being created in three noteworthy agro-environmental zones to help advances extraordinary possibilities for cultivating wages and family unit nourishment while keeping up the asset base's manageability. Owens et al. (2003) scrutinized the consequence of rural augmentation benefit on cultivating generation in Zimbabwe found that in the wake of controlling for natural efficiency qualities and rancher capacity either utilizing family unit settled impacts approximation or by incorporating a degree of agriculturist capacity and the town settled impacts, access to rural expansion administrations, characterized as accepting one to two visits for every year, increases the estimation of yield creation by around 15%.

An assortment of extension strategies should be utilized. Choice and utilization of suitable strategies keeping in mind the end goal to meet particular augmentation targets with different classifications of ranchers were important. They incorporate (a) singular homestead and home visits for development, (b) assemble strategies: shows to agriculturists' gatherings, field visits, (c) media usage to make mindfulness and achieve vast population at once, (d) training of farmers and (g) stakeholder's participation.

Market linkages enable the facilitation of agricultural products' flow between the different categories of marketing levels. According to Reardon *et al.* (2003), productive showcasing foundation, such as discount, retail, and getting together markets and storerooms, is basic for practical advertising, limiting present gather misfortunes and diminishing well-being dangers. Markets assume a noteworthy part in salary age, food security,

rustic improvement, creating provincial market linkages and sexual orientation issues. Organizers and approach creators need an inside and out comprehension of how to think of market systems that meet the network's social and monetary needs. Likewise, they ought to know how to pick a reasonable site for another market

Statement of the Problem

Although there is increasing responsiveness regarding the function of urban agriculture in the sector of food security and poverty eradication for the urban population, agriculture in the cities exists largely as an informal area that has not been incorporated to agricultural strategies or urban scheduling, which makes it exposed to danger while jeopardizing its continuity. Several studies have suggested that urban agriculture will continue to increasingly play an important role in livelihood activity in developing countries by contributing significantly to the household livelihood systems and the urban informal economy. Most of the government's effort to expand agriculture has been directed to rural areas, whereas urban and peri-urban farming which has significantly contributed to food security and household income has been neglected. There is also limited research, if any, that has been conducted to explore the impact of Urban and Peri-urban Agriculture and its effects on the household source of revenueand income. Therefore this study investigatedthe factors influencing farmers' access to the market on food produced on urban and peri-urban areas ofKericho County, Kenya.

II. Materials And Methods

The study was undertaken in four major towns within the four sub-counties of Kericho, namely Kericho, Kipkelion, Londiani and Litein, with the estimated population of 9000. Kericho County is one of the 47 counties in Kenya. Farming is the county's dominant activity with tea forming the largest agricultural activity. Land tenure in the county isindividually owned andsmall scale farming is practised. There were two target populations for this study. The first populations were 3487 UPA farmers in Kericho County of different age, gender, educational level, according to the Ministry of Agriculture and Fisheries, Economic reviews (2015). The second populations were 30 extension agricultural county staff agents who were involved in UPA activities. Therefore, the researcher targeted 3487 Urban and peri-urban agriculturalists and 30 extension agents.

The study was based on a descriptive research design. This design was chosen because it helps answer the questions; what, why, when, where and how? And thus provide in-depth insights into the matter being investigated. Therefore, this research design was used to make inferences about the factors influencing UPA farmers' access to market in Kericho County through studying a representative sample of the population.

The study used interview plans and questionnaires to gather data. Kothari (2014) noted that the use of questionnaires had been widely utilized as a part of a scope of business and other related research because of its fair-minded nature and capacity to reach and get a response from many respondents. The interview schedule was utilized to gather data from the Ministry of Agriculture staff. The interview schedule waspreferred because they were easy to interpret and complement the questionnaire, making them clear and understandable. The study was conducted between March and June 2019.

III. Results And Discussion

From the total of 341 questionnaires which were administered, 298 questionnaires were returned, representing a response rate of 76.5%.

Table 1: Response Rate of respondents

Response	Frequency	Percentage
Expected responses	341	100
Received responses	298	76
Un-received	43	14

Source; Researcher 2019

The questionnaires were administered, then the respondents were given time to complete them and thereafter they were collected. The reason for this was that the method used to allocate questionnaires was a drop-and-pick technique where the scholar distributed the questionnaires and waited for the respondents to complete it and thereafter took back the filled questionnaires. According to Kothari (2014), it is assumed that feedback rating at 50% is considered as average, 60-70% is satisfactory while above 70% is an outstanding rate of response. This response rate was regarded as an excellent illustration of the respondents to give information for examination and generation of effective conclusions. The sample size was illustrative of the initial sample to a high degree, ensuring the validity of the findings. The outcomes of the findings are presented in Table 1.

Furthermore, 30 officials from the department of agriculture were reached for the interview, whereby they gave more insights on questions contained in the questionnaires.

Distribution of respondents by gender

In order to determine the gender of farmers engaged in urban and peri-urban farming, the respondents were requested to specify their sex and the responses captured as shown in figure 1.

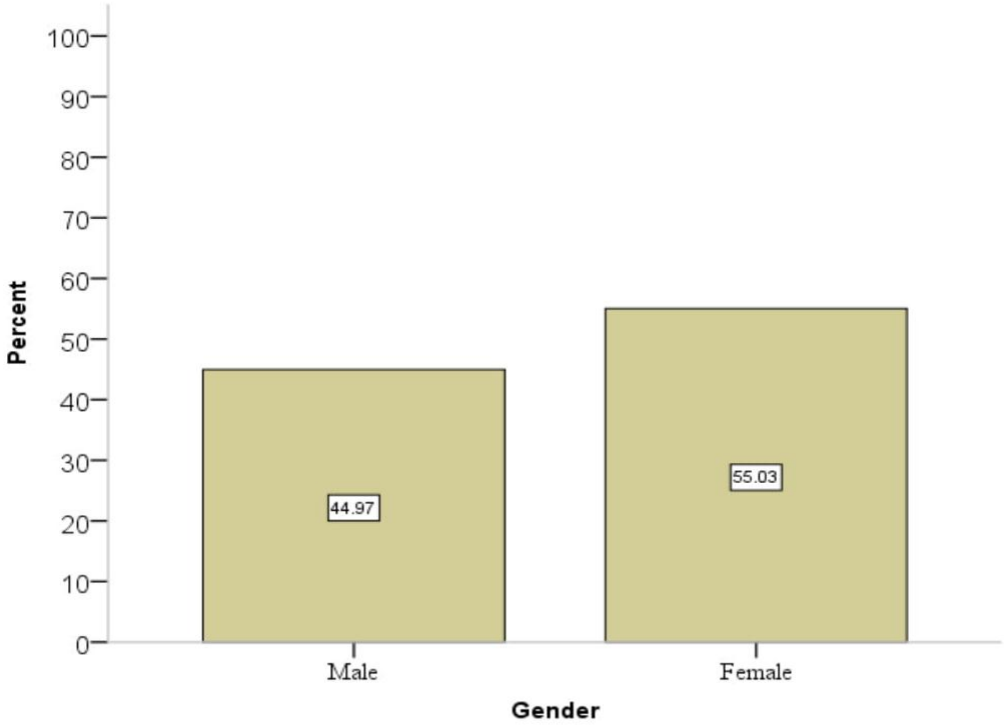


Figure 1: Respondents gender per percentage

The findings reveal that many of respondents practising urban and peri-urban farming were females as shown by the number of percentage of 55.03% of the female as compared to 44.97% of male. However, the margin between the two categories is not that large, and this shows that both genders are actively involved in urban and peri-urban farming. The findings disagree with the findings of Mwangi (2017) who found out that majority of those who are practicing UAP farming were masculine.

Distribution of respondents by age

The researcher wanted to know the age of the respondents. The findings are shown in Table 2

Table 2: Distribution of respondents by age

	Frequency	Percentage
Below 25 years	27	9.1
26-35 years	69	23.2
36-45 years	106	35.6
46-55 years	72	24.2
Over 55 years	24	8.1
Total	**298**	**100.0**

The results show that majority of the respondents were aged 36-45 years, (35.6% while the least were over 55 years (8.1%). This suggests that most farmers were aged 36 years and above, implying that younger farmers are more willing to engage in urban agriculture than older ones. It may also infer that urban agriculture is a recent phenomenon.

Distribution of respondent's by farm produce

The researcher wanted to know the nature of urban and peri-urban farming practised by agriculturalists in Kericho County, and the outcomes were as shown in Figure 2.

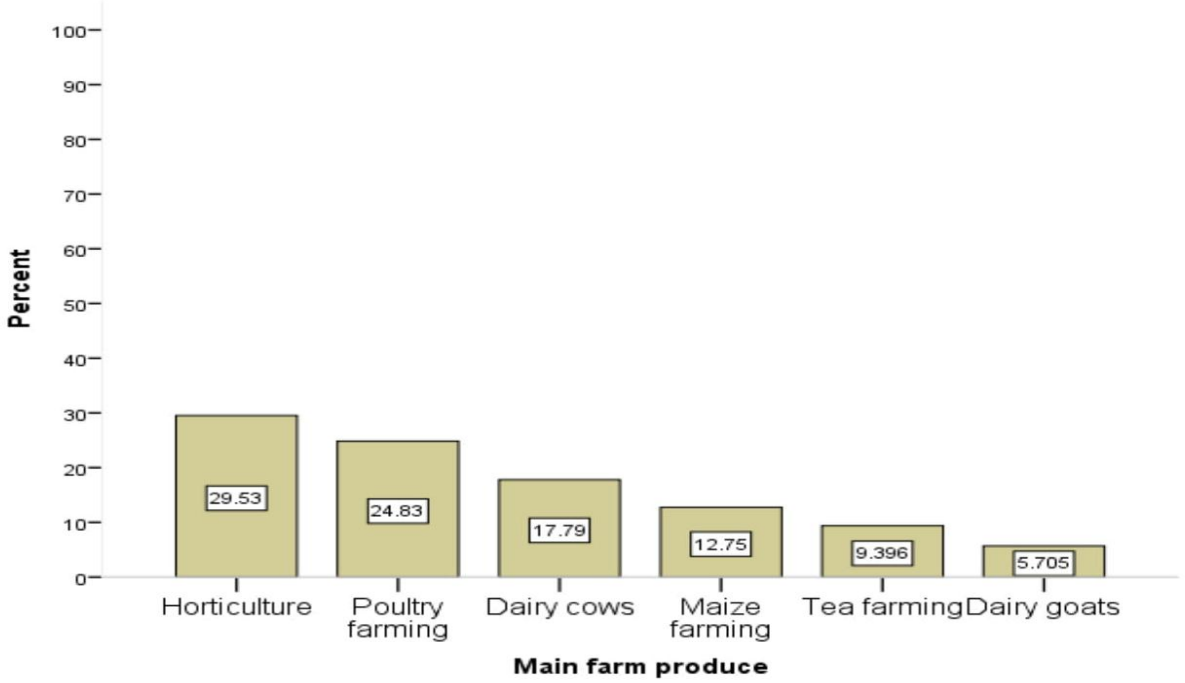


Figure 2: Distribution of types of farming in UPA per percentage

The results reveal that 29.53% of the respondents practice horticultural farming, 24.83% poultry farming, and 17.79% kept dairy cows, 12.75% maize farming, 9.396 tea farming and 5.705% dairy goats. This means that majority of the farmers in Kericho County mainly practice horticulture and poultry farming in urban and peri-urban such as Kericho town, Londiani, Kipkelion and Litein. The finding agrees with that of Ravertz (2000) who found that farmers in urban areas mostly produced horticulture and poultry products. He further found out that urban nourishments can be diverse and of more nutrition benefits than the rural ones for individuals who have ways of accessing various food.

Distribution of respondent's by experience

As indicated in Table3, 37.6% of respondents had an experience of 6-9 years, 22.8% had 2-5 years, 22.5% had 10-12 years, 10.7% had over 12 years and 6.4 had less than one year of experience.

Table 3:Respondent's by experience in UPA by frequency

	Frequency	Percentage
Less than 1 year	19	6.4
2-5 years	68	22.8
6-9 years	112	37.6
10-12 years	67	22.5
Over 12 years	32	10.7
Total	**298**	**100.0**

This is a signal that a substantial number of the respondents had undertaken Urban and Peri-urban Agriculture for a significant period of time, and consequently, they were in a spot to provide dependable information relevant to this study. This indicates that many of the participants had enough knowledge of Urban and peri-urban farming.

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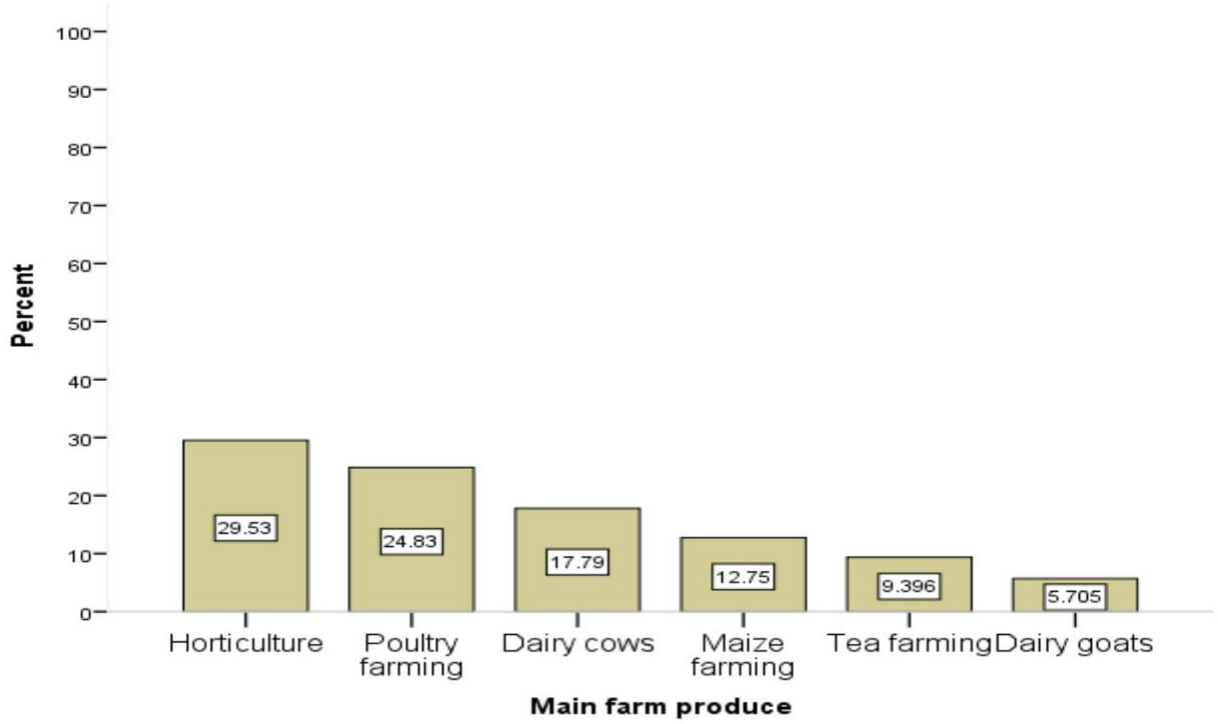

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Distribution of respondent's by education

The participants were requested to specify their peak educational level; the results are shown in Table 4.

Table 4: Respondents education level

	Frequency	Percentage
Illiterate	17	5.7
Kenya Certificate of Primary Education	20	6.7
Kenya Certificate of Secondary Education	123	41.3
Diploma	60	20.1
Degree	60	20.1
Masters	18	6.0
Total	**298**	**100.0**

Source; Researcher 2019

From the study results, 41.3% of the respondents had attained Kenya Certificate of Secondary Education (KCSE) level, 20.1 had a college diploma and degree credentials, while 6.7% of the participants showed they had achieved Kenya Certificate of Primary Education (KCPE) level, and 6% of the participants showed they had reached masters level of education. This suggests that many of the participants were well-educated, and consequently, they were in a position to answer the study question with comfort. The findings differ with that Kenya of Economic Survey (2013), which reported that those who practised Urban and Peri-urban Agriculture had fairly low education achievement as compared to middle-income people. Nearly 65% of the population had only primary or half-finished secondary education, whereas 10% has never been to school.

Access to market

Access to the market place allows the distribution of agricultural products, and it is one of the important components of food chain management. The participants were requested to give their responses to various market access indicators. The outcomes were as indicated in Table 5.

Table 5: Market outlets for farm produce by percentage

	Frequency	Percentage
Supermarket	23	7.7
Open Market Centers	104	34.9
Neighbourhood	53	17.8
Middlemen	56	18.8
Markets outside the county	62	20.8
Total	**298**	**100.0**

The results show that 34.9% of respondents produced and sell the produce in the open market, 20.8% sells the produce outside the county, 18.8% sells their produce to the middlemen, 17.8% sells their produce to the neighbourhood, and 7.7% sells their produce to the supermarkets. This implies that most farmers produced for local consumption while the rest were sold to various market outlets. Local consumption is significant as it helps alleviate food insecurity. On the other hand, the export of produce ensures more income to the farmer given competitive prices offered at the international market. Furthermore, the country is able to earn a substantial foreign currency due to the export business. The findings are in line with that of Kinuthia (2008) who found out that urban farming has the possibility to flourish in most recent municipalities of the world, because of its diverse roles and links with city issues. Cities offer easy access to the market place and the dominant high demand for food.

The hypothesis corresponding to this study stated that *"There is no statistically significant influence of access to the market on the contribution of Urban and Peri-urban Agriculture on household food security in Kericho County."* The results for the chi-square test are presented in Table 6.

Table 6: Chi-square results of access to market and household food security

Variable	N	Chi-square value x^2	Significant level (P-0.05)
Access to market	298	639.701	0.000

As shown in Table 6, the chi-square test shows P=0.000<0.05. Since this value is less than 0.05, the study fails hence it rejects the null hypothesis that statesthat "there is no statistically significant influence of access to the market on the contribution of Urban and Peri-urban Agriculture on household food security in

Kericho County" and accept the alternative hypothesis which is that "there is a statistically significant influence of access to the market on the contribution of Urban and Peri-urban Agriculture on household food security in Kericho County.

IV. Conclusion, Recommendation And Further Studies

Most farmers (82.7%) had no specific buyer for their produce, with (71%) of them targeting the local market. Most farmers (69.9%) sold their produce to direct consumers. Of significance, no farmer was found to be selling their produce to cooperatives. Furthermore, most farmers (80%) preferred to dispose of their produce through market sellers and grain millers. On availability of storage facilities, very few farmers (29%) had this important resource, the general store and home store being the most adopted one. Again, most farmers (75%) lacked the means to preserve their produce. The packaging was the only value addition practice employed by some farmers (7.1%). However, the majority (92.1%) did not bother to add value to their produce. Most farmers (88%) stated that they experienced very few difficulties during the marketing of their produce. The nature of market difficulty found to be affectingmost of the farmers was poor road network as recorded by 96% of them. On pricing, most farmers (80%) were not involved in setting prices of their produce. Furthermore, availability or seasonality of the produce was recorded as the most influential price determinant as captured by 50.6% of farmers. Other important price determinants included brokers and prevailing market prices. Lastly, it was concluded that access to the market by most of the farmers was still a challenge despite them being close to the market places. The study found that majority of the farmers was selling their produce to individuals for re-sale.

The study recommends that farmers should be educated on the need to access the markets directly within their locations. This is to ensure that their produce fetches the maximum prices and ensure good distribution and exchange of various agricultural products within the available markets.

The study also recommends that farmers should be educated on the need to access the markets directly within their locations. It further recommends that the county government of Kericho should establish a good market network for farmers by identifying markets for local production.

Finally, comparative research studies should be conducted among different counties in Kenya to find out on how urban and peri-urban farmers are accessing market for their produce. This is because the present study concentrated only on towns within Kericho County.

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