

**YOUTH PARTICIPATION IN VEGETABLE PRODUCTION TOWARDS
IMPROVEMENT OF LIVELIHOODS IN KAKAMEGA TOWN, KENYA**

BY

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Degree of Master of Arts in Geography, Department of Geography, School of
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DECLARATION

Declaration by Student

This thesis is my original work and has not been presented for a degree in any other university. No part of this thesis may be reproduced without the prior written permission of the author and/or Moi University.

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SASS/PGG/05/2012

Declaration by the supervisors

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

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Moi University, Eldoret, Kenya

DEDICATION

I dedicate this thesis to my dear wife Judith, Son Ethan, father Daniel and mother Melisa.

ABSTRACT

Urban vegetable production is critical in supplementing food, saving on food expense, income generation and improving the livelihood of farmers. However, minimal research has been done to establish whether youth participation in vegetable production could improve livelihoods. This study focused on the extent of youth participation in vegetable production towards improvement of livelihoods in Kakamega Town, Kenya. It specifically aimed to: establish the contribution of youth to vegetable production, assess the farming resources accessible to youth, establish the benefit of vegetable production to livelihoods, and identify the major constraints to vegetable production and livelihoods. This study employed the Theory of Planned Behaviour, Sustainable Livelihood Approach and a conceptual model to understand the problem. A survey research design was adopted whereby 159 households were randomly selected and data was collected by use of structured questionnaires, interview schedules, and photography. It was established that youth mainly engaged in land preparation, planting, weeding, pest and disease control and harvesting of vegetables mainly in the afternoon on weekdays. It was revealed that more than 90% of the youth would continue engaging in vegetable production in future. Youth engaged in other livelihood activities due to the higher and quick returns, interests, academic qualifications and job satisfaction obtained. Vegetable plots were mainly obtained through negotiation with the county government officials. Most youth were accessible to water for irrigation. Personal savings were the main source of finance while the farm inputs were mainly bought. Parents were the main alternative source of labour and the extension services were mostly sought from agricultural shows. Parents and older siblings influenced the youth to start engaging in vegetable production. Youth participation in vegetable production enhanced food supply, saving on food expenses, income generation and involvement in social activities. The main vegetable production constraints included: chicken destruction of vegetable; insect pests and diseases; vegetable theft; inadequate land and insufficient finance. Some of the vegetable production constraints were managed by: fencing of vegetable gardens; applying insecticides; reporting theft cases to the administration and hiring of more land. In conclusion, youth participation in vegetable production promoted food supply, reduction on food expenditure, income generation and participation in social activities. It is recommended that access to farming resources should be enhanced and production constraints minimized to promote youth participation in vegetable production. Urban planners and scholars should focus on youth participation in vegetable production on community lands in Kakamega or other urban centres towards improvement of livelihoods.

TABLE OF CONTENTS

DECLARATION.....	ii
DEDICATION.....	iii
ABSTRACT.....	iv
TABLE OF CONTENT.....	v
LIST OF TABLES.....	x
LIST OF FIGURES.....	xi
LIST OF PLATES.....	xii
ABBREVIATIONS.....	xiii
OPERATIONAL DEFINITIONS.....	xiv
ACKNOWLEDGEMENT.....	xvi
CHAPTER ONE.....	1
INTRODUCTION.....	1
1.0 Introduction.....	1
1.1 Background to the study problem.....	1
1.2 Statement of the Problem.....	4
1.3 Objectives of the study.....	5
1.3.1 Main objective.....	5
1.3.2 Specific objectives.....	6
1.4 Research questions of the study.....	6
1.5 Justification of the study.....	6
1.6 Significance of the study.....	7
1.7 Scope and limitations of the study.....	8
1.8 The study area.....	10
CHAPTER TWO.....	14

LITERATURE REVIEW, THEORETICAL AND CONCEPTUAL FRAMEWORK	14
2.1 Introduction.....	14
2.2 Youth in urban areas of developing nations.....	14
2.3 Contribution of youth to urban agriculture.....	16
2.4 Access to farming resources.....	18
2.5 Benefit of vegetable production to livelihoods.....	21
2.6 Constraints to vegetable production.....	24
2.7 Existing Policies, Institutions and Processes on youth participation.....	25
2.8 Present study and knowledge gaps.....	27
2.9 Theoretical Framework.....	30
2.9.1 Theory of Planned Behaviour.....	30
2.9.2 Sustainable Livelihood Approach.....	33
2.10 Conceptual Framework and Model.....	41
CHAPTER THREE.....	43
RESEARCH METHODOLOGY.....	43
3.1 Introduction.....	43
3.2 Research design.....	43
3.3 Target population.....	43
3.4 Accessible population.....	43
3.5 Sample size.....	44
3.6 Sampling techniques and procedures.....	45
3.7 Data collection instruments and procedure.....	46
3.8 Research procedure.....	46
3.9 Data analysis techniques and procedure.....	47
3.10 Quality data control.....	48

3.11 Ethical concerns of this study.....	49
CHAPTER FOUR.....	50
RESULTS AND DISCUSSIONS.....	50
4.1 Introduction.....	50
4.2 Respondents' characteristics.....	50
4.3 Contribution of youth to vegetable production.....	53
4.3.1 Level of participation in vegetable production.....	54
4.3.2 Length of time spent on the farm per week.....	55
4.3.3 When youth engage in vegetable production.....	57
4.3.4 Length of time youth have participated in vegetable production.....	58
4.3.5 Trend on the sizes of land under vegetable production.....	59
4.3.6 Future youth participation in vegetable production.....	59
4.3.7 Types of vegetables grown by youth.....	61
4.3.8 Reasons for youth participation in vegetable production.....	62
4.3.9 Reasons on why some youth do not engage in vegetable production.....	63
4.3.10 Reasons for participation in other economic activities.....	64
4.4 Access to resources for vegetable production.....	65
4.4.1 Access to land.....	66
4.4.2 Access to water.....	69
4.4.3 Access to farm inputs.....	72
4.4.4 Access to finances.....	73
4.4.5 Access to labour.....	74
4.4.6 Access to extension services.....	75
4.4.7 Decision making to use farming resources.....	78
4.5 Benefit of vegetable production to livelihood.....	79

4.5.1 Benefit on food supply.....	80
4.5.2 Benefit on food expenses.....	82
4.5.3 Benefit on income generation.....	83
4.5.4 Uses of income from vegetable sales.....	84
4.5.5 Benefit on social activities.....	85
4.5.6 Benefit on the environment.....	86
4.6 Constraints to vegetable production.....	87
4.6.1 Chicken destruction of vegetables.....	89
4.6.2 Insect pests and diseases.....	91
4.6.3 Vegetable theft.....	92
4.6.4 Inadequate land.....	93
4.6.5 Inadequate finances.....	94
4.6.6 Inadequate extension services.....	94
4.6.7 Extreme weather conditions.....	94
4.6.8 Constraints towards improvement of livelihood.....	95
4.6.9 County government policies.....	97
CHAPTER FIVE.....	98
SUMMARY, CONCLUSION AND RECOMMENDATIONS.....	98
5.1 Introduction.....	98
5.2 Summary of the findings.....	98
5.2.1 Contribution of youth to vegetable production.....	98
5.2.3 Access to farming resources.....	99
5.2.4 Benefit of vegetable production on livelihood.....	100
5.2.5 Constraints to vegetable production and livelihoods.....	101
5.3 Conclusion.....	102

5.4 Recommendations.....	103
5.4.1 Recommendations on policy.....	103
5.4.2 Recommendations for further research.....	106
REFERENCE.....	107
APPENDIX 1: QUESTIONNAIRE FOR YOUTH VEGETABLE FARMERS.....	115
APPENDIX 2: INTERVIEW SCHEDULE FOR SELECTED FARMERS.....	122
APPENDIX 3: INTERVIEW SCHEDULE FOR ESTATE ELDER / AGRICULTURAL OFFICER.....	124
Y	

LIST OF TABL

Table 2.1: Summary of literature review and identified gaps.....	28
Table 3.1: Distribution of the farmers in the three settlement areas.....	44
Table 4.1: Respondents' characteristics of respondents.....	51
Table 4.2: Youth participation index indicating level of youth's participation.....	54
Table 4.3: Correlation analysis showing the factors influencing length of time spent on vegetable farm.....	56
Table 4.4: Time of the day when youth engage in vegetable production.....	57
Table 4.5: Trend of vegetable production.....	59
Table 4.6: Types of vegetables produced.....	61
Table 4.7: Reasons why some youth not participating in vegetable production.....	63
Table 4.8: Reasons for participation in other livelihood activities.....	64
Table 4.9: How vegetable plots were acquired.....	66
Table 4.10: Influence of access to land on youth participation.....	69
Table 4.11: Sources of water for irrigation.....	70
Table 4.12: How access to water influences vegetable production.....	72
Table 4.13: Main source of farm inputs.....	72
Table 4.14: Source of labour for vegetable farming.....	74
Table 4.15: Individuals and stakeholders supporting youth participation.....	78
Table 4.16: Where respondents obtained vegetables during off peak season.....	81
Table 4.17: Amount of money spent on green vegetables per meal during off-peak season (November and February).....	82
Table 4.18: Uses of the money obtained from vegetable sales.....	84

Y

LIST OF FIGURES

Figure 1.1: Map of Kakamega Town.....	12
Figure 1.2: Map of the Study area.....	13
Figure 2.1: A Conceptual model of cause-effect relationship between youth participation in vegetable production and livelihoods.....	42
Figure 4.1: Length of time spent on the farm per week.....	55
Figure 4.2: Length of youth participation in vegetable production.....	58
Figure 4.3: Reasons for vegetable cultivation.....	62
Figure 4.4: Sources of financial resources (credit).....	73
Figure 4.5: Where extension services were sought.....	76
Figure 4.6: Reasons why youth do not seek extension.....	77
Figure 4.7: Adequacy of vegetables for food.....	80
Figure 4.8: Income obtained from vegetable sales.....	83
Figure 4.9: Major constraints experienced by respondents.....	88

LIST OF PLATES

Plate 1: Type of vegetables grown.....	62
Plate 2: Use of mosquito net to prevent chicken from invading the vegetable farm...90	

ABBREVIATIONS

CPWF	Challenges Programmes on Water and Food
DfID	Department for International Development
FANRPAN	Food Agriculture and Natural Resources Policy Analysis Network
FAO	Food and Agriculture Organization
GoK	Government of Kenya
IFAD	International Fund for Agricultural Development
IWMI	International Water Management Institute
KAPP	Kenya Agricultural Productivity Programme
KARI	Kenya Agricultural Research Institute
MoA	Ministry of Agriculture
ODM	Orange Democratic Movement
RUAF	Resources Centres on Urban Agriculture and Food Security
SDG	Sustainable Development Goal
SLA	Sustainable Livelihood Approach
SPSS	Statistical Package for Social Sciences
TPB	Theory of Planned Behaviour
UA	Urban Agriculture
UDF	United Democratic Forum
UNDP	United Nations Development Programme
UN-Habitat	United Nations Human Settlement Programme

OPERATIONAL DEFINITIONS

Assets/resources: In this study resources/assets, include land, capital, farm inputs, farming skills, water and social connections. The terms are used interchangeably in this study.

Food security: In this study it refers to the presence of food, ability of youth to access food and fair distribution of the food to every individual at the household level in sufficient quality and quantity as a result of vegetable production.

Informal Sector: In the present study this implies the economic sector that is easy to venture into without formal rules such as vegetable production.

Institutions: Prain & Lee-Smith (2010) notes that the institutions include markets, local government, education organizations, policies and regulations concerning use of land and water resources. In this study it implies the provincial administrators, KARI officers, agricultural extension officers and County Government laws within Kakamega Town.

Participation: In the present study participation implies the engagement of youth in procurement of farm inputs, land preparation, planting, weeding, insect pests and disease control, harvesting and selling of vegetables.

Sustainable livelihood: a livelihood is sustainable if it can cope with and recover from stress and shock, maintain or enhance its capabilities and assets (Chambers & Conway, 1991). In this study sustainable livelihood implies the ability of the households to evade hunger and poverty and consequences of these challenges by engaging in urban vegetable production.

Town: According to Urban Areas and Cities Act of 2011 Part II, Section 10, subsection 2 (a) of Kenya is an area of having a minimum of ten thousand residents as per the final gazette results of the latest population census. In this study a town refers to a concentration of more than 10,000 people like Kakamega has over 90,000.

Urban Agriculture: In the present study it implies the production of food crops as well as rearing of livestock for production of food within the boundaries of urban areas.

Urban Area: a city or town with its surrounding fringes with a population of about 10000 to 50000 dwellers. In this study an urban area implies a city, a town, or municipality.

Urban vegetable cultivation /production/farming: is the process of engaging in tilling the land, planting, weeding, controlling pests and diseases, use manure/fertilizer, harvesting and selling of vegetables within Kakamega Town.

Urbanization: In this study it implies the process by which people were increasing in urban areas.

Youth participation: it implies involvement or engagement of youth in urban vegetable production within the urban areas such as Kakamega Town.

Youth/young people/young men and women: According to the Kenyan Constitution (Government of Kenya, 2010) a youth is a person residing in Kenya falling in the age bracket of 18 to 35 years. In this study these terms youth are used interchangeably with young to mean individuals residing in urban areas aged between 18 and 35 years.

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CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter includes the background of the study problem, statement of the problem, objectives, research questions, justification, significance, scope and limitations, the study area and layout of the thesis.

1.1 Background to the study problem

Globally, the number of youth living in urban areas has increased greatly in recent time owing to the effects of rural - urban migration and natural population increase. However, this large proportion of youth is absorbed in the informal sector due to limited opportunities in the formal industry. Unfortunately, due to limited capacity of the informal sector to promote better living standards most of the youth in developing countries are susceptible to poverty. UN-Habitat (2010 a) reported that there has been an increase in the number of the young poor working persons in the sub-Saharan Africa as compared to other regions. It has been argued that if these young individuals are not empowered then they are likely to engage in crime-related activities (UN-Habitat, 2010a). Urban farming has emerged as a coping strategy for most of the poor urban dwellers (Mbiba, 2000; Rogerson, 1998).

Urban vegetable production is highly profitable because it requires minimal land space, little water for irrigation and the market for vegetables is readily available. This is facilitated by rapid urbanization, fast technological transfer in urban areas and presence of many unemployed youth that could offer labour in urban areas (Adedeji & Ademiluyi, 2009; Drescher, 2002). For farming to be sustainable it requires

physical strength, innovativeness and agility (Brooks *et al.*, 2013). It has been noted that youth have the time, power, abilities and the capacity to innovate and take risks, although many young people have been underutilized [Donye *et al.*, (2012); D'Silva *et al.*, (2012); International Fund for Agricultural Development (IFAD) (2012)]. Furthermore, most youth opt to engage in agricultural activities that have high and quick returns so that they could secure an income throughout the year (Njenga *et al.*, 2013).

The unemployed and energetic youth are perceived as the future farmers and future drivers of Africa's social and economic development. According to D'Silva *et al.* (2012) although youth can contribute greatly to the sustainability of agriculture, since they could provide labour and technical knowhow, this sector is still dominated by elderly farmers. There is a great need to incorporate youth in the development projects and programmes in urban centres in sub-Saharan Africa [Food Agriculture and Natural Resources Policy Analysis Network (FANRPAN), 2012].

Urbanization in developing countries like Kenya has been on upturn. The rise of urban population in Kakamega Town has been due to a high fertility rate of 5.7% per annum (Wegulo, 2013) leading to urban poverty rate of more than 50% (Dose, 2007). This has negatively influenced the food security and income levels of the urban residents. Wegulo (2013) reveals that the impacts of food insecurity are manifested in the rise of mortality rate of children below five years, skin complications and intestinal worms. Furthermore, since most foodstuffs consumed in urban areas are bought, urban food security relies on the economic status of the urban households (Garrett, 2000). UN-Habitat (2013) observed that about forty five per cent

(515million) of the youth around the world depend on less than two US dollars per day and therefore they are likely to be affected by urban food insecurity.

Kimaro *et al.* (2015) noted that youth participation in agriculture in Rural Tanzania was able to get food, obtain income, get educational services and secure social network from farming activities. According to Wegulo (2013) urban commercial farmers in Kakamega Town have increased their ability to access food from farming although the subsistent farmers' ability was low and this was attributed to limited factors of production. It has been argued that the achievement of Kenya's Vision 2030 is based on the youth participation in the social, economic and political dimensions now and in the future; since the young persons were the main stakeholders and the beneficiaries of the Vision 2030 [Government of Kenya (GoK, 2007)]. Furthermore, youth participation in urban agriculture (UA) is critical in the achievement of Sustainable Development Goal (SDG) number one (1) which deals eradication of extreme poverty and SDG number two that entails to end hunger (UNDP, 2016).

However, most of the youth in developing countries like Kenya have limited access to the farming resources (Auta *et al.*, 2010; Filmer & Fox, 2014). Some of the young people have a negative perception towards farming which hinders them from effective participation in agriculture [Government of Kenya & Kenya Agricultural Productivity Programme [(GoK & KAPP), 2011]. With regard to land acquisition, Njeru & Gichimu (2014) noted that most youth in Kenya farm on the family land yet in most times they get nothing or very little money from this work. They further explained that in areas where land is communally owned, decisions on utilization of this land were commonly done by the elderly, often neglecting the interests of the youth. Also,

Njeru & Gichimu (2014) reveals that credit providing institutions normally perceive young people as unreliable clients compared to the older farmers.

Bello *et al.* (2011) indicate that youth engaging in rice production in Nigeria experienced insufficient capital, inadequate farm inputs, insufficient farmland, inadequate storage facilities and insufficient to information. It has been noted that for agricultural sector to create jobs for large number of young people, the constraints must be minimized (Filmer & Fox, 2014). According to Wegulo (2013) there are various stakeholder and institutions that offered financial support and management of sponsored projects, innovation from research, market value and chain development that influenced the performance of UA in Kakamega. Moreover, the Kenya Agricultural Research Institute (KARI) has introduced new farming technologies and the Non-Governmental Organizations (NGO's) have funded one-acre projects, "*Piga Njaa Marufuku*" (Kiswahili word for eradication of hunger) as well as offered financial support among others to promote UA within Kakamega town (Wegulo, 2013). Filmer & Fox (2014) observed that in Kenya among other countries the agricultural extension services have been devolved such as in Kakamega Town the extension offices have been decentralized within the town.

1.2 Statement of the Problem

A large proportion of workers in the urban informal sector are youth and they experience a myriad of problems that include coping up with high food prices and they receive low wages. This has been attributed to the limited opportunities that informal industry contributes towards improvement of their livelihoods. Urban vegetable production has emerged as one of the activities that could complement other livelihood strategies that the youth engage in. Wegulo (2013) revealed that urban

farming within Kakamega Town leads to sustainability of livelihood. Simiyu (2012) reported that future participation of youth in urban farming would promote its sustainability and promote achievement of sustainable livelihoods.

However, the contribution of youth to vegetable production in Kakamega Town has not been clearly established in terms of level, length of time spent on the farm, trend of farm size, when youth participate, length of participation in Kakamega and future participation (Wegulo, 2013). Furthermore, essential farming resources such as land, water, finances, farm inputs and labour necessary for youth participating in urban vegetable production have not been well reported. The contribution of youth participation in vegetable production to livelihoods has received little recognition in Kakamega Town. The constraints facing youth participating in urban vegetable production have received limited attention in Kakamega Town.

Based on the above, some questions among others are left unanswered like: Do the youth participating in vegetable production intend to continue with the activity in future? If yes, do these youth engaging in vegetable production contribute to the livelihoods of households in Kakamega Town? Thus, the current study attempted to fill this void by establishing the extent of youth participation in vegetable production towards improvement of livelihoods in Kakamega Town, Kenya.

1.3 Objectives of the study

1.3.1 Main objective

The main objective of this study was to assess the extent of youth participation in vegetable production towards improvement of livelihoods in Kakamega Town.

1.3.2 Specific objectives

The following specific objectives guided this study:

1. To establish the contribution of the youth to vegetable production in Kakamega Town, Kenya.
2. To assess the farming resources accessible to youth vegetable farmers in Kakamega Town, Kenya.
3. To establish the benefit of vegetable production on improvement of livelihoods in Kakamega Town, Kenya.
4. To identify the major constraints to vegetable production and livelihoods in the Kakamega town, Kenya.

1.4 Research questions of the study

1. What is the contribution of the youth to vegetable production in Kakamega Town, Kenya?
2. What farming resources are accessible to young vegetable farmers in Kakamega Town, Kenya?
3. What is the benefit of vegetable production to improvement of livelihoods in Kakamega Town, Kenya?
4. What are the major constraints to vegetable production and livelihoods in Kakamega Town, Kenya?

1.5 Justification of the study

Kakamega is a town located in a densely populated county of Kakamega which is the second most populated county in Kenya after Nairobi. Kakamega Town is experiencing a rapid rate of urbanization, experience high urban poverty level (52%) and informal sector is the dominant economic activity. About 62 per cent of all

households in Kakamega County obtain their livelihood from agriculture. Urban vegetable farming is an agricultural activity in the town. Therefore, the area was relevant in establishing the extent of youth participation in vegetable production towards improvement of livelihoods. The choice of Amalemba, Matende and Mundiri estates was based on the following reasons: (a) there was vegetable production within the study area; (b) there was participation of youthful population in urban farming within Kakamega Town (c) there were several different communities within the study areas and hence the findings could be replicated in other middle-sized cities in Kenya and Africa and (d) the study area is accessible from the Central Business District of Kakamega Town and KARI which was critical for access to: market, knowledge and extension services.

1.6 Significance of the study

Many studies have been conducted on urban farming in major and secondary cities in Kenya such as Nairobi, Nakuru, Eldoret, Kisumu and Kakamega (Foeken & Mwangi, 2000; Foeken & Owuor, 2000; Memon & Lee-Smith, 1993; Mireri, 2013; Simiyu, 2012; Wegulo, 2013). However, these studies have paid little attention to the contribution of youth to urban farming. This study intended to narrow this gap by establishing the contribution of youth to vegetable production.

Recent studies have revealed that access to farming resources and presence of production constraints influenced urban farming (Simiyu, 2012; Wegulo, 2013). Yet, minimal studies have been carried out to investigate how the access to resources and production risks influences youth participation in vegetable production. The present study contributed to the debate by establishing the influence of youth access to farming assets and production risks on youth participation with intentions of

establishing how youth promote access to resources and minimize the challenges they encounter.

This study is relevant to urban land use planners especially on use of urban land for vegetable production within Kakamega Town. The current study would be important in livelihood studies, because the study contributes to debate of youth participation in vegetable production in Kakamega Town towards improvement of livelihoods.

1.7 Scope and limitations of the study

Overall, the current study covered the extent of youth participation in vegetable production towards improvement of livelihoods in Kakamega Town, Kenya. Firstly, it specifically established the contribution of youth to vegetable production by examining the following items; level of youth participation, length time spent on the farm, time when youth participate, length of participation, trends in size of the farms, future participation, types of vegetables grown, reasons for participation in vegetable farming and other livelihood activities. Secondly, this study covers the level of access to farming resources such as land, water, finances, farm inputs, labour, extension services and decision on utilization of the resources was investigated.

Thirdly, the benefit of vegetable production to food supply, saving on food expenses, income generation and social activities were established. Also, the challenges to vegetable production like vegetable destruction by chicken, insect pests and diseases attack, vegetable theft, inadequate land, insufficient finance, insufficient extension services, extreme weather conditions (heavy rains and little rainfall) and constraints to livelihoods such as environmental risks, economic hardships and political violence was also examined in this study. The possible solutions to constraints to vegetable production such as promoting access to more land, reducing conflict between

livestock keepers and vegetable farmers, reducing insect pests and diseases attacking vegetables, curbing vegetable theft and reducing challenges of poor weather conditions were also covered.

There were several limitations to this study. Firstly, the study did not cover the entire area owing to unequal distribution of urban farming households within Kakamega Town. Secondly, due to absence of an update sampling frame for urban vegetable farmers the researcher carried out census to determine the exact number of vegetable farming households. Since the study targeted youth aged between 18 and 35 years, it was important to establish the age first beforehand. Thirdly, in some of the households there was more than one youth participating in urban vegetable production, in such cases the researcher had to inquire more about who participated more frequently.

Some of the youth out rightly stated that they were not willing to participate in the study because they were busy on academics or business. Other respondents noted that they were filling a similar questionnaire, which was not true. The respondents were informed that the research was academic in nature and its findings would inform the agricultural stakeholders in the provision of extension services and other incentives that would benefit the respondents. Also, most of the respondents were found mainly in the mornings and afternoons because they were engaged in other economic activities during the day. Therefore, the respondents were administered with the questionnaires and interviewed in the afternoon.

1.8 The study area

Kakamega Town lies on Latitude $0^{\circ} 17^1$ N and Longitude $34^{\circ} 45^1$ E and is found in Western Kenya lying about 30km north of the Equator. It is located about 400 Kilometres west of the country's capital city of Nairobi, 52 km north of Kisumu and is

about 30 km away from Mumias town. It lies between 1200 Metres and 1700 Metres above sea level and the town occupies an estimated area of 49.9 square kilometres. Kakamega is located on Lake Victoria Basin, which was formed during the middle Pleistocene by earth movements (Ingenieure, 2011). The main rock type of the region is granite, constituting of the intrusive Kavirondian and Nyanzian system rocks. There is fertile clay-loam soil developed out of the predominant granitic rock systems and these soils belong to the latosols more specifically to the ferrisols (Ingenieure, 2011).

The town and its surrounding areas experience tropical climate characterized by the mean annual rainfall of about 2000mm and two rainy seasons - the long rains between March to June and short rains between July and September [GoK, 2001]. High temperatures were experienced throughout the year with slight variations in mean maximum and minimum ranges of 28^o c to 32^oc and 11^oc to 13^oc respectively and the mean annual evaporation ranges from 1,600mm to 2,100mm with high (GoK, 2001). Kakamega forest is found in the area as a remnant equatorial rain forest that stretches west into Uganda and it is a habitat for a several monkey species, slightly more than 300 bird species and about 400 butterfly species (Ingenieure, 2011).

Kakamega town is located in a densely populated county of Kakamega. According to Dose (2007) former Kakamega District (part of Kakamega County) had an annual population growth rate of 2.12%. Most of the rural-urban migrants to Kakamega Town originated from the County. Kakamega Town is experiencing a rapid urbanization and urban poverty level of 52% (Dose, 2007); and the informal sector was dominant among the residents. According to Ingenieure (2011) about sixty two per cent of the households in Kakamega County obtain their livelihood from agriculture which are facilitated by the climate that is suitable for crops such as maize, sugarcane, bananas and horticultural crops (GoK, 2001). The farms are privately

owned or trust land administered by the local authorities and government land leased to tenants (Ingenieure, 2011).

Kakamega Town has two main wards (Sheywe Ward located in the Eastern part of the Town and Bukhungu Ward situated in the south western parts of the Town). Sheywe Ward has two Sub-Locations namely; Sichilayi (27 estates) and Township similar to Bukhungu Ward that has Shirere (20 estates) and Mahiakalo Sub-locations. Sichilayi has a population density of 2500 persons/km²while Shirere has a population density of 1923 persons / km².

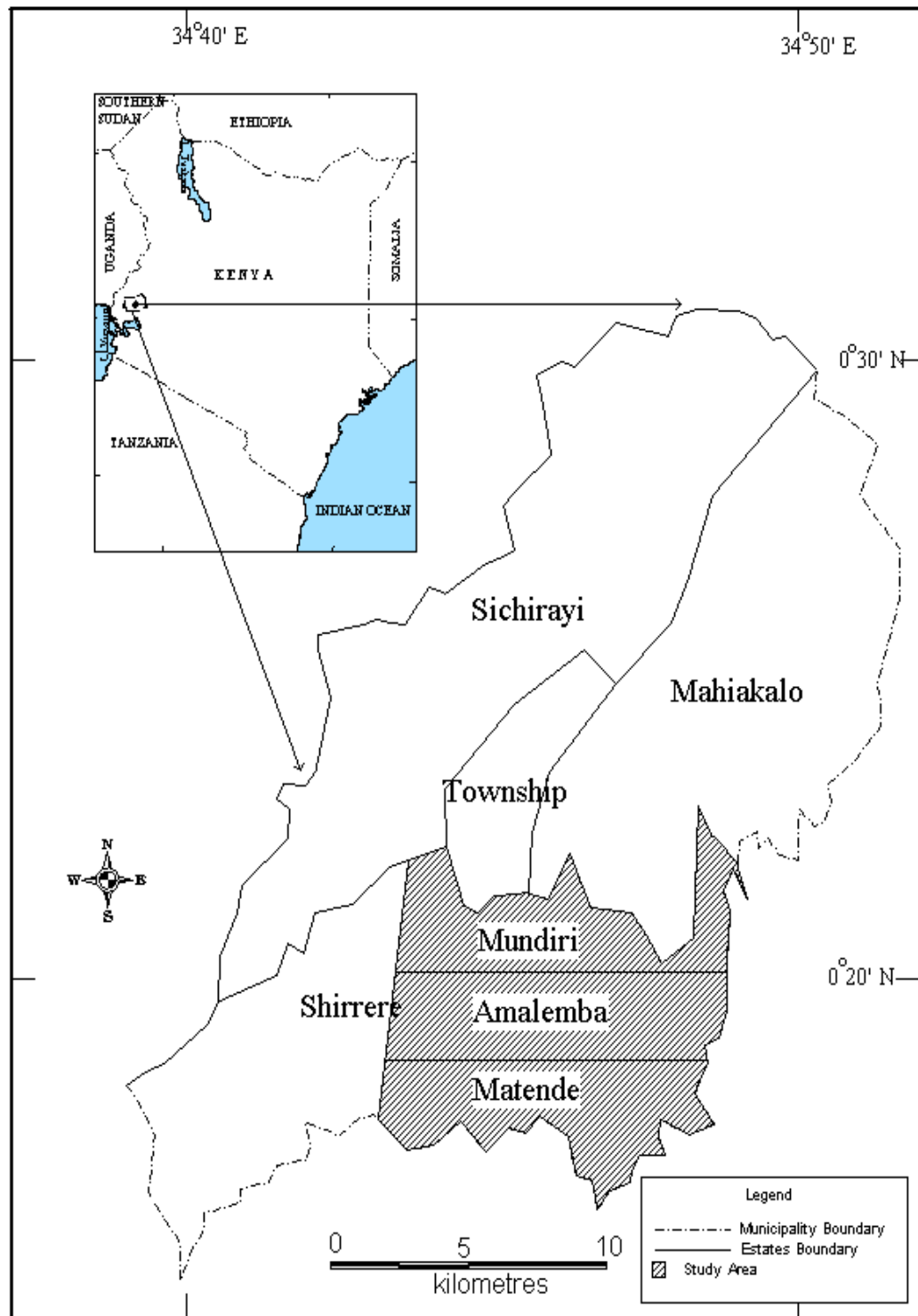


Figure 1.1: Map of Kakamega Town. Source: Author (2017)

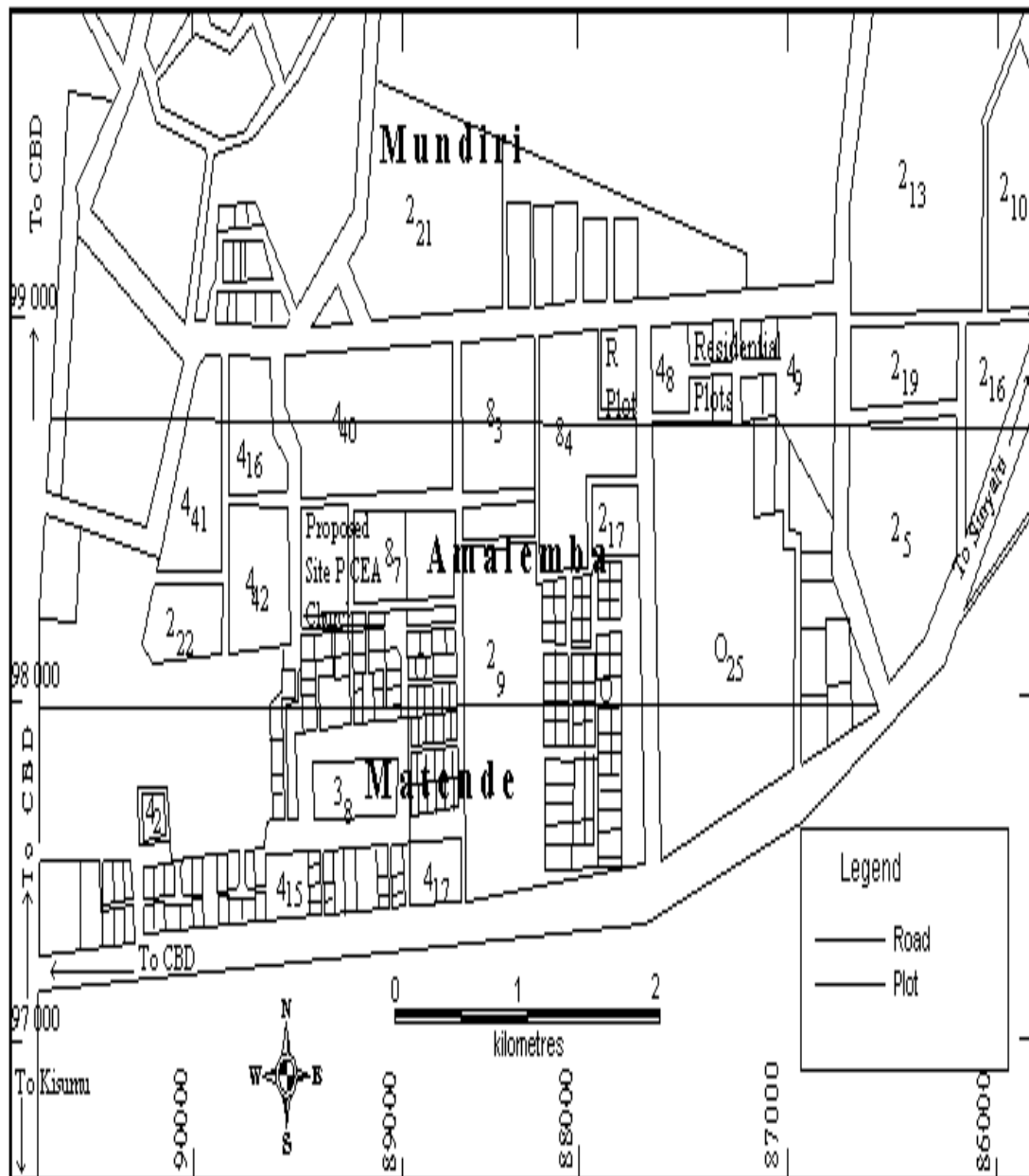


Figure 1.2: Map of the Study area. Source: (Author, 2017)

CHAPTER TWO

LITERATURE REVIEW, THEORETICAL AND CONCEPTUAL FRAMEWORK

2.1 Introduction

This chapter presents the existing information on: youth in urban areas of developing nations; youth participation in urban agriculture in sub-Saharan Africa and developing countries; access to farming resource for urban farming; challenges facing the youth participating in UA; and the existing policies, institutions and programmes in Kenya that influence youth participation and empowerment; present study and knowledge gaps; theoretical and conceptual framework.

2.2 Youth in urban areas of developing nations

Developing nations compared to the rich nations, experience rapid urbanization which is due to natural population growth and rural-urban migration. In these nations, rural youth have a high probability of migrating to urban areas compared to adults. Some youth migrate to seek better job opportunities, experience better urban life and social amenities and to seek educational services (pull factors) while others migrate due to lack of interest in farming and rural poverty (push factors) (Pam, 2014; Smit, 1998).

Memon & Lee-smith (1993) argue that medium and small sized urban areas are experiencing a large number of immigrants from rural areas. Regionally, the population of the young people in Africa was estimated to be sixty percent of the urban population by 2010 (Sommers, 2010). In Kenya, the young population has been approximated to be twenty three percent of the total urban population by 2013 (GoK, 2013).

However, the concerns raised by many youth-based studies is not the high number of young people streaming into the urban centres of developing countries each day, but the inadequate social amenities and unemployment in these cities (GoK, 2013). Moreover, the formal industry in the developing countries is unable to create more job opportunities to the youth seeking jobs (Sommers, 2010; UN-Habitat, 2010b). According to GoK (2013) the problem of unemployment and underemployment in Kenya has been aggravated by the 2007/2008 post-poll violence, rise in world food prices, increased world oil prices and stagnation government efforts to promote youth employment. Therefore, many of these urban youth migrants are either absorbed in the family-owned enterprises, small and low productivity industries; domestic work or the informal sector (Thieme, 2010; UN-Habitat, 2010b).

The expansion of informal sector and its importance has received recognition in literature since this sector is dominated by many youngsters in developing countries (Hope, 2012). Information available for youth participation in Kenyan labour market indicates that in 2006 about 25 % of youth was employed leaving the 75% to bear the burden of unemployment (GoK, 2007). Furthermore, the female youth in Kenya constituted the highest proportion of the unemployed compared to their male counterparts by about 10 % (UNDP, 2013).

FANRPAN (2012) noted that the young people are marginalized in terms of job opportunities and encounter a myriad of challenges that hinder their capacity to influence the existing policy processes. In addition, Floro & Swain (2010) reveals that individuals that have low paying jobs like those in the informal sector experienced food shortage and unreliable wages and were vulnerable to accidents and theft. Furthermore, most poor urban dwellers are likely to reside in the informal settlements

that are associated with overcrowding, poor drainage and inadequate sanitation facilities (Atieno, 2013). The youth in Kakamega Town engaged in informal activities such as: small scale trading, transport services by bicycle (motor bicycle) and urban farming to secure their livelihoods (Atieno, 2013).

2.3 Contribution of youth to urban agriculture

Generally, agriculture is the main source of livelihood to most developing countries including Africa. While assessing youth participation in urban agriculture, Brooks *et al.* (2013) observed that about 40% of urban youth in Africa were involved in agriculture. In Ghana, Obuobie *et al.* (2006) reported that individuals falling in the youth bracket (20 and 30years) in Kumasi, Accra and Tamale engaged in urban vegetable production. Regionally, urban farmers aged between 21 and 40 years were 20.1% in Morogoro and 16.1% in Mbeya towns in Tanzania (Mlozi, 2004) while in Uganda Ahaibwe *et al* (2013) noted that 13% of urban youth in Uganda were involved in farming.

Foeken & Owuor (2000) noted that 64.3% of urban food producers were aged between 20 and 39 years in Nakuru. Simiyu in his study based in Eldoret Municipality, indicated that 36% of the urban farmers were aged between 20 and 39 years (Simiyu, 2012). Wegulo (2013) noted that more than three-fifths (64.4%) of the farmers in Kakamega Town constituted of a youthful population.

The contribution of the youth to agriculture is critical because they are energetic, innovative and dynamic. Bello *et al.* (2011) observed that most Nigerian youth producing rice were involved in land clearing, farm tilling, planting and harvesting while a few engaged in weeding /herbicide spraying and marketing of rice. The youth involved in Local Makurdi (Nigeria) in agriculture through provision of labour,

buying farming inputs, providing finances, attending farming related meetings, and seeking extension services (Daudu *et al.*, 2009).

According to Kimaro *et al.* (2015) youth engaged in agriculture through working on family farms, on their farms or through selling the labour force or a combination of the three in Moshi rural district in Tanzania. Ngome & Foeken (2010) indicate that most of the farmers in Buea in Cameroon were employed and therefore they normally worked on their farms early in the morning while others worked in the evening. It has been documented that the level of youth involvement in agriculture depended on the gender, family background, occupation, income and education (Kimaro *et al.*, 2015). In their study done in Nakuru Municipality, Foeken & Owuor (2000) observed that the main reason why households engaged in UA was for food production. Simiyu (2012) indicated that one of the motives for urban crop farmers in Eldoret town was to enhance food security and nutrition within the households.

However, some youth currently involved in farming but are not planning to continue with it in future. This could be attributed to the negative attitudes, knowledge and beliefs of the youth. Aphunu & Atoma (2010) tend to agree with this argument by reporting that youth in Nigeria believed that agriculture is meant for school drop-outs, agriculture promotes poverty, agriculture is a bad enterprise, it is for the underprivileged in the society, farming is for the elderly and that agriculture reaps little returns. It has been noted that youth in Kenya generally perceive farming as an activity meant for the elderly, farmers as unskilled, uneducated and physical labourers who earn very little for agricultural production in comparison to formal and other informal sectors (GoK & KAPP, 2011).

Some studies indicate that youth prefer to engage in non-farming livelihood activities. Chagwiza *et al.* (2012) revealed that in Harare, youth participated in other economic activities such as selling of electronic goods since they regarded farming as time consuming and tiresome. This could explain why the number of youth farmers is likely to reduce in future. As indicated by Ahaibwe *et al.*, (2013) that the number of youth participating in UA in Uganda was on the downturn.

2.4 Access to farming resources

Access to farming resources is the most significant requirement for any farmer to venture into farming with no exception of the youth. For youth to participate effectively in vegetable production they require: adequate land; sufficient water for irrigation; enough financial resources and farm inputs, reliable source of cheap labour and extension services (Simiyu, 2012). Kimaro *et al.* (2015) reported that the youth in Kahe West ward in Rural Tanzania were motivated towards agriculture by: availability of land; access to credit facilities; their agricultural skills and knowledge. Wegulo (2013) while studying UA in Kakamega Town established that access to: land, water, credit and socio-technical support influenced positively to the sustainability of UA.

Urban land is a vital asset not only commercial and residential building but also for urban farming. According to Obuobie *et al.* (2003) urban farmers obtained land for urban farming in Accra (Ghana) through direct negotiation between the potential farmer and landlord. In the peri-urban regions, urban farmers secured land through land inheritance and paying the landowners through sharing of the proceeds (Obuobie *et al.*, 2006). Ahaibwe *et al.*, (2013) revealed that most of the land owned by farmers in Africa is under customary tenure system and about seven in every ten of the youth headed households use land under this tenure system. However, this tenure system

rarely provides security of tenure for land owners but limits development since it fails to promote advancement of land markets (Ahaibwe *et al.*, 2013). They added that land conflicts arise from the ownership and right of access to some of the local authority lands (Obuobie *et al.*, 2003).

Water is critical for irrigation of vegetables during the dry season. Obuobie *et al.*, (2003) reported that household urban vegetable farmers in Accra (Ghana) obtained water for vegetable irrigation from piped water or recycled water from bathrooms and kitchen while peri-urban producers depended on rainfall and streams or rivers. According to Obuobie *et al* (2006), irrigation is mainly done early in the morning or in the evening when the rate of evaporation is low. The water is carried by use of water buckets from the source to the farm (Obuobie *et al.*, 2003).

Finances are required for purchase of farm inputs, paying farm workers, hiring of land and acquiring of materials used for making mobile gardens. Hope (2012) noted that more financial resources should be provided to the potential young entrepreneurs (Hope, 2012). Ahaibwe *et al.*, (2013) noted that access presence of credit promotes the chances to invest and enhance access to productive inputs and important resources for promotion of farm production.

Urban farmers require seeds, seedlings, fertilizer and agro-chemicals to ensure there is year round production of vegetable. Burleigh & Black (2001) revealed that urban farmers in Manila (Philippines) obtained farming inputs such as seeds and fertilizers through formal and informal borrowing. Ngome & Foeken (2010) revealed that most of the vegetable farmers bought improved seeds from local traders while a few did not buy but relied on friend or relatives for seeds. Urban farmers in Manila used agro-chemicals to manage pests and diseases (Burleigh &Black, 2001).

Farmers source for labour from their parents, siblings, spouses, their children, friends, neighbours and casual labourers. For instance, Adewale *et al.*, (2005) supports this by noting that all the farm children engaged in planting, weeding, application of fertilizers and spraying of agro-chemicals. However, many of these children were intending to pursue careers in law, engineering and medicine while a few had interest in farming as an occupation (Adewale *et al.*, 2005).

Hope (2012) emphasizes that the provision of appropriate knowledge and skills is important for the youth involved in economic development now and in the future. Agricultural information about new farming technology, problems and practices is important to urban farmers. According to Ahaibwe *et al.*,(2013) extension services include provision of information about improved seeds, the required fertilizers and insecticides, land use practices and market information. However, studies indicate that youth in a few households (8.9%) in Uganda were accessible to extension services (Ahaibwe *et al.*, 2013).

The decision to start farming and use the available farming resources is due to internal or external motivations. Internal motivations involve interests, perception and willingness to participate in agriculture. Man (2012) observed that some of the youth farmers were afraid to attempt and risk as well as fear of the perception of others and social inclusion. The external motivations may include parents, older siblings, neighbours, friends, mass media or extension officers. But, Adenkule *et al.*, (2009) revealed that the parental consent was insignificant on the engagement in farming.

2.5 Benefit of vegetable production to livelihoods

Urban farming is important to the individual farmers as well as their household members. Most of the poor and middle income earners urban farmers are motivated to

engage in farming mainly to increase food supply and to earn income to their households and while the rich engage in farming to increase supply to fresh food, to use available land space, for cultural reasons and to make the environment green as discussed below.

It has been documented that some households in the towns of Lilongwe and Blantyre in Malawi produce food that could support them entirely throughout the year (Mkwambisi *et al.*, 2010). Maxwell *et al.*, (1998) noted that UA contributed to better quality and adequate quantity of food as well as reduction in malnutrition among children in Kampala (Uganda). Foeken & Mwangi (2000) noted that farming in Nairobi was significant in promoting food security by providing energy and proteins as well as reduced food expenses. However, Frayne *et al.* (2009) cautioned that, food security and sustainable development could only be achieved through urban farming if the urban low-income dwellers were involved directly in urban and peri-urban food production.

According to Nugent (2000) the urban poor produced food within cities for not only nutrition but also income generation. For instance, in West African cities of Dakar, Tamale, Accra, Kumasi, and Buea urban dwellers grew vegetables mainly for sale and therefore the vegetable producers earned money (Mbaye & Moustier, 2000; Obuobie *et al.*, 2006; Ngome & Foeken, 2010). Ngome & Foeken (2010) revealed that urban vegetable farmers in Buea (Cameroon) used the income obtained to cater for educational expense of their children and medical services. Locally, urban farmers in Nairobi and Eldoret earned a significant amount of money that was used in meeting some of the basic needs (Foeken & Mwangi, 2000; Simiyu, 2012). According to Auta *et al.*, (2010) youth farmers used the proceeds from agriculture and other livelihood

activities to buy land, radio, television, video players and means of transport like a vehicle.

Generally, farming can play a vital part in creating employment for the youth as well as reducing on criminal activities and other social problems (Suriname, 2009). Urban farming has the potential to create employment for the jobless city dweller. Foeken & Mwangi (2000) indicated that majority of those producing and selling valuable crops were employed by the farm owners but the income earned by the youth varied depending on the scale of production, the demand of the product in the market and the place where it was sold.

Sotamenou & Parrot (2013) revealed that vegetable farming in urban areas will be sustainable because urban horticulture is part of culture. Auta *et al.*, (2010) revealed that youth farmers in Nigeria were members of farmers' groups, Community Development Associations, Traders' Associations and Sport clubs. According to Suriname (2009) the ability to secure income in farming can provide an avenue for minimizing and attracting youth whose alternative livelihood activities are socially unacceptable.

Environmental sustainability can be enhanced through urban farming. Urban farming involves the use of small plots of land, use of organic farming methods that manage water resources, reduce wasteful plastic packages and use of transport fossil-powered, reduction in greenhouse emissions, beautification of the neighbourhoods and improve soil nutrients (Bradshaw, 2013; Lemma & Rao, 2013).

According to Memon and Lee-smith (1993) UA is part of the urban informal sector, although some scholars rarely perceived it as one. UA in many developing nations has been conceptualized as an informal while other scholars view it as merely a survival

or coping strategy for the urban poor (Lemma & Rao, 2013; Odhiambo & Manda, 2003). Rogerson (1998) argued that urban farming should be seen as a small, medium and micro-enterprises which are important in poverty eradication. Moreover, urban farming should be perceived as an act that promotes food security, generates income and assists the “poorest of the urban poor” (Rogerson, 1998).

The conceptualization of urban farming as a survival strategy for the urban poor has been challenged by some scholars. They argued that upper and middle urban income earners were more likely to have large plots, produce more marketable products and high yielding vegetables and sell the proceeds at the city market, in contrast to the low-income groups (Mbiba, 2000; Rogerson, 1998). Thus, the urban poor are often regarded as employees of the rich urban farmers, hence cannot improve their livelihoods.

Furthermore, the earnings from the city agriculture were minimal to have a substantial impact on the lives of the urban poor, some of those that engaged in it were actually poor and others involved in farming as the last option (Frayne *et al.*, 2009). According to Odhiambo & Manda (2003) the scale of production in urban farming is relatively small and therefore absorbs a limited number of people, the returns are relatively low and it rarely provides adequate income to their owners. It is therefore recommended that UA should be seen in terms of the participants and not as an activity of mainly the urban poor (Rogerson, 1998).

2.6 Constraints to vegetable production

Urban farming is one of the informal activities that youth engage in and they face numerous challenges. Studies available indicates that young farmers encounter challenges such as poor organization, insufficient labour, many commitments,

inadequate co-operation, insufficient finances, inadequate government support, poor technical skills, insufficient publicity in Africa [Daudu *et al.*, (2009); Filmer & Fox (2014)]. Farming as a land use in cities encounters stiff competition from other lucrative enterprises and receives insufficient political support (Mbiba, 2000).

Peri-urban vegetable farmers in Cagayan de Oro (Philippines) and cities in Vietnam experienced pest and diseases attack, inadequate capital, insufficient water, low soil fertility, inadequate market facilities and low and unstable vegetable prices (Potutan *et al.*, 1997; Jansen *et al.*, 1996). In Sub-Saharan Africa, it has been reported that theft, pest and diseases, livestock destruction of crops, poor climatic conditions, insecure land tenure, and low soil fertility are the main challenges that urban farmers face [Brooks *et al.* (2013); Ejersa (2011); Foeken, 2013; Hungwe, 2007; Kintomo *et al.*, (1997); Simiyu, 2012; UN-Habitat (2012)].

According to Aphunu & Atoma (2010) youth in Delta State of Nigeria rarely engage in farming because of inadequate incentives from the government, insufficient land for farming, inadequate infrastructure and poor training and extension services. It has been revealed that youth in Kenya lack role models in farming, others have no access to and control over the necessary resources, some of them have negative attitudes towards farming, while others experience insufficient political support and transparency to in the agricultural sector (GoK & KAPP, 2011).

It has been noted that urban farmers have tried to minimize the problems related to vegetable production. Van Veenhuizen (2007) noted that solutions to inaccessibility to land, water and finances included the use of micro-gardens, use of waste water for irrigation, practising of crop rotation, use of cultivars, bio-pesticides and organic manure respectively. Pests and diseases are controlled by applying pesticides and

insecticides (Kintomo, *et al.*, 1997). Other farmers especially from the low income households used recycled untreated seed (Hungwe, 2007; Simiyu, 2012). The main sources of urban farm workers as reported by scholars include; spouses, parents, siblings, relatives, neighbours, friends and hired labourers which varied depending on the economic status of the household (Foeken & Owour, 2000). According to Hungwe (2007), urban farmers in Gweru town in Zimbabwe used juju (traditional medicine) and scare crows to chase away thieves from their farms.

2.7 Existing Policies, Institutions and Processes on youth participation

Existing policies, institutions and programmes play a great role in enhancing access to vital farming assets and achievement of sustainable livelihoods. There are various policy and legal documents that have been fronted by the Kenyan government and have an influence on youth participation in development projects generally.

The Government of Kenya formulated the Kenya National Youth Policy in its efforts to promote youth participation in social, economic and political development in Kenya (GoK, 2007). The Kenya Youth Policy of 2006 (GoK, 2007) advocates for youth empowerment and participation in national issues through engaging the youth at all levels of governance and in decision-making; formation of micro-finance projects to provide credit to the youth; motivate the youth to secure the leadership positions among others.

The Kenya Vision 2030 has been fronted as the economic development blueprint to guide the country in achieving the middle income status by the year 2030 (GoK, 2007). According to this document there is need to raise the average income per person from an estimated Ksh 45,447 (2006) to above Ksh 209,755 (2030) as per the 2006 prices (GoK, 2007). Since agriculture is one of the key pillars to economic

development in Kenya, youth participation in commercial urban farming would increase the average income per person substantially.

According to the National Land Policy (Sessional Paper No.8 of 2009) the government should support vulnerable persons in Kenya, including the unemployed youth and other groups, to secure land and land based resources (GoK, 2009). Access to land for urban farming is critical in ensuring active participation of youth in urban vegetable production.

According to the GoK (2010) the Land Control Act Cap (302) restricts the subdivision of agricultural land to less than one hectare for purposes of issuance of title deeds. This may hinder UA since many plots in urban areas are smaller than one hectare hence cannot be under intensive farming.

The Public Health Act Cap 242 Section 157 (1) prohibits the growing of any crop or the irrigation of any land within the boundaries of a Town or within three miles of such boundaries (GoK, 2012). Urban vegetable cultivation requires intensive irrigation during the dry season to reap maximum produce, therefore these Act negates the necessary conditions for UA.

The government of Kenya has put forward proactive measures to ensure the youth were accessible to funds such as Youth Enterprise Development Fund and Uwezo Fund (Waikenda, 2014). The Kenyan government has a plan to introduce state loans that were affordable and subsidize the prices of fertilizer and farm equipment. Furthermore, according to Waikenda (2014), the Kenyan government has an agenda to fasten the process of leasing agricultural land, providing extension services and facilitating Agricultural Investment Trusts through reduction of taxes levied on private investors in agricultural industry.

2.8 Present study and knowledge gaps

Although, research indicates that youth engage in urban agriculture in Kakamega Town, minimal research has been done to establish the contribution of youth to urban vegetable production in African cities including Kakamega town (Simiyu, 2012; Wegulo, 2013). According to Simiyu (2012) there is limited information concerning the intergenerational sustainability of UA in sub-Saharan Africa especially the role of the youth and their future participation in UA. The present study established the contribution of youth to vegetable production in Kakamega town.

Furthermore, most urban farming studies have established the farming resources accessible to urban farmers (Foeken, 2013; Simiyu, 2012; Wegulo, 2013). Yet, limited research has been done in Sub-Saharan research to assess the farming resources young urban farmers are accessible to and how it influences their future participation in farming. In this study, the farming accessible to young vegetable farmers was assessed.

Several studies exist on the benefit of urban farming on the livelihoods in Africa (Mireri, 2013; Foeken, 2013; Simiyu, 2012; Wegulo, 2013). But, these studies have covered minimally the benefit of vegetable production to livelihoods in Kakamega Town. In this study, the benefit of vegetable farming to livelihood was established.

Many studies have established the challenges facing urban farmers and by extension the young farmers in Africa (Ahaibwe *et al.*, 2013; Adenkule *et al.*, 2009; Brooks *et al.*, 2013; Namwata *et al.*, 2015; Simiyu, 2012). However, very few studies have been conducted to establish how the challenges they are facing young urban vegetable farmers in Kakamega Town. This is what the present study established.

Table 2.1: Summary of literature review and identified gaps

Author	Area Studied	Literature Gap
Adenkule et al (2009)	Constraints to Youth's Involvement in Agricultural Production in Kwara State, Nigeria	Constraints to vegetable production and livelihoods
Ahaibwe <i>et al</i> (2013)	Youth engagement in Agriculture in Uganda: Challenges and prospects	Contribution of youth to vegetable production Farming resources accessible to young farmers Benefit of vegetable production
Brooks <i>et al</i> (2013)	Agriculture as a sector of opportunity for young people in Africa.	Contribution of young people in vegetable production Farming resources accessible to young vegetable farmers Benefit of vegetable production Constraints to vegetable production and livelihoods
Foeken (2013)	The role of Urban Agriculture in the development of Middle-sized Towns: case from East Africa.	Contribution of youth to vegetable production Farming assets accessible to young vegetable farmers
Mireri (2013)	Assessment of the Contribution of Urban Agriculture to Employment, Income and Food Security in Kenya: a case of Kisumu Town.	Contribution of youth to vegetable production Farming resources accessible to young farmers Constraints to vegetable production and livelihoods
Namwata <i>et al</i> (2015)	Access of Urban Farmers to Land, Water and Inputs for Urban Agriculture in Dodoma Municipality, Tanzania	Contribution of youth to vegetable production Access of youth to labour, and extension services Benefit of vegetable farming Constraints to vegetable production and livelihoods
Simiyu (2012)	Gender Aspects of Urban Agriculture in Eldoret	Contribution of youth to vegetable production Farming resources accessible to young

		farmers
Wegulo (2013)	Influence of Social Dimension Issues on Sustainability of Urban Agriculture in Kakamega Town	Contribution of youth to vegetable production Farming resources accessible to young farmers Benefit of vegetable production Constraints to vegetable production and livelihoods

Source: Author (2017)

2.9 Theoretical Framework

This study was informed by the Theory of Planned Behaviour (TPB) and the Sustainable Livelihood Approach (SLA) to assess the extent of youth participation in vegetable production towards improvement of livelihoods in Kakamega Town.

2.9.1 Theory of Planned Behaviour

Theory of Planned Behaviour was developed from the Theory of Reasoned Action, which argued that human behaviour is under volitional control and therefore can be predicted from intentions and subjective norm (Ajzen, 1991; Ajzen, 2002). The main idea of this theory was an individual's intention to perform a given behaviour (Ajzen, 1991). According to (Ajzen, 2002) the theory postulates that human behavior is guided by three types of considerations: Attitude towards behaviour, subjective norm and perceived behavioural control (Ajzen, 1991).

Attitude towards the behaviour includes the degree to which a person has a favourable evaluation or appraisal of the behaviour in question (Ajzen, 1991). In other words, it includes the beliefs about the likely consequences or other attributes of the behavior (behavioural beliefs) [Ajzen, 2002].

Subjective norm refers to the perceived social pressure to perform the behavior (Ajzen, 1991). It also involves the beliefs about the normative expectations of other individuals (normative beliefs) [Ajzen, 2002].

Perceived behavioural control include the perceived ease or difficulty of performing the behaviour and it is assumed to reflect past experience as well as anticipated hindrances and obstacles (Ajzen, 1991). Ajzen (2002) revealed that the perceived behaviour control was included in the Theory of Planned Behaviour with an aim to deal with cases which human beings have incomplete volitional control over the behaviour in question. The concepts of self-efficacy and locus of control were added to the component of perceived behavioural control (Ajzen, 2002).

Self-efficacy just like perceived behaviour control is concerned with perceived ability to perform behaviour. Locus of control is founded on the belief that some of the factors that may promote or hinder performance are internal to the individual (internally located) or external to the individual (externally located - task demands or other people's actions).

This theory proposes that the more favourable the attitude and subjective norm with respect to behaviour the greater the perceived control; the stronger should be an individual's intention to perform the behaviour in question (Ajzen, 1991). Furthermore, when an individual believe that they are accessible to necessary resources and opportunities (skills, money, cooperation of others and time) and they believe that the challenges they are likely to experience few and manageable, they would have the confidence to perform the behaviour (Ajzen, 2002).

The Theory of Planned Behaviour has been used in agricultural studies. Sharifzadeh and his colleagues (2012) used the Theory of Planned Behaviour in establishing the use of agricultural climate information in farming decisions of wheat growers in Far Province in Iran. They used a focus group interviews, structured interviews and structured questionnaires to collect data from 314 wheat farmers. It was revealed that farmers' attitude towards use of climate information was below the average of the items (Sharifzadeh *et al.*, 2012). They also found out that farmers felt very low social pressure to use the climate information in their farm decisions. They observed that farmers' perception on power to control beliefs was almost high and therefore had complete control over their behaviour (to use climate information in farming decisions).

Clark-Richardson (2003) applied the Theory of Planned Behaviour in predicting attendance at environmental horticulture extension programs in Florida, United state of America. She gathered information using questionnaires mailed to 3000 horticulture professionals in Florida. In her studies, those that attend horticulture-based extension programs had a more positive attitude towards attending those programs than those who rarely attend. She also reported that those who attended extension programs had higher perceived knowledge levels about the extension services and Institute of Food and Agricultural Services than those who rarely attend. However, the list is not exhaustive but includes the most relevant to the current study.

This theory was critical in explaining the reasons of the youth participation in vegetable production in Kakamega Town (attitude towards behaviour). Furthermore, a behavioural intention could be expressed in behaviour only if the behaviour under

consideration is under volitional control - if the person could decide willingly to perform or not to perform the behaviour. Youth farmers decide to engage in farming because of their own volition or decisions.

This theory was essential in explaining the role of other individuals (social norms or subjective norms) in influencing access to farming resources and minimizing challenges to vegetable production. Young farmers obtained land, financial assistance, farm inputs, agricultural information and skills and farm labour other people such as parents, siblings, neighbours, friends, mass media and the county government).

The performance of most activities relied to some extent on non-motivational factors such as availability of necessary resources and opportunities (perceived behavioural control). The more resources and opportunities people believe they possess and minimal constraints they anticipate, the greater should be their perceived control over the behaviour. Thus, this theory was critical in understanding the influence of access to farming resources and the constraints to vegetable production on participation in vegetable production in Kakamega Town.

However, Kraft *et al.*, (2005) raises some fundamental concerns about the multi-dimensionality of perceived behavioural control, the disparities in definitions and operationalization of empirical research in perceived behavioural control, whether perceived behavioural control is simply a complementary way of measuring attitude and whether perceived behavioural control can be distinguished from intentions. The limitation of perceived behavioural control was beyond the scope of this study.

2.9.2 Sustainable Livelihood Approach

This study adopted a theoretical approach based on the Sustainable Livelihood Approach (SLA). The origin of Sustainable Livelihood as an approach is greatly

indebted to the works of Robert Chambers at the Institute of Development Studies in 1992 (Solebury, 2003). Farrington *et al.* (2002) revealed that the objective of SLA is to enhance the sustainability of people's welfare, with prime focus on the lives of poor men, women and households. The developmental principles of SLA include: people-centred; differentiated; multi-level; co-ordinated (conducted in partnership); sustainability; portfolios; and holistic.

Sustainability has two main dimensions namely intragenerational sustainability (social, economic and environmental) and intergenerational sustainability. Chambers & Conway (1999) noted that intergenerational sustainability incorporates transfer of skills, tools, assets and knowledge from one generation (parents) to the children (sons and daughters) as well as the children (daughters and sons) old enough migrate to new places or joining other jobs. SLA as an analytical framework has 5 components namely: vulnerability; livelihood assets; policies, institutions and processes; livelihood strategies; and livelihood outcomes (Meikle *et al.*, 2001; Oxfam, 2009; Scoones, 1998).

Vulnerability is a state of insecurity of well-being of individual or communities in the state of ecological, social, economic, political in the form of sudden shocks, long term trends or seasonal cycles (Farrington *et al* 2002). Vulnerability is two-fold in that it has external side of risks, shocks and stress and an internal side is defenselessness (Chambers & Conway, 1991). In an urban set-up, poor young men and women have a high chance of being susceptible to certain shocks and crises. According to Scoones (1998) vulnerable people are those unable to cope (temporary adjustments) or adapt

(long term shifts in livelihood strategies) and are mostly unable to achieve sustainable livelihoods hence live in a state of vicious cycle.

Farrington *et al* (2002) defined assets as resources on which individuals obtain from so that they can carry out their livelihood strategies. The availability of assets, the capacity to manage them and to transform them into money, food and other vital necessities enables them to avoid susceptibility (Meikle *et al*, 2001). FAO (2010) suggested that assets act as collateral and access to resources is essential in enhancing sustainable livelihoods. Farrington *et al* (2002) emphasizes that people have various levels of access to and control over the assets. The assets include: financial, human, social, natural and physical which forms a pentagon (Oxfam, 2009).

Financial capital includes the availability and accessibility of affordable credit. Scoones (1998) noted that the capital base is critical for the achievement of Sustainable Livelihood. At the household level, human capital comprises the diverse knowledge and skills of women and men, the traditional knowledge of the older generation, and the new learning outcomes of the youth (Prain & Lee-Smith, 2010; Meikle *et al*, 2001). Natural capital involves the amount and quality of accessible land, soil, air water and environmental services (hydrological cycle and pollution) from which resources flows and services useful for livelihoods are obtained (Prain & Lee-Smith, 2010; Scoones, 1998; Lemma & Rao, 2013).

Physical capital entails the houses (buildings), equipment, and domestic poultry ownership, transport of seeds and other inputs (Meikle *et al*, 2001; Prain & Lee-Smith, 2010). Social capital encompasses a network of support, social claims, social relations, affiliations and associations that may exist within and between households and within communities which people can use to get loans, child care support, food

and accommodation (Meikle *et al* 2001; Scoones, 1998). It also incorporates access to information about opportunities and challenges like casual labour markets information (Meikle *et al*, 2001).

Chambers & Conway (1991) reported that claims and access are the intangible assets of a household. Claims are made for material, moral or other practical support or access (Chambers & Conway, 1991). The claims are often made at times of stress or shock and are made on individuals or agencies, on relatives, neighbours, patrons, chiefs, social groups or communities or NGO's (Chambers & Conway, 1991). Access includes the opportunity in practice to use a resource, store or service or to obtain information, material, practice, employment, food or income (Chambers & Conway, 1991).

Farrington *et al* (2002) suggested that Policies, Institutions and Processes (PIPs) comprises of social, economic, political and environmental factors that influence people's preferences and help to sculpture livelihood such as institutions, organizations, policies or legislation. Prain & Lee-Smith (2010) noted that the institutions include markets, local government, education organizations, policies and regulations concerning use of land and water resources. FAO (2010) argues that laws, traditions and social norms often restrain women from getting equitable access to and control of assets. Scoones (1998) noted that institutions are critical in understanding processes, allows the identification of restrictions and opportunities to SL; gives insight on the social processes which affect livelihood sustainability.

According to Chambers & Conway (1991) complexity and diversity are the nature of the livelihood strategies of most poor households. Some do adopt specialized strategies which depend on a single activity or source of support but most are flexible [Chambers & Conway (1991); Meikle *et al.*, (2001); Scoones (1998)]. Scoones (1998) indicated that degree of diversification or specialization may influence the available resources and the risk level. Several members of households do a variety of things. The livelihood strategies of poor households vary by region, community, social group, gender, age, season and time in history (Chambers & Conway, 1991).

Livelihood strategies are meant to build asset bases and access to goods and services for consumption (Farrington *et al* (2002); Prain & Lee-Smith (2010). Meikle *et al* (2001) argues that short-term initiatives are pursued out of necessity (reducing expenditure) and long –term strategies aim to invest in future ability to build livelihoods. However, livelihood strategies adopted are determined by the assets and pathways available, chances in vulnerability and choices or preferences of men and women (Farrington *et al*, 2002).

The landownership in most African countries promotes strong connections to rural areas among the urban families (Lesetedi, 2003; Foeken, 2013). Such land is frequently viewed as security when there is no employment in cities and towns. This provides an informed position of the diversification that the low-income urban dwellers engage in when they fail to secure employment in the urban areas. Although urban migrants rarely use the land as a security to obtain loans required for enhancing productivity of the farms (Lesetedi, 2003).

However, the rural-urban connections are multi-directional in that money is remitted by urban labour force to the rural homes while foodstuffs, meat, fish, vegetables *inter alia* which are relatively costly to acquire in urban centres are sent to the urban areas (Lesetedi, 2003). Lee-Smith & Memon (1994) indicated that a high percentage of urban households grow part of their food in the urban centres where they live, or in rural areas or both. This underpins the importance of rural-urban connections at a household level for food production for a large proportion of urban Kenya (Lee-Smith & Memon, 1994).

The effects of household's strategies and response to the vulnerability and asset bases may be virtuous or vicious (Farrington *et al.*, 2002). The successful strategies lead to build up of asset bases that reduce shocks and stresses as opposed to poor livelihood results which deplete asset bases thereby leading to vulnerability. Meikle *et al* (2001) defined livelihood outcomes as the results of people's success or failure in changing through diversification of the assets available to them into income or basic commodities. However, the effect on the household members is not equal because some household members have more power than others (Meikle *et al.*, 2001). Livelihood impacts can in turn exert positive and/or negative ecosystem feedback on the livelihood assets through increasing or decreasing certain capitals and on the context of vulnerability (Prain & Lee-Smith, 2010).

Some scholars have used the framework in their urban livelihood studies. Simiyu (2012) noted that the urban households in Eldoret were vulnerable to shocks and risks due to closure of manufacturing and processing industries leading to lay-offs of many people forcing them to seek jobs in the informal sector, harassment and harsh

enforcement of by-laws and policies, destruction of small shops along the roads and inadequate provision of sewerage services, post-election violence and spread of diseases from livestock. He added that senior municipal officers and government officials engaged in farming as well as a relaxation on implementation of by-laws during election periods. The urban farmers in Eldoret cultivated crops, reared livestock and engaged in non-agricultural activities to promote their livelihoods. These farmers were accessible to land, water, finances, labour, extension services and social networks. Simiyu (2012) revealed that farming was important in food provision and improve nutrition, saving on food expenditure, income generation, economic independence, use of available space, a hobby / leisure and as part of culture. He noted that farmers experienced farming challenges such as pests and diseases, theft of crops, rainfall unreliability and variability, crop destruction by livestock, poor soil, lack of land titles to be used as collateral to secure financial resources, inadequate land for expansion of farming, inadequate financial resources, and inadequate of extension services.

Kadozo (2009) used the Sustainable livelihood Approach in her thesis entitled: Sustainable Livelihood Approaches: The Future for Income Generating Projects in Urban Areas? An Evaluation of Five Income Generating projects in Tembisa, South Africa. She collected the data using document study, interviews and focus group discussions from five income generating projects. She found out that the urban poor were accessible to livelihood assets such as human capital, financial capital, social capital, physical capital and natural capital. The vulnerability was manifested in form of high levels of unemployment and underemployment, low technical skills, environmental degradation, inadequate housing, and old infrastructure. She revealed that the poor engaged in baking cookies and selling them, renting out rooms, sewing

pillows and duvets, selling food to teachers and snacks to children at school during breaks and growing of food and vegetables to earn a living. According to Kadozo (2012) the Christian Social Council was instrumental in enabling the project members to start up equipment and raw materials. The projects led to: acquisition of skills such as baking, sewing and organic farming; improved food security and nutritional status at household level, increased income generating opportunities, enhanced self-worth and increased social networks (Kadozo, 2009).

The SLA was applicable in this study since it could explain the functions of institutions such as KARI, Department of Agriculture and local administration which have positive as well as negative effects on the youth participation in vegetable production in Kakamega Town. This approach was essential in identification of the vegetable agricultural practices that have been adopted by young farmers without any technical support from the developmental agencies and Non-Governmental Organizations (NGO's) (Krant, 2001).

Furthermore, this approach was significant in understanding the linkages between young people's livelihood strategies, their asset status and their mode of using available natural assets (Krant, 2001). This theoretical framework was important in explaining the positive contributions of vegetable production on the livelihoods of the youth in urban households in Kakamega Town (Krant, 2001). The SLA provided a platform for understanding and explaining the livelihood strategies of different generations to counter shocks and risks utilizing the available resources supported by various policies, institutions and processes.

However, this is not an exhaustive list but some of the most relevant to study since they are based in Africa and Kenya. The settlement pattern in Kakamega Town is that

the rich, the middle-income earners and the low-income earners live in the same neighbourhood (Krant, 2001).

2.10 Conceptual Framework and Model

The conceptual model provided a platform on which the problem was understood. The proposed model integrates the main ideas of the TPB theory and the SLA approach. The independent variable includes the contribution of youth to vegetable production. It was conceptualized in terms of level of participation, time spent working on the farm per week, length of participation, time when youth participate in vegetable production, trend of farm sizes, future participation, types of vegetables cultivated, reasons for cultivation of vegetables and other livelihood activities (Figure 2.3). This was conceived from the component of SLA (livelihood strategies) whereby poor households engage in a variety of activities to promote their livelihoods. It also borrows heavily from the Theory of Planned behaviour where by positive attitudes (reasons for involvement in vegetable farming) towards behaviour (vegetable farming) encourages performance of a behaviour (involvement in vegetable farming).

Vegetable production greatly influences the level of food supply, income generation, participation in social and political issues and environmental sustainability. The dependent variables were proposed to be the benefit of vegetable production to livelihood (livelihood outcomes) and they included adequacy of food supply from vegetable production; amount of income obtained from vegetable sales; uses of money obtained from the vegetable sales; participation in social and political issues; and environmental challenges related to farming as represented in Figure 2.3.

The TPB and SLA were important in selecting the intervening variables. The perceived behavioural control component of TPB and the livelihood assets and policies, institutions and processes (PIPs) component of SLA formed the basis of intervening factor. In this model, these variables include: access to farming resources

(assets); constraints to vegetable production and policies, institutions and processes in Kakamega Town; (Figure 2.1).

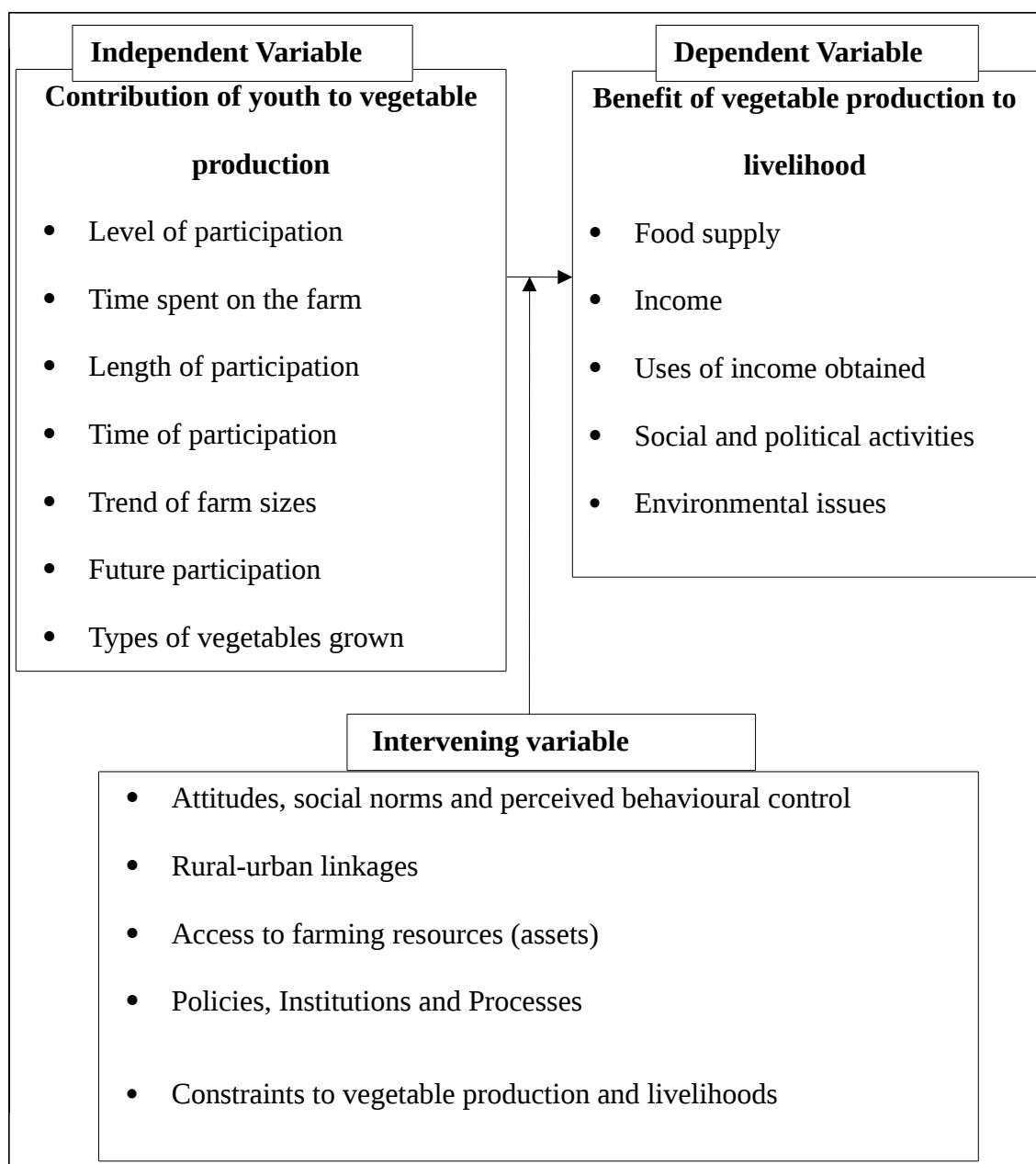


Figure 2.1: A Conceptual model of cause-effect relationship between youth participation in vegetable production and livelihoods. Source: Author (2017)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research design, target population, accessible population, sample size, sampling techniques and procedures, data collection instruments and procedure, research procedure, data analysis techniques and procedure, quality data control and ethical concerns.

3.2 Research design

This study adopted a survey research design. This research design was relevant in this study because it enabled the researcher to explain the contribution of youth participation in vegetable production towards improvement livelihoods in Kakamega Town.

3.3 Target population

The study targeted youth engaging in urban farming vegetable production and key informants. There were households with youth engaging in vegetable production in Kakamega Town. The key informants included: purposively selected youth farmers, estate elder and the agricultural officer in Kakamega Town.

3.4 Accessible population

There were three hundred and seventy two (372) vegetable farming households in the study area, one (1) estate elder and two (2) agricultural officers.

3.5 Sample size

The sample size of this study was determined through estimate from the formulae proposed by Yamane which states that:

$$n = \frac{N}{1 + N(e)^2}$$

Where n = sample size (see calculations below), N = population size (372 vegetable farming households and e = level of precision in this case (6% = 0.06), therefore

$$\begin{aligned} n &= \frac{372}{1 + 372(0.06)^2} \\ n &= \frac{372}{1 + 372 \times 0.0036} \\ n &= \frac{372}{1 + 1.3392} \\ n &= \frac{372}{2.3392} \end{aligned}$$

Sample size (n) = 159 vegetable farmers

The distribution of the 159 vegetable production farmers in the three estates was as follows.

Table 3.1: Distribution of the farmers in the three settlement areas

Settlement area	Calculation	Sample size
Amalemba	$\frac{127}{372} \times 159 = 54$	54 youth farmers
Matende	$\frac{53}{372} \times 159 = 23$	23 youth farmers
Mundiri	$\frac{192}{372} \times 159 = 82$	82 youth farmers
Total		159 youth farmers

Source: Field Reconnaissance (2013)

The 159 youth farmers that participated in this study were selected based on the following considerations: (1) they were aged between 18 and 35 years, (2) they were

engaging in vegetable production and (3) the youth's vegetable plot must be within Kakamega Town.

3.6 Sampling techniques and procedures

Proportionate random sampling was adopted in selecting the households. Each farming household was assigned numbers from 1 to 127 for Amalemba, 1 to 53 for Matende and 1 to 192 for Mundiri which were indicated on pieces of paper and placed in three separate boxes for the respective estates. The papers were picked randomly and the number chosen formed the sample and replaced to enhance equal probability. In the event that the number was picked the second time it was returned in the box and then shaken. During data collection, if the youth engaging in vegetable production was absent within the targeted household then the farmer was traced through a phone call. In case he or she was unavailable during the period of the study, then he or she was replaced by random picking. This were only three (3) vegetable farmers who were replaced due to being absent during the study period.

After the collecting data from the 159 youth farmers by self-administered questionnaires, sixteen (16) youth vegetable farmers were selected purposively for the interviews. The selection was based on gender, parenthood, amount of income obtained from vegetable sales, and willingness and availability to reveal more information. Eight (8) male and eight female youth who were parents willing to participate and were available, and earned more than Ksh 200 per day from vegetable sales were selected. The Estate elder and Agricultural officer were selected purposively based on the nature of their jobs.

3.7 Data collection instruments and procedure

Both quantitative and qualitative data were collected. Structured questionnaires were administered to 159 youth vegetable farmers in order to collect quantitative data. The youth that were able to respond to the questionnaire on their own were 124 while 35 youth were assisted by the researcher to fill the questionnaire. Sixteen (16) youth vegetable farmers were interviewed guided by interview schedule. Moreover, the estate elder of the study area and the County Agricultural officer of Kakamega were interviewed guided by an interview schedule. Photographs were used to supplement data collection.

3.8 Research procedure

In the preparation for writing of the proposal, it was necessary to carry out a reconnaissance and census for vegetable farming household in the study area. The reconnaissance was carried out between 30th May and 5th June, 2013. This was essential in familiarizing with the study area and mapping the households in which the youth engaged in vegetable production within the study area. Due to absence of up-to-date data on urban vegetable producing households, a census was carried out between 12th and 17th August, 2013. After the presentation of the research proposal in September 2013, a pre-testing of the data instruments was carried out and refined in March, 2014.

Permission was sought from the School of Arts and Social Sciences, Moi University Main Campus. Data collection was conducted in April 2014 after the questionnaires pre-tested among 16 households in Kakamega Town who were excluded in the final study. This is because these youth would have formed a different opinion and therefore give a different view during the actual field study. The interviews which led

to generation of qualitative data from the key resource persons were done between May and June, 2014.

3.9 Data analysis techniques and procedure

Statistical Package for Social Science (SPSS package 16.0 version) and Microsoft Excel version 2010 programme were used to analyze data. SPSS offered an opportunity to deal with different kinds of quantitative data that could be analysed. During the preparation of the questionnaire, all the variables under the following sections: demographic characteristics, contribution of youth to vegetable production, access to farming resources, benefit of vegetable production to livelihood, and constraints to vegetable production were entered in the variable window of the SPSS programme.

After data had been collected, the filled questionnaires were used to enter information in the data window of the SPSS programme. The data was cleaned and eventually analyzed in form of descriptive statistics such frequencies counts, percentages, mean and standard deviation, and Pearson Moment Correlation Analysis. The analysed data was exported to the Microsoft Excel Programme for data presentation in form of graphs. This is because the Microsoft Excel programme produces graphs with a good visual impression compared to the one generated by SPSS programme

Furthermore, a 3-point scale was used assess the level of involvement in farming management activities in order of importance from, Never Involved = 1, Rarely involved = 2 and Always involved = 3. The mean score for each of the practices was calculated and the grand mean scores of all the practices was divided by the number of practices to determine the level of participation of youth in vegetable production in

the area of study (Bello *et al.*, 2011). The scale below was used to determine the level of participation for each practice involved in vegetable production.

Level of Participation	Participation Index Score
Always involved	2-3
Rarely involved	1-2
Never involved	0-1

In addition, Pearson Moment Correlation Analysis was used to test whether there is no significant relationship between time spent on the farm per week and the youth's age, years in formal school, household size, farming experience, and plot size.

Furthermore, the respondents were to state their level of agreement on Likert Scale of 3. Strongly Agree = 3, Agree = 2 and Unsure = 1 to establish how access to land influences their participation and the grand mean value of above 2 was considered favourable whereas less than 2 were considered unfavourable. Also, the respondents were asked to state their level of agreement on how access to water influences vegetable production on Likert Scale of 4 {Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1}. The analysis was done whereby the mean above 3 implied the commonest influence and the mean below 3 implied least influences.

3.10 Quality data control

The questionnaires were pre-tested among 16 youth vegetable farmers who were distributed as follows: 5 farmers in Amalemba, 5 farmers in Matende and 6 farmers in Mundiri who were randomly selected from the vegetable farmers. The data obtained by the pre-testing questionnaires was entered in SPSS programme, analysis was done and the results provided a platform for modification to improve the validity. In

addition, the data collection instruments were given to two experts (Professor Omondi Paul and Mr Kareri Raphael) in the field of research to establish the content of each item. The two experts recommended changes that were done before the final data was collected. To enhance reliability, only those respondents who were willing to cooperate were given questionnaire to fill and were interviewed.

3.11 Ethical concerns of this study

The respondents were provided with adequate information about the nature of the research and the purpose of the research findings for them to make an informed decision whether to participate or not. There was no form of coercion for a person to participate or harassment for those who did not want to participate. The consent was obtained orally. Every questionnaire was labelled by use of alphabetical letters to protect their identity. Furthermore, the photographs taken and their subsequent use in the final thesis were done after permission was sought from the respondents.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the research findings and discussions of the study. It includes the demographic characteristics of the youth, the contribution of youth to vegetable production, farming resources accessible to vegetable farmers, benefit of vegetable production to livelihoods and constraints to vegetable production and livelihoods as discussed below:

4.2 Respondents' characteristics

The respondents' characteristics include: age, gender, ethnic background, education level, relationship with household head, employment status, household size, place of birth, and reasons for migration to Kakamega Town. The summary of the demographic characteristics are indicated in Table 4.1. Some of the respondents (42.2 %, n = 67) were aged between 18 and 23 years (30.8 %, n = 49) were aged between 24 and 29 years and a few of the respondents (27.0 %, n = 43) were in the age group of 30 and 35 years. Majority of the respondents (74.2 %, n = 118) were women while a few youth (25.8 %, n = 41) were men.

More than three quarters (79.2 %, n = 126) of the respondents belong to Luhya community, (9.4 %, n = 15) said they were from Luo community, (8.2 %, n = 13) revealed that they belong to the Kisii tribe, (1.3 %, n = 2) indicated that they were Kikuyus, (0.6 %, n = 1) said they were from Teso tribe, (0.6 %, n = 1) reported that they belonged to the Kamba community and the remaining (0.6 %, n = 1) noted that they were Kalenjins.

Table 4.1: Respondents' characteristics of respondents

Demographic characteristics	Frequency	Percent (%)
Age group (years)		
18 – 23	67	42.2
24 - 29	49	30.8
30 – 34	43	27.0
Gender		
Male	41	25.8
Female	118	74.2
Ethnic background		
Luhya	126	79.2
Luo	15	9.5
Kisii	13	8.2
Kikuyu	2	1.3
Teso	1	0.6
Kamba	1	0.6
Kalenjin	1	0.6
Educational level		
Primary	34	21.4
Secondary	61	38.3
College	44	27.7
University	19	12.0
No formal	1	0.6
Relationship with household head		
Female-managed	53	33.3
Daughter/son	51	32.1

Co-heads	37	23.3
Male-headed	14	8.8
Other relatives	3	1.9
Employees	1	0.6
Nature of employment		
Self –employed	84	52.8
Temporary	41	25.8
Permanent	34	21.4
Household size		
1-2	25	15.7
3-4	108	67.9
5-6	26	16.4
Place of birth		
Kakamega Town	73	46.0
Other places	86	54.0
Reasons for migration*		
Looking for jobs	49	30.8
Join spouse	19	12.0
Education	8	5.0
Visit relatives	7	4.4
Better life	5	3.1

Source: Field survey (2014) * Multiple responses therefore the total does not add to 100.0%

With regard to level of education, some (38.4 %, n = 61) had secondary education, others (21.4 %, n = 34) had primary education, another group (27.7 %, n = 44) had college education, (11.9 %, n = 19) had university education and only (0.6 %, n = 1) had no formal education. About a third of the households (33.3 %, n = 53) were female-managed, some (32.1 %, n = 51) were daughters/son to household heads,

others (23.3 %, n = 37) were co-heads, others (8.8 %, n = 14) were male heads, a few (1.9 %, n = 3) were female relatives and only (0.6 %, n = 1) of the youth farmers were employees.

More than half of the respondents (52.8 %, n = 84) were self employed (e.g. farming, small business, tailoring etc), 25.8 % (n = 41) were employed temporary (e.g. house help, football player, casual labourers in construction sites and farms etc) and 21.5 % (n = 34) had permanent employment.

The mean household size of farming households was 3 members. A majority of the households (67.9 %, n = 108) had between 3 and 4 members and few (15.7 %, n = 25) had between 1 and 2 members. Forty six percent (46.0 %, n = 73) of respondents were born in Kakamega Town whereas fifty four percent (54.0 %, n = 86) of the youth had migrated to Kakamega Town from other localities. It was established that about three in every ten youth (30.8 %, n = 49) had migrated to seek for jobs, 12.0 % (n = 19) to join spouse, 5.0 % (n = 8) for education, 4.4 % (n = 7) to visit relatives and 3.1 % (n = 5) for better life.

4.3 Contribution of youth to vegetable production

The first objective of this study was to establish the contribution of youth to vegetable production. This objective was achieved through the examination of the following items: level of youth participation in vegetable production practices, length of time spent on the farm per week, when youth participate in vegetable cultivation, length of time youth have participated in vegetable production, trend of youth involvement in vegetable production, future participation of youth in vegetable production. It also entail: the type of vegetables grown by youth, reasons for youth participation in

vegetable production, perceptions on why some youth do not engage in vegetable production, reasons for participation in other economic activities.

4.3.1 Level of participation in vegetable production

It was critical to establish the level of youth involvement in the various vegetable production practices. The level of involvement was analysed and tabulated as shown in Table 4.2.

Table 4.2: Youth participation index indicating level of youth's participation

Production practices	Mean score
Weed control	2.64
Land preparation	2.58
Harvesting	2.57
Planting	2.51
Irrigation	2.43
Selling	2.27
Pest and disease control	2.18
Procurement of farm inputs	2.06
Grand Mean Score	2.41

Source: Field Survey (2014)

The youth engage always in weed control (mean = 2.64), land preparation (mean = 2.58), harvesting (mean = 2.57), planting (mean = 2.51), irrigation (mean = 2.43), selling (mean = 2.27), pest and disease control (mean = 2.18), and procurement of farm inputs (mean = 2.06) in vegetable cultivation. The grand level of youth participation in urban vegetable production (mean = 2.41) indicates that youth engaged always in all the main production practices. A female farmer from Mundiri Estate said; “ (...) *tilling the land and weeding of vegetable gardens is an activity for those who were still energetic – (youth).*” (Interview, 12 June, 2014)

This implies that most youth engage in weeding and tilling the garden because they were still energetic and could provide labour that is associated with it (Agbonlahor *et al.*, 2007).

4.3.2 Length of time spent on the farm per week

The amount of hours spent on the farm per week on their farm after planting was as shown Figure 4.1. The average time that the youth spent on their vegetable gardens was four hours and thirteen minutes with standard deviation of 1.58 hours (1 hour and 35 minutes).

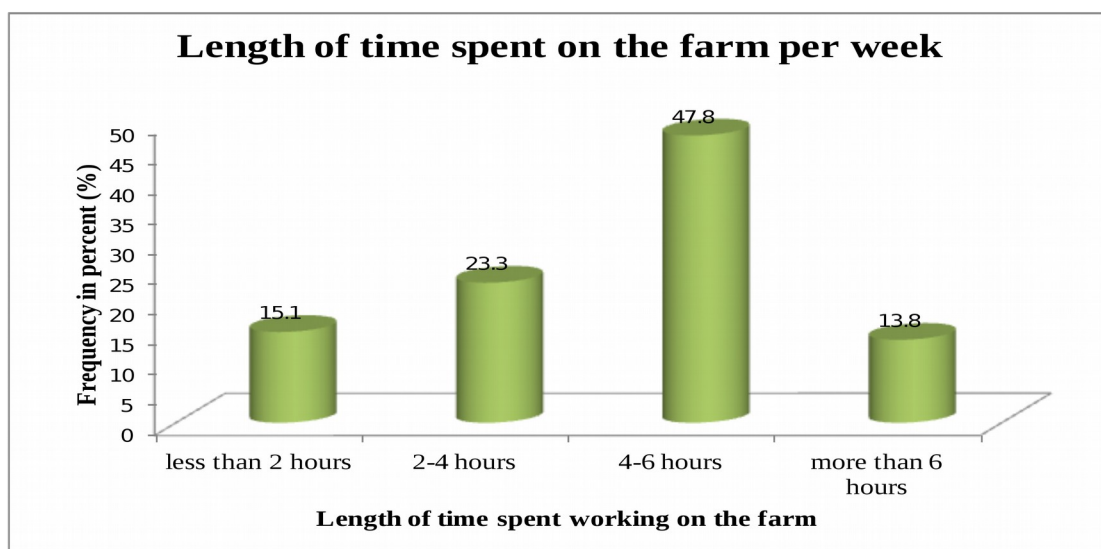


Figure 4.1: Length of time spent on the farm per week. Source: Field survey (2014)

Some of the youth (47.8 %, n = 76) engage in vegetable production between four and six hours per week whereas a few (13.8 %, n = 22) engaged in farming for more than six hours per week.

It was critical to establish the factors that influenced the length of time spent on the farm. The correlation analysis results are as shown in Table 4.3 below:

Table 4.3: Correlation analysis showing the factors influencing length of time spent on vegetable farm

Variable	Pearson Correlation	Sig. (2-tailed)	Significance
Age	0.17	0.04	S*
Years in formal school	0.10	0.21	NS
Household size	0.01	0.95	NS
Farming experience	0.05	0.47	NS

Plot size	0.06	0.02	S*
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Source: Field Survey (2014) *correlation is significant at the 0.05 level (2 – tailed). NS = Not Significant

The results from Table 4.3 indicate that there is a significant relationship between youth's age and plot size with the length of time youth spent on farm per week. This implies that for every unit increase in years of age and size of the plot there was a positive increase in the time spent on the vegetable farm. However, the length of time spent on the farm did not vary with years of formal education, household size and farming experience.

4.3.3 When youth engage in vegetable production

It was necessary to establish the time that youth engage mainly in vegetable production because some of the youth were students, government employees, self employed and unemployed.

Table 4.4: Time of the day when youth engage in vegetable production

Time of participation	Frequency	Percent
In the afternoon during week days	63	39.6
In the morning and afternoon on weekends	33	20.8
In the morning and afternoon on week days	28	17.6
In the morning on weekdays	19	12.0
In the morning and afternoon during holidays	16	10.0
Total	159	100.0

Source: Field Survey (2014)

It was revealed that about four in every ten youth (39.6 %, n = 63) engaged in vegetable farming in the afternoon during week days whereas one person in every ten youth (10.0 %, n = 16) reported engaging in vegetable farming in the morning and afternoon during school holidays (April, August, December) when they were free within Kakamega Town (Table 4.4). This finding coincides with the findings of

Ngome & Foeken (2010) where they found out that a half of urban farmers (50%) in Buea in Cameroon worked on their gardens in the evening.

A male farmer from Mundiri Estate said: “ (...)I normally engage in vegetable cultivation when I am free like today and out of lecture rooms or library. I spare some one or two hours to work on my farm.” **(Interview, 12 June, 2014)**

A female farmer from Mundiri estate said: “..When am on night duty I do the weeding during the day. Sometimes I do the weeding of the garden in the morning when I am on duty in the afternoon or evening.” **(Interview, 12 June 2014)**

The youth could integrate vegetable production with other livelihood activities which are necessary for achievement of sustainable livelihoods. Therefore, urban vegetable production could supplement the income for urban dwellers engaging in other economic activities.

4.3.4 Length of time youth have participated in vegetable production

The respondents were asked when they began producing vegetable within Kakamega Town and the responses were as represented in the Figure 4.2. About a third of the respondents (29.6 %, n = 47) have been engaging in vegetable production between two to four years whereas 9.4 % (n = 15) have been cultivating vegetable within Kakamega town for more than 8 years (Figure 4.2). This could be attributed to the fact that some of the youth had migrated to Kakamega Town recently.

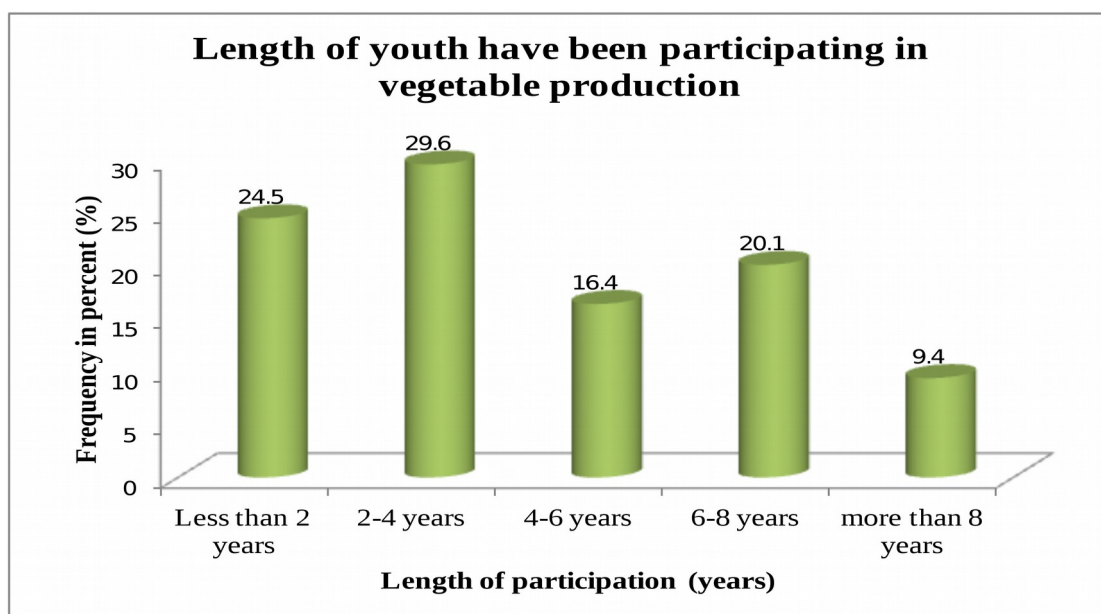


Figure 4.2: Length of youth participation in vegetable production. Source: Field Survey (2014)

4.3.5 Trend on the sizes of land under vegetable production

The respondents were asked to state whether their farm size had been increasing, declining or remained the same. Their responses were analysed and tabulated as shown in Table 4.5 below:

Table 4.5: Trend of vegetable production

Trend of Vegetable farm size	Frequency (N = 159)	Percent
Increasing	114	71.7
Declining	27	17.0
Remained the same	18	11.3
Total	159	100

Source: Field Survey (2014)

About seven in every ten of the respondents (71.7 %, n = 114) noted that their vegetable farm sizes had been increasing since they began cultivating whereas a few (11.3 %, n = 18) said the farm size had remained the same (Table 4.5). Therefore, majority of the farmers were contributing positively to the acreage of land under vegetable production.

4.3.6 Future youth participation in vegetable production

It was necessary to establish whether the youth would continue to participate in urban vegetable production in order to determine the contribution of youth to vegetable production over time. It was revealed that a majority of respondents (90.6 %, n= 144) would continue to participate in vegetable production in future while a few (9.4 %, n = 15) of the respondents would not. This implied that majority of the youth that were currently engaging in urban vegetable would continue to do so in future. This could be attributed to the benefit accrued from the same. It was established that the youth currently engaging in vegetable production would encourage their children to engage in vegetable production within the town boundary because it was a source of food, income and it saves on the normal expenditure at home.

A female farmer from Matende Estate said:

*“I have been cultivating vegetables in Kakamega Town for quite some time. Although I have encountered some challenges, I will continue until my children take over. I normally encourage them to appreciate farming and I am ready to support them in future.”***(Interview, 12 June 2014)**

The intergenerational sustainability of urban farming was manifested through future participation of youth in urban vegetable production and the encouragement of the future generations to participate in urban vegetable production.

Some youth farmers argued that their children were not involved in vegetable production because they were occupied with academics and therefore had no time to engage in farming.

A female farmer from Amalemba estate when asked whether her children were supporting her in vegetable production said the following:

“My children do not participate in vegetable production because they are in school most of the time and also leave school very late at around 7 p.m. During the holidays they have school tuition and sometimes they do not want to weed. They believe that farming is an activity of parents especially mothers. They want to be enticed with 20 shillings or 50 shillings” (Interview, 13 June 2014)

It could be deduced from above statements that the children of the farmers did not engage in farming because they have been busy with academic work since they were children while others want to be paid in order to engage in vegetable production.

However, other parents noted that some children preferred to play most of the time during weekends while other children were just lazy as indicated by the interview below (Female farmer):

“I normally employ someone to assist me in cultivation of vegetables because I cannot manage on my own. My two nephews rarely stay at home even during weekends or holidays to cultivate vegetables. One of them trains as a footballer during weekends while the other one just idles and roams around the estate with his friends.” (Interview, 13 June 2014)

Therefore, some youth farmers revealed through interviews that the some of the reasons why the children were not engaging in vegetable production in was due to participation in sports during weekends and laziness.

4.3.7 Types of vegetables grown by youth

The youth in Kakamega Town grew various types of vegetables which were either traditional and/or exotic.

Table 4.6: Types of vegetables produced

Vegetables cultivated	Frequency *	Percent
Sukuma wiki (Kales)	141	88.7
Suja (Black night shade)	67	42.1
Saga (Spider plant)	19	12.0

Tsimboga (Amaranthus Spp)	18	11.3
Pumpkins leaves	4	2.5
Kunde (Cow peas)	3	1.9

Source: Field Survey (2014), *Multiple responses hence the total does not add to 100%)

Most of youth (88.7 %, n = 141) grew Sukuma wiki (kales) whereas a few of the farmers (1.9 %, n = 3) cultivated cow peas (Table 4.6). It could be concluded that the youth engaged more in exotic vegetable production.



Plate 1: Type of vegetables grown. Source: Field Survey (2014)

4.3.8 Reasons for youth participation in vegetable production

Most urban dwellers engage in farming mainly for food production while others to reduce the food expenditure, generate income, for social and cultural reasons.

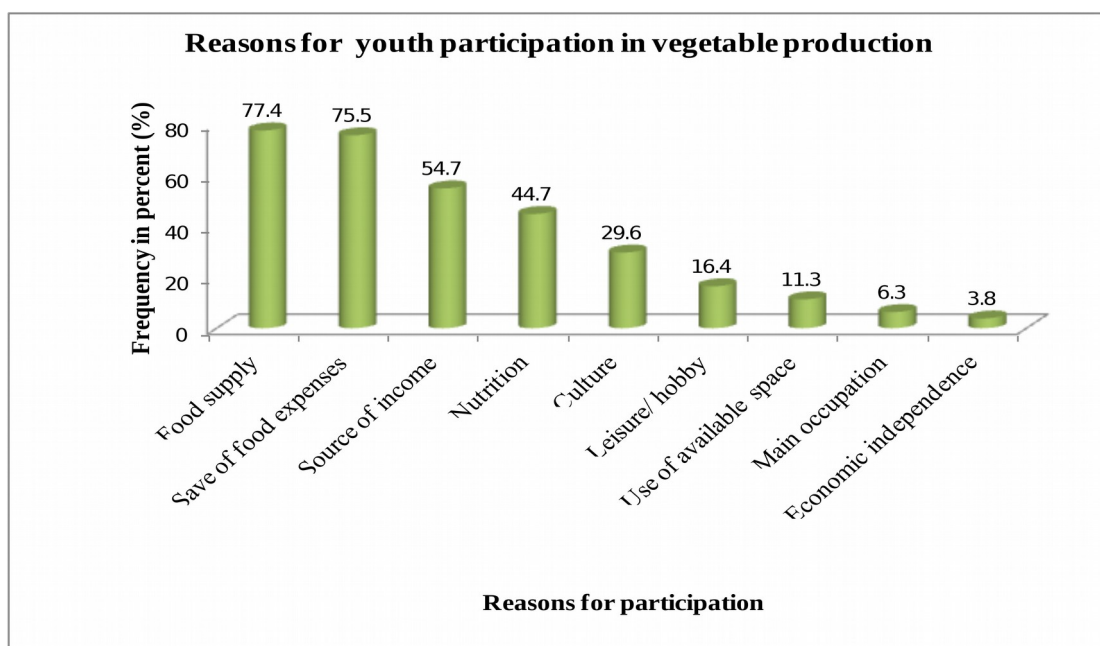


Figure 4.3: Reasons for vegetable cultivation. *Multiple responses hence the total does not add to 100% Source: Field Survey (2014)

Majority of the respondents (77.4 %, n = 123) indicated that they grew vegetables for food whereas only (3.8 %, n = 6) of them grew vegetables to gain economic independence (Figure 4.3). This implied that vegetable production was important for youth in enhancing food security, saving on food expenses and as a source of income. Some of the youth do engage in urban vegetable production as a source of better nutrition as other studies have established (Memon & Lee-smith, 1993), while other youth for employment, utilize available space and gain economic independence, for leisure and to express culture.

4.3.9 Reasons on why some youth do not engage in vegetable production

It has been widely documented that some youth perceive agriculture negatively as an alternative source of livelihood. When the respondents we asked whether there were youth that did not engage in vegetable production, (66.7 %, n =106) said yes while (33.3 %, n = 53) said no. It was necessary to establish the reasons why some youth rarely engage in urban vegetable production.

Table 4.7: Reasons why some youth not participating in vegetable production

Reasons for not engaging	Frequency *	Percent
Negative perception towards farming	97	61.0
Insufficient financial resources	78	49.1
Inadequate support from extension officers	74	46.5
Inadequate land for farming	66	41.5
Inaccessible to farming knowledge	61	38.4
Inadequate support from the parents and siblings	36	22.6
Little time available for farming	27	17.0

Source: Field Survey (2014), *Multiple responses hence the total does not add to 100%)

From Table 4.7, about 6 in every 10 (61.0 %, n = 97) youth that engage in vegetable production believed that some youth had a negative attitude towards farming whereas about 2 in every 10 youth (17.0 %, n = 27) noted little time available for farming. When the youth develop negative perceptions and beliefs was further established through interviews. The attitude and perception of an individual about a particular behaviour (participation in vegetable production) to some extent influences them to perform that particular behaviour (engage in production practices). The Theory of Planned Behaviour as argued by Ajzen (1991) manifested in the way youth's attitudes and perceptions (negative) influenced their involvement in urban vegetable production.

4.3.10 Reasons for participation in other economic activities

Most urban dwellers engage in more than one livelihood activity to promote sustainability of livelihoods. Other livelihood activities that youth engaged in alongside vegetable production included selling of groceries, saloon and barbershop, selling clothes, charcoal selling, motorcycle business (boda boda), selling fish and roasted maize, computer and money transfer services (M-pesa).

Urban vegetable production being a seasonal activity, gave the youth opportunities to venture into other economic activities. This could be attributed to the little time required to work on the small vegetable gardens. Youth stated that they engaged in other livelihood activities due to various reasons. More than half of the respondents (59.1 %, n = 94) engaged in other economic activities because it had higher and quick financial returns while a few (6.9 %, n = 11) due to job satisfaction (Table 4.8).

Table 4.8: Reasons for participation in other livelihood activities

Reasons for participation	Frequency*	Percent
Higher and quick returns	94	59.1
Interesting	38	23.9
Academic qualifications	23	14.5
Job satisfaction	11	6.9

Source: Field Survey (2014) *Multiple responses hence the total does not add to 100%)

This suggests that most of the respondents engaged in other livelihood strategies because of higher economic returns. According to the Theory of Planned Behaviour, individuals tend to perform a particular intention if they perceive it positively and in this case youth engaged in other livelihood activities because it had high economic returns. According to Sustainable Livelihood Approach urban dwellers engage in a multitude of economic activities to eke out their livelihood. This partly explains why some of the youth have diversified their livelihood strategies to reduce on vulnerabilities and enhance achievement of sustainable livelihoods (Meikle *et al.*, 2001; Scoones, 1998).

4.4 Access to resources for vegetable production

The objective number two was to assess the farming resources accessible to the youth participating in urban vegetable production and decision making. According to the Sustainable Livelihood Approach the access and control of livelihood assets promotes sustainability. The Theory of Planned Behaviour was critical in understanding the influence of access to farming resources accessible to youth engaging in urban vegetable production in Kakamega Town. Farming resources in this study include any material or service that is required for the effective farming to take place. The farming resources accessed by youth necessary for participation in farming were land, water, farm inputs, finances (credit), labour and extension services as discussed below.

4.4.1 Access to land

Access to land by the youth increases their participation in urban vegetable production. Ideally, land is not only useful for direct production of crops but also as collateral for securing financial capital from banks (Darkey *et al.*, 2014). Sustainability of urban farming is likely to be determined by the mode in which farmers gain access to land for farming. Secure tenure would facilitate continuous participation of youth in vegetable production in future. For instance, those youth who have either bought land or inherited it from their parents /relatives are likely to have secure land ownership rights compared to those that have borrowed or hired.

Table 4.9: How vegetable plots were acquired

How plot was acquired	Frequency	Percent (%)
Negotiation with county government officials	74	46.5
Borrowed from landlords/friends	36	22.6
Hired from neighbours/landlords	23	14.5
Inherited from parents/relatives	17	10.7
Bought	9	5.7
Total	159	100

Source: Field Survey (2014)

It was reported that some of the respondents (46.5 %, n = 74) said that they had negotiated for land with the County Government officials in Kakamega Town and a few (5.7 %, n = 9) had bought (Table 4.9). Most vegetable gardens in Mundiri estate belonged to the County Government of Kakamega, in Amalemba the youth indicated that they had hired the land from neighbours and the landlords whereas in Matende most of the youth had inherited or bought the land. From the field observations, most of the vegetable plots were located at the backyard while others were at the front yard of the house.

The above results agrees with the findings of Simiyu in Eldoret (Kenya), Kiguli and others in Kampala (Uganda) and Obuobie and others in Accra (Ghana) where urban farmers acquire land through negotiation with city authorities, hiring, borrowing, inheritance from parents and/or spouse as well as buying (Kiguli *et al.*, 2003; Obuobie *et al.*, 2003; Simiyu, 2012; Quansah, 2012). However, some landlords within Kakamega town did not ask for land rent directly from the tenants as indicated in interview. A female farmer from Amalemba Estate said:

“The landlord has allowed us to cultivate on the plot near the house. He said that because we pay the house rent we could cultivate vegetables, maize and anything we would like within the plot.” (Interview, 13 June 2014)

The above finding is similar to that of Asiama in Freetown (Sierra Leone) where urban farmers rarely pay rent for land use and are allowed to cultivate any type of crop they want (Asiama, 2005).

Although vegetable production requires little space for cultivation, the size of the plot has a direct bearing on the quantity of vegetable produced. It is expected that the larger the farm the more the vegetables that would be produced whereas the smaller the farm the lesser the quantity produced. It was revealed that, the mean size of the vegetable plots was 24.76 square metres (m²) and the standard deviation was 3.55 square metres (m²). The distribution of plot in terms of mean size was such that in Matende estate the size was 25.1 square metres (m²), followed by Mundiri estate with 25.0 square metres (m²) whereas in Amalemba it was 23.2 square metres (m²). Since Matende Estate was located farthest from the Central Business District (CBD) it was expected to be less crowded with commercial buildings compared to the other two estates.

It was essential to establish whether the current land that was accessible to respondents was adequate for the vegetable production. It was revealed that two thirds of the youth (66.7 % n = 106) said that the land was inadequate whereas one third (33.3 %, n = 53) said it was adequate. This finding is similar to that reported by Kiguli *et al.*, (2003) and Namwata, *et al.*, (2015) whereby about 60 % of the urban farmers in Kampala in Uganda and 59.7 % in Dodoma Municipality in Tanzania were seeking for more land to expand their acreage of production.

Some respondents through interviews said that the current farm for vegetable production was inadequate because the plots were also used to cultivate other crops like maize, bananas and sugarcane. A male farmer from Mundiri estate when asked about the adequacy of his plot for vegetable production said: “*the current vegetable plot is too small. I plan to obtain more land to expand my production*” (**Interviewed, 14 June 2014**)

It was important to establish whether access to land influenced the respondents to start engaging in vegetable production. More than half of the respondents (52.8 %, n = 84) strongly agree with the view that access to land influenced them to start vegetable production whereas a few youth (14.5 %, n = 23) were not sure as shown in Table 4.10.

Table 4.10: Influence of access to land on youth participation

Level of Agreement	Frequency (N = 159)	Percent (%)	Total score
Strongly Agree	84	52.8	252
Agree	52	32.7	104
Unsure	23	14.5	23
Total	159	100.0	379 (2.38)

Source: Field Survey (2014)

It was established that access to land was one of the critical factors influencing youth to participate in vegetable production in Kakamega Town.

4.4.2 Access to water

Access to water promotes continuous production of vegetables throughout the year with minimal disruptions during dry seasons. For sustainable production of vegetables throughout the year, irrigation during the dry season is necessary. It was revealed that in the study area about eight in every ten youth (79.9 %, n = 127) were irrigating their vegetable farms during the dry season whereas two in every ten youth (20.1 %, n = 32) rarely irrigated their vegetable farms. The findings contradicts that of Foeken & Owour (2000) who in their studies in Nakuru (Kenya), found out that about fifty percent (50%) of the farmers were irrigating their crops. This could be attributed to differences in accessibility to water as well as the control by local authorities between the two towns.

Most of the respondents who were accessible to water irrigated their vegetables in the study area during the months of November and February. Irrigation of vegetables was mainly done early in the morning or late in the evening when the evaporation rate was believed to be low which is similar to other towns like Eldoret (Kenya) and Accra (Ghana) (Obuobie *et al.*, 2006; Simiyu, 2012). Some of the reasons for differences in irrigation of vegetables were captured through interviews that were conducted in the

study area. A male farmer from Mundiri Estate while commenting on irrigation of vegetables said:

“...I do not irrigate vegetables frequently throughout the year because there is plenty of rain water in this area. But during the dry spell I do irrigate in the morning or evening depending on the temperatures during the day.” (Interview, 12 June 2014)

In another interview, a female farmer from Amalemba estate said: *“I cultivate vegetables mainly during the rainy season. During the dry season, vegetable production is limited by inadequate water for irrigation.”(Interview, 14 June 2014).*

Urban farmers obtain water for irrigation from various sources. About three in every five youth (61.6%, n = 98) obtained water from water kiosks whereas only (2.5 %, n = 4) of the youth got water from the boreholes (Table 4.11).

Table 4.11: Sources of water for irrigation

Sources of water for irrigation	Frequency *	Percent (%)
Water kiosks	98	61.6
Piped water	54	34.0
Recycled waste water	31	19.5
River/Streams	23	14.5
Borehole	4	2.5

Source: Field survey (2014) *Multiple responses hence the total does not add to 100%)

A large number of the youth in Mundiri estate were accessible to piped water and boreholes and therefore expected to irrigate their vegetable farms since the water taps were located a walking distance from the vegetable farm. In Amalemba estate, most of the respondents relied on water from kiosks and recycled water for irrigation. In Matende estate, the respondents relied on water from the streams which was about 200 M away from the study area and recycled water to irrigate their vegetable gardens. The source of water for vegetable irrigation in Kakamega Town was further established through interviews. A female farmer from Amalemba estate said: *“the*

main source of water is the water kiosk which is about 200m away from my farm. I also use waste water from the kitchen to irrigate vegetables.” (Interview, 14 June 2014)

During irrigation of vegetables water buckets and 10 litre jerricans were used to carry water from the main water source to the vegetable farm which is similar to other towns in Africa like Accra in Ghana (Obuobie *et al.*, 2006). However, in cities found in Burkina Faso urban farmers use watering cans, motor pumps and reservoirs for irrigation (Kinane *et al.*, 2003).

It is presumed that access to water has some influence on production of vegetables. The youth that engage in vegetable cultivation in Kakamega Town were influenced as shown in Table 4.12. A large percentage of the respondents noted that access to water promoted continuous vegetable production throughout the year (3.29) while a few noted that it contributed to soil pollution (1.97) (Table 4.14). Namwata *et al.*, (2015) argue that since vegetables are not drought resistant, water is critical for vegetable production during dry seasons for better quality and higher yields.

Table 4.12: How access to water influences vegetable production

Influence	SA	A	D	SD	Total (Mean)
Increased yields	52	57	31	19	460 (2.89)
Promotes continuous production	76	61	14	8	523 (3.29)
Leads to soil erosion	21	28	87	23	365 (2.30)
Contributes to soil pollution	13	11	93	42	313 (1.97)

Source: Field survey (2014) *Multiple responses hence the total does not add to 100%)

4.4.3 Access to farm inputs

Farm inputs in this study include vegetable seeds, fertilizer as well as agro-chemicals which are accessed by the youth. It was revealed that the youth obtained farm inputs through borrowing from friends, buying and exchange with other goods. The sources of farm inputs that youth were accessible to are as shown in Table 4.13.

Table 4.13: Main source of farm inputs

Main source	Frequency*	Percent (%)
Own farm	132	83.0
Buying	107	67.3
Borrowing	78	49.1
Exchange with other goods	26	16.4

Source: Field Survey (2014) *Multiple responses hence the total does not add to 100%)

Majority of the youth (83.0 %, n = 132) obtained the farm inputs such as seedlings and manure from their own farms while a few of the youth (16.4 %, n = 26) exchanged for inputs with vegetables harvested. It was revealed through interview that some youth were recycling seeds (seedlings), others used organic manure from their farms and other youth borrowed organic manure from their neighbours and friends. Agro-chemicals were the most commonly bought farm inputs compared to either seeds (seedlings) or organic manure.

4.4.4 Access to finances

Financial assets are critical for the acquisition of farm inputs, buying or hiring land and seeking of extension services by the farmers. Youth participating in vegetable production sourced for money from various sources.

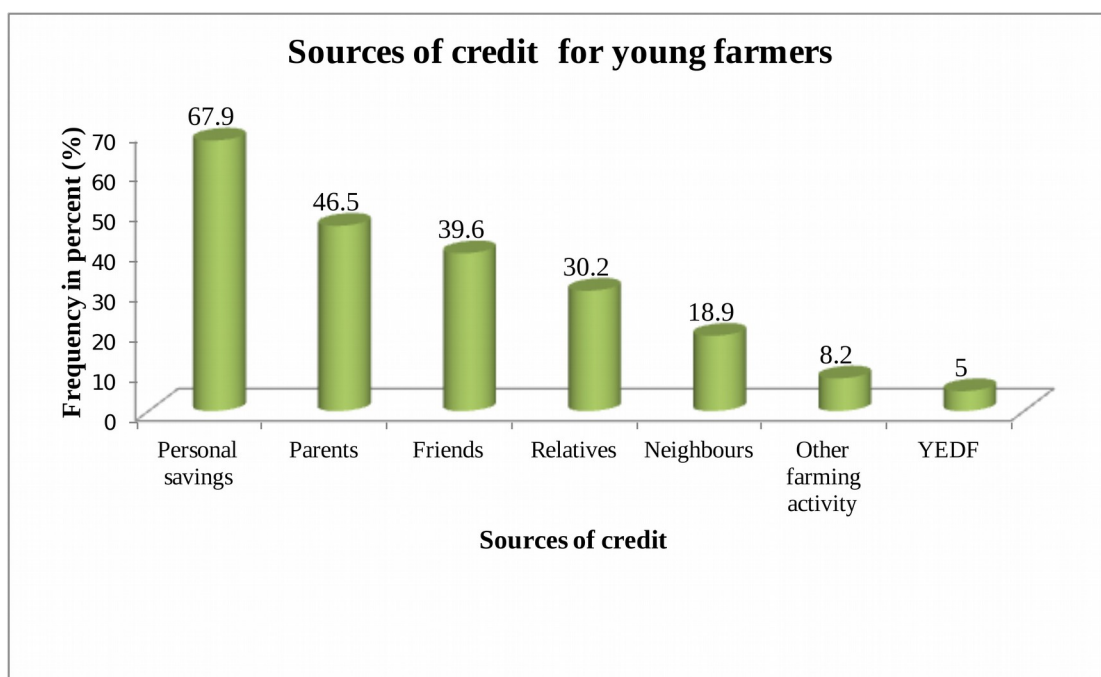


Figure 4.4: Sources of financial resources (credit) *Multiple responses hence the total does not add to 100% Source: Field Survey (2014)

More than two thirds of the respondents (67.9 %, n = 108) obtained finances from personal savings whereas only (5.0 %, n = 8) from the Youth Enterprise Development Fund (YEDF) (Figure 4.4). This implied that most of the youth commonly obtained credit from informal institutions for vegetable production. This could be attributed to the low capital investment required to establish a vegetable farm. Furthermore they rarely obtain finances from financial institutions because most youth do not belong to groups that could enable them secure YEDF or Banks.

4.4.5 Access to labour

The youth engaging in urban vegetable production due to limited time might require labour. The source of labour could be hired or family based. Since most youth have little sources of income they are likely to rely more on family labour. More than a quarter of the respondents (27.7 %, n = 44) indicated that other sources of labour included parents whereas only two respondents (1.3 %, n = 2) hired labour (Table 4.14).

Table 4.14: Source of labour for vegetable farming

Other sources of labour	Frequency *	Percent
Parents	44	27.7
Siblings	26	16.4
Spouse	17	10.7
Relatives	11	6.9
Friends	8	5.0
Children	6	3.8
Hired labour	2	1.3

Source: Field Survey (2014) *Multiple responses hence the total does not add to 100%)

This implies that parents cultivated vegetables alongside their children therefore transfer of farming skills and knowledge was possible from one generation to the next. It could be concluded that there is intergenerational sustainability of urban vegetable production (See, Chambers & Conway, 1999).

Furthermore, it could be noted that there was division of labour between male and female youth and household task distribution among siblings. There was also hiring of casual labourers to work on the vegetable farms while some relied on the labour from their relatives and friends. Most married youth were supported by their spouses through land preparation and weeding of the vegetable garden.

4.4.6 Access to extension services

The accessibility to extension services is critical for enhancing knowledge and skills required for production. The training of the youth who were receptive to new knowledge is important for the effective production of vegetables in urban areas such as Kakamega Town. Some of the respondents noted that they sought extension services while others did not. It was established that (27.7 %, n = 44) of the youth sought extension services while (72.3 %, n=115) were not. This implied that the majority of the respondents did not seek farming knowledge.

It was important to establish where extension services were sought from as shown in Figure 4.5. Some of the respondents (16.4 %, n = 26) obtained extension services from agricultural shows whereas only three respondents (1.9 %, n = 3) got extension services from the agricultural desk at Bukhungu Chief's office and the demonstration farms (Figure 4.5). Agricultural show is commonly organized by Agricultural Society of Kenya (ASK) annually in collaboration with the Ministry of Agriculture and other stakeholders. During the agricultural shows varieties of vegetables were displayed and some handbooks given to the young people for reference.

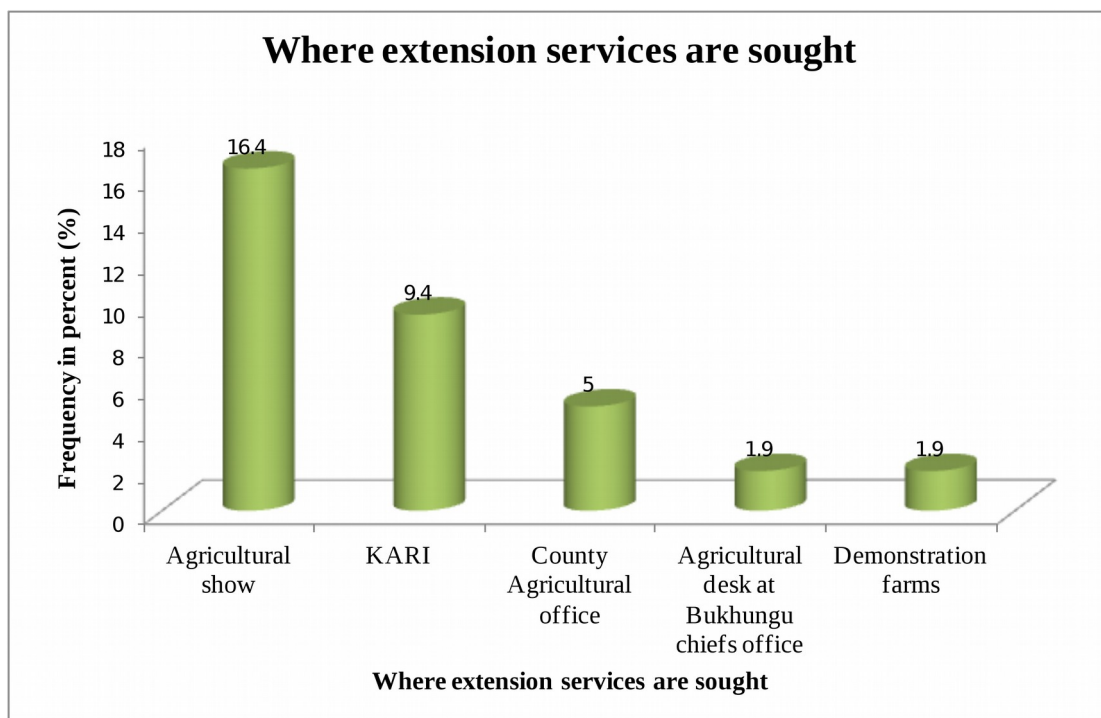


Figure 4.5: Where extension services were sought *Multiple responses hence the total does not add to 100% Source: Field Survey (2014)

An Agricultural Officer from Kakamega Agricultural office said the following when asked about provision of extension services to vegetable farmers:

“We have been educating the youth in almost every area of the town through seminars about vegetable production in their respective youth “bunges” in collaboration with United States AID (USAID). We were also advising them to carry out the vegetable planting and marketing.” (Interview, 21 June 2014)

It was important to find out the reasons why some of the youth did not seek extension services. They gave various responses as indicated in the Figure 4.6: About one half of the respondents (49.7%, n = 79) did not seek extension services because of inadequate time whereas only (15.1%, n = 24) said insufficient information (Figure 4.6). Since parents were providing farming information to their children (youth), some youth believed that there was no need to seek information from the agricultural offices.

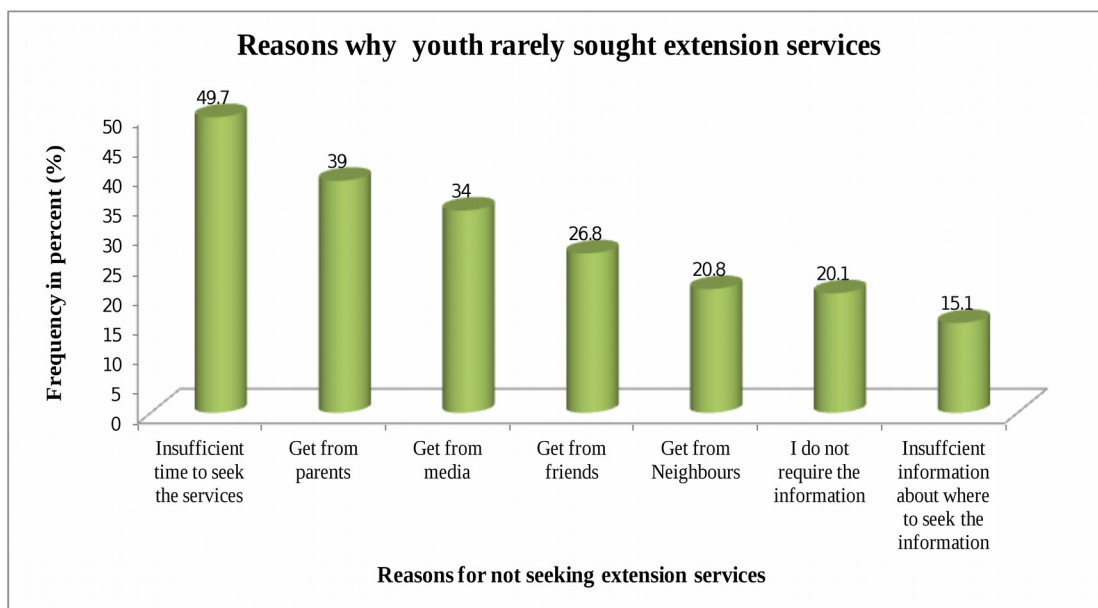


Figure 4.6: Reasons why youth do not seek extension *Multiple responses hence the total does not add to 100%) Source: Field Survey (2014)

Some of them noted that they had learnt agriculture in secondary schools while others were former members of 4-K clubs therefore they were using the knowledge and skills they had gained at school. Most of the women noted that they did not have enough time to visit Agricultural shows, the agricultural desk located near the Bukhungu Chief's office, KARI or the Town Agricultural offices although these offices were within the town.

Some women noted that their busy schedule (performing household duties and caring for the children) was quite demanding while others reported that they were occupied in their studies most of the time. Moreover, other vegetable farmers argued that they obtained information related to fertilizer, seeds or technologies from friends, neighbours or the mass media. The youth that use the mass media indicated that they watched television programmes like "Shamba Shape up" on Citizen or they searched for relevant agricultural information over the internet. This finding is similar to that of Auta *et al.*, (2010) who established that some of the youth farmers from the rural

areas in Nigeria got agricultural information from friends, neighbours, and mass media.

4.4.7 Decision making to use farming resources

Urban households in the process of diversifying their livelihoods are likely to be influenced by power relations based on gender and household headship. The youth that engage in urban vegetable production are likely to be influenced by their parents, relatives, friends, neighbours, spouses among others.

It was imperative to investigate the individuals and stakeholders that influenced youth to begin engaging in urban vegetable production in Kakamega Town. More than three quarters of youth (77.4 %, n =123) were influenced by parents and older siblings whereas only eight respondents (5.0 %, n = 8) were influenced by extension officers (Table 4.15). This implies that parents (especially mothers) and older siblings in Kakamega Town play a critical role in determining whether their children would be future farmers or not and therefore transfer of skills and knowledge from one generation to another (intergeneration sustainability).

Table 4.15: Individuals and stakeholders supporting youth participation

Who influenced the youth	Frequency *	Percent
Parents and older siblings	123	77.4
Relatives	22	13.8
Friends	17	10.7
Neighbours	14	8.8
Mass media	11	6.9
Extension officers	8	5.0

Source: Field Survey (2014) *Multiple responses

A male farmer from Matende, when asked who influenced him to start vegetable production, he said: *“I began cultivating vegetables after high School and I was*

encouraged by my mother through the benefits she used to gets from the vegetables.”

(Interview, 16 June 2014)

It was revealed through interviews that some youth grew the vegetables that were common in the region and marketable. Furthermore, other youth were influenced by their parents and spouses. For instance a female farmer from Mundiri estate stated that:

“When I first came to Kakamega Town in 2011 most of my neighbours used to grow kales, cowpeas, Amaranthus species, and Black night shade. I first obtained the suckers from my neighbours for kales and bought seeds for other vegetables from the agro-veterinary shop. Since my husband works in Eldoret and he is absent most of the time, I do not consult him on the type of vegetables to grow and how i use the vegetables.” **(Interview, 12 June 2014)**

Some male youth engaged in vegetable production because of some influence from their parents.

A male farmer from Mundiri estate stated that:

“....Since my mother likes vegetable production, she normally gives me the seeds to plant on my own plot. Although I do most of the farming my mother is the one that does the harvesting. When the vegetable yields are high, she sells some to the women grocers. Sometimes she gives me Ksh 200 when she gets more profits. But in most cases, I do not get anything in terms of money. I rarely demand to share the money with her.” **(Interview, 12 June 2014)**

4.5 Benefit of vegetable production to livelihood

Objective number three of the study was to establish the benefit of vegetable production towards improvement of livelihoods in Kakamega Town. The youth that were engaging in vegetable production were better placed economically, politically and socially due to the opportunities vegetable production presented to them.

Sustainable Livelihood Approach advocates for both intergenerational and intragenerational sustainability of livelihoods.

4.5.1 Benefit on food supply

Food supply was one of the main reasons why the respondents were engaging in urban vegetable production. Generally, the price of vegetables in urban centres is quite expensive and therefore urban vegetable production could promote access to vegetables. This was critical in the achievement of the Sustainable Development Goal number one and two that targets to reduce poverty in all forms and end hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030 (UNDP, 2016). It was necessary to establish whether the production of vegetables within Kakamega Town was adequate for food. The respondents were asked to state the level of adequacy of the contribution of vegetable to food supply to the family.

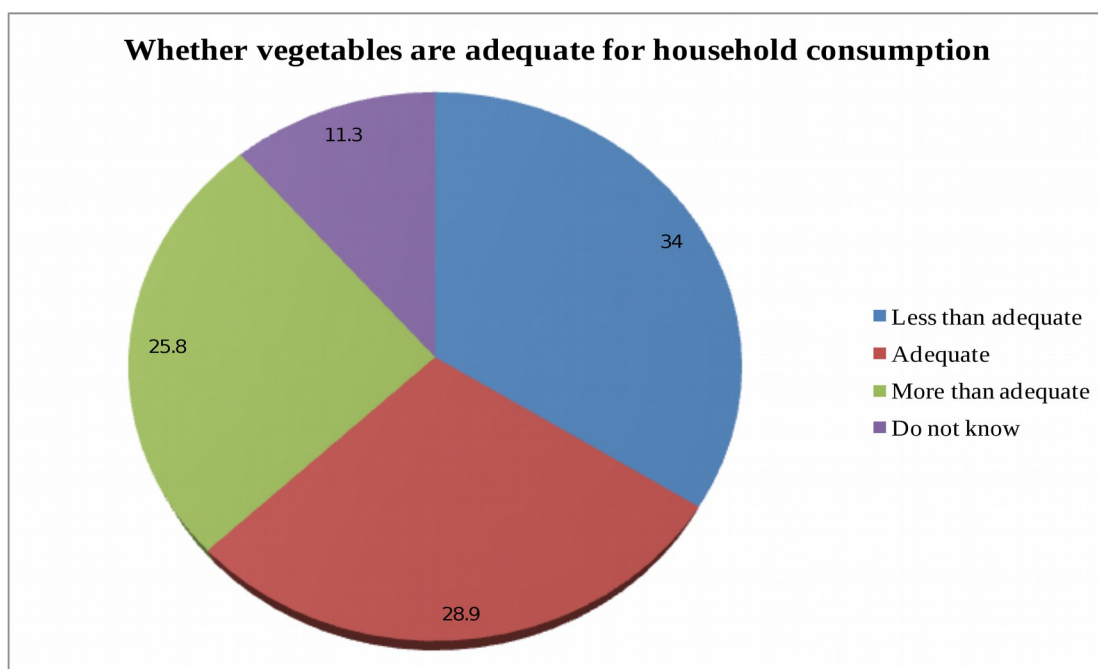


Figure 4.7: Adequacy of vegetables for food. Source: Field Survey (2014)

More than a third of the 159 youth vegetable farmers (34.0 %, n = 54) indicated that vegetable production was less than adequate; some (28.9 %, n = 46) said it was adequate, others (25.8 %, n = 41) noted that it was more than adequate for food and a few (11.3 %, n = 18) said they did not know (Figure 4.7). This implies that more than half of the vegetable farmers noted that the current production of vegetables was adequate and more than adequate for family use.

It was imperative to establish where the youth obtained vegetables during off-peak because some of the respondents cultivated the vegetables during the rainy season. More than eight in every ten youth vegetables farmers (84.3 %, n = 134) obtain vegetables from estate kiosks, compared to only eight youth (5.0 %, n = 8) from their rural home (Table 4.16).

Table 4.16: Where respondents obtained vegetables during off peak season

Where vegetables were obtained	Frequency*	Percent
Estate kiosks	134	84.3
Town Market	47	29.6
Neighbours	23	14.5
Friends	11	6.9
Rural home	8	5.0

Source: Field Survey (2014) *Multiple responses hence the total does not add to 100%)

A majority of the youth obtained vegetables from estate kiosks operated by “*mama mboga*” (Kiswahili word for female grocers) because the kiosks are located nearby. Moreover, some urban dwellers had rural-urban ties especially in terms of obtaining vegetables during the off-peak seasons.

4.5.2 Benefit on food expenses

It was critical to establish the amount of money spent on green vegetables on a daily basis to describe how urban vegetable production was important in improvement of livelihoods. The respondents were asked to state the amount of money they spend on

green vegetables per day. About three in every ten youth (29.6 %, n = 47) revealed that they spent between Ksh 30 and 40 per meal whereas only five youth (3.1 %, n = 5) spent more than Ksh 50 between the month of November and February when the area receives amount of rain hence had obtain the vegetables from other source (Table 4.17).

Table 4.17: Money spent on green vegetables per meal during off-peak season

Amount of money (Ksh)	Frequency (N = 159)	Percent
< 10	28	17.6
10 – 20	39	24.5
20 – 30	26	16.4
30 – 40	47	29.6
40 – 50	14	8.8
>50	5	3.1
Total	159	100.0

Source: Field Survey (2014)

The mean expenditure on vegetables was Ksh 25 with the standard deviation of Ksh 3. It could be argued that the expenditure on food was saved during the peak season. Furthermore, the money that could otherwise be used to buy green vegetables was used to cater for other basic needs within the household or an individual. Therefore, vegetable production had income benefit by saving the household's or individual' total expenditure on foodstuffs.

4.5.3 Benefit on income generation

It was noted that vegetables were sold by women mainly during the peak season (between June and August) when a wet season is experienced in the study area. This was mainly done at the farm gate where the vegetables were sold to neighbours or “*mama mboga*” (female grocers). Some of the grocers packed the vegetables in sacks and carried it by their heads while others used motor bike or bicycle to their vegetable

stalls. The vegetables were later sold to customers some walking distance away from the estates or within the Town. Some youth in Kakamega town obtained money from the vegetable production as sellers or transporters of the vegetables. The respondents from Mundiri Estates were selling their vegetables more than in the other estates (Matende and Amalemba).

The study established that the mean income obtained from vegetable sales was Ksh 270 while the standard deviation was Ksh. 5.

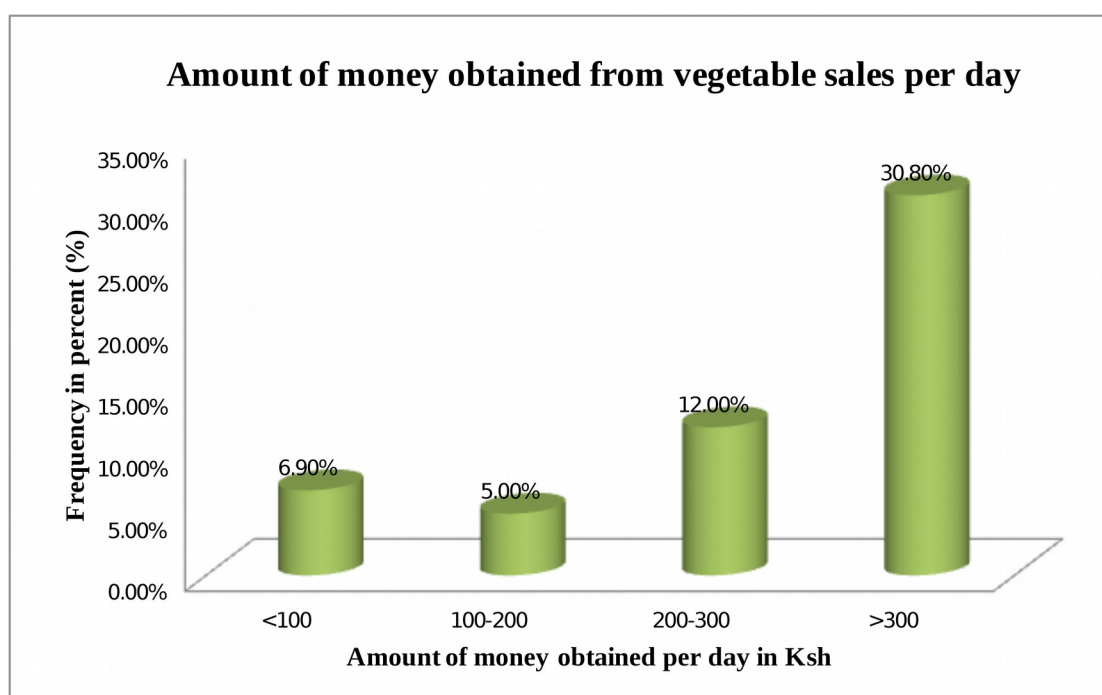


Figure 4.8: Income obtained from vegetable sales. *Multiple responses hence the total does not add to 100%) Source: Field Survey (2014)

About three in every ten respondents (30.8 %, n = 49) indicated that they obtained more than Ksh 300, some (12 %, n = 19) of the youth said they earned between Ksh 200 and Ksh 300, others (5.0 %, n = 8) reported that they obtained between Ksh 100 and Ksh 200 whereas a few youth (6.9 %, n = 11) obtained less than Ksh 100 per day (Figure 4.8). The money obtained was important in supplementing the other sources of income for the youth.

4.5.4 Uses of income from vegetable sales

The profits accrued from the vegetable sales were used to supplement the income earned from other livelihood strategies. This income was used in various ways at the individual level or household level. Some of the respondents (47.8 %, n = 76) used the money to cater for family expenditure whereas a few youth (13.8 %, n = 22) used the money to pay for group membership subscription (Table 4.18).

Table 4.18: Uses of the money obtained from vegetable sales

Use of money obtained from vegetable sales	Frequency *	Percent
Family use	76	47.8
Investment in vegetable production	41	25.8
Payment of social functions and celebrations	38	23.9
Save for future use	27	17.0
Payment of group membership subscription	22	13.8

Source: Field Survey (2014), *Multiple responses hence the total does not add to 100%)

Most of the money was used to cater for other household expenditures like acquiring other food items, household goods and catering for educational needs. This implies that some of the income obtained benefited the household through family use while the individuals benefitted through saving for future use and paying their group membership subscription.

4.5.5 Benefit on social activities

Youth involvement in social and political activities such as membership groups, associations and political parties is important for achievement of sustainable livelihood. Most women participated in church-based and neighbourhood-based organizations. The data was obtained by use of interview schedule since most of the farmers during the survey indicated that they did not belong to any group or association. However, a few of those that were members of organizations or

associations were interviewed. One of the women farmers from Matende estate when asked how the organization she belongs to operates revealed:

“...I am the secretary of a church-based organization. We meet every Sunday afternoon to deliberate on the social and financial problems facing women in this area. Every month we are required to pay a monthly subscription of Ksh 500. However, during social functions like weddings, burial and “harambee” we contribute a flat rate of Ksh 200. I mainly use the money from vegetable sales and sometimes borrow from my husband to cater for this.” (Interview, 16 June 2014)

The above narration implies that some women farmers used the income from vegetable sales to pay for the organizations they belonged to. Hence, vegetable production is beneficial to the women farmers by enabling them to participate in social or association activities. Therefore, vegetable production had had social benefit to some (female) of the farmers.

Some male farmers revealed through interviews that they belong to “youth bungenes” (bunge is a Kiswahili word for parliament) where they discuss mainly political events and rarely social issues.

This is supported by the story of one of the male farmer from Amalemba estate below:

“...I am a member of a “Youth Bunge” where we meet every Saturday to discuss political leadership in Bukhungu Ward. We want our voices to be heard by the local politicians. Sometimes we discuss projects that can enable us make money like small livestock keeping, tree planting and brick making.” **(Interview, 17 June 2014)**

This indicates that male farmers were active participants in political discussions. Moreover, other important projects that can increase the earnings of the youth and how they can diversify their livelihood strategies are discussed. Therefore, participation in vegetable production enabled the young men to discuss other ways of getting more money to improve their livelihood.

4.5.6 Benefit on the environment

Generally, urban vegetable production contributes to greening of the city. It is argued that greening of the city makes it have a good aesthetic value. All the farmers (100%, n = 159) revealed that vegetable production contributes to the beauty of Kakamega Town. This implies that vegetable production benefit the environment.

However, through interviews, it was revealed that most of the farmers were concerned about the application of inorganic fertilizers to enhance soil fertility and spraying of insecticides and fungicides to control pests and diseases. A male farmer from Amalemba estate said:

“...I mainly use organic fertilizers to supplement the depleting soil nutrients. I rarely use insecticides or fungicides but normally apply wood ash or uproot the affected plant and burn to control the spread of pests and diseases. During vegetable irrigation, I usually apply sufficient amount of water to reduce on soil erosion. The vegetables grown in urban areas as compared to rural areas will have some pollutants but nowadays every food grown in the soil is contaminated due to pollution” **(Interview, 18 June 2014)**

The above revelation, points out that some of the vegetable farmers were aware of the negative effects of the use of agro-chemicals and excessive water on the urban environment. Also, these farmers argued that soil contamination can occur both in urban as well as rural areas.

Vegetable production was important to livelihood of the farmers. The farmers were able to obtain fresh and stable supply green vegetables, saved on the food expenditure, secured some money from vegetable sales which was used to cater for social functions and their environment was greener. According to SLA framework livelihood outcomes could be virtuous or vicious. From the findings of the present study, it was established that the youth participating in vegetable production in Kakamega Town benefitted from these virtuous livelihood outcomes within their households.

4.6 Constraints to vegetable production and livelihoods

The fourth objective of this study was to establish the constraints to vegetable production and livelihoods of youth participating in vegetable production. The SLA theoretical framework argues that vulnerability could be manifested in terms of risks, shocks or challenges. In the present study, the vulnerability facing youth participating in vegetable production was also understood through the constraints limiting effective participation and improvement of their livelihoods. The Theory of Planned Behaviour was critical in understanding the influence of constraints to youth participation in vegetable production in Kakamega Town.

Vegetable production is hindered by various factors which lead to poor harvests and low profits. This reduces the benefit obtained from vegetable production and reduces the positive impacts on livelihood. Furthermore, the continuity of vegetable

production relies on ability to minimize the production challenges. It was revealed that most of the vegetable farmers (96.3 %, n = 153) were experiencing vegetable production challenges while a few (3.7 %, n = 6) were not experiencing any production constraints.

The constraints faced by the youth ranged from those that influence initial investment, knowledge and skills available and the quantity and quality of the vegetables produced. The major constraints that influenced the youth participation in urban vegetable production were as shown in Figure 4.9.

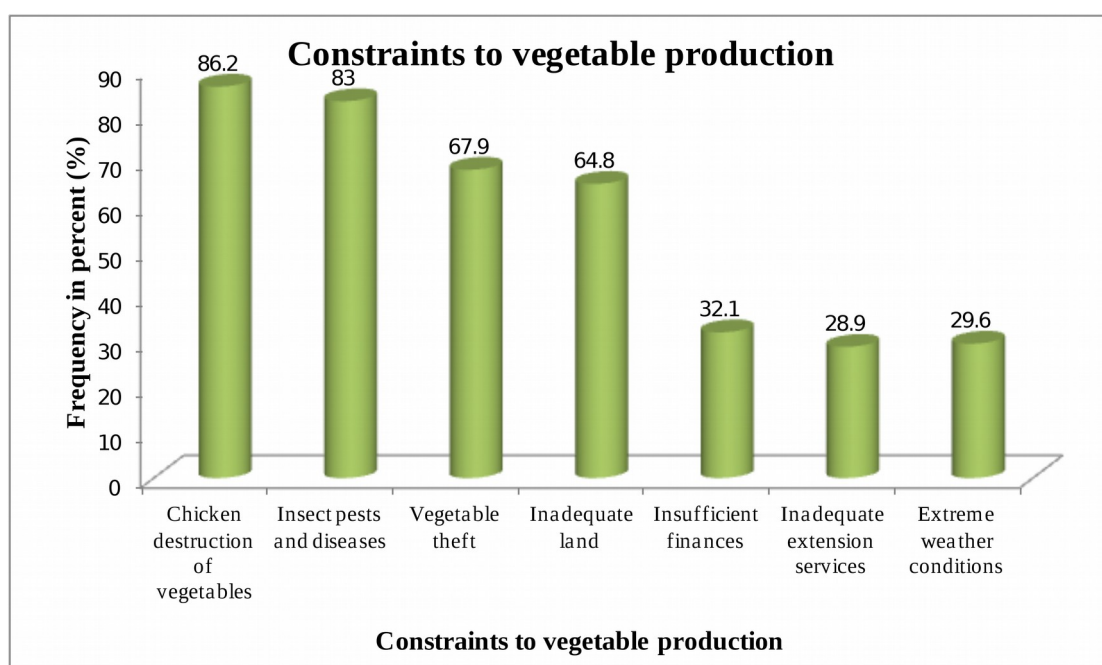


Figure 4.9: Major constraints experienced by respondents *Multiple responses hence the total does not add to 100%) Source: Field Survey (2014)

A large percentage of youth (86.2 %, n = 137) reported chicken destruction of vegetables whereas only nine (5.7 %) of the respondents indicated inadequate water during dry season as the main challenges facing them (Figure 4.9). These findings are similar to those by Ejersa (2011), Foeken (2013), Hungwe (2007), Jansen *et al.* (1996), Kintomo *et al.* (1997), Potutan *et al.* (1997) and Simiyu (2012) whereby the

destruction of crops grown by chicken in urban areas was one of the main constraints to urban farmers.

4.6.1 Chicken destruction of vegetables

Livestock such as chicken in Kakamega Town sometimes destroy vegetables on the farm. This is experienced when chicken is left to roam around and end up straying into the vegetable farms of the owners or those of the neighbours. Chicken usually destroyed the leaves while the goats consume the whole plant. These livestock can destroy vegetables of the owner as well as the neighbours. This implies that the neighbours owning chicken contribute greatly to the challenges related to destruction of crops. This leads to conflicts between the urban vegetable farmers and livestock keepers.

These conflicts can greatly influence the future participation of youth in vegetable production. Conflicts were resolved by the local administration and some farmers devised mechanisms to prevent the small livestock from invading the vegetable farms. The key informants were interviewed and made the following revelations: The Estate elder concerning the conflicts that arise between the chicken keepers and vegetable farmers said:

“...I normally hold meetings with the estate members where we discuss issues that affect residents after every two weeks. When a farmer reports vegetable destruction by chicken, I visit the vegetable farm and assess the nature of destruction by counting the stems of crops destroyed. I convene a meeting between the owner of the chicken and the aggrieved farmer where we discuss on the modality of compensating the affected farmer depending on the scale of destruction. Then I advise the neighbours to restrain their chicken in future.” (Interview, 12 June 2014)

This implies that the local administration plays a critical role in reducing the level of destruction and solving conflicts that arise between the vegetable farmers and chicken keepers.

Some youth have devised mechanisms to protect their vegetables from destruction such as use of old mosquito nets to control chicken from straying into their vegetable farms. When a female farmer from Matende Estate was asked why she had used old mosquito nets on her farm she noted that:

“.....My neighbours are very uncooperative. They allow their chicken roam around and in the event enter my vegetable garden....My immediate neighbours brew chang’aa and most of the time they are drunk and if I approach them they abuse me. To avoid the constant abuse I prefer to enclose my vegetable garden using old mosquito nets because chicken wire is too expensive and old rusty iron sheets are unavailable and the farm is so small.” (Interview, 13 June 2014)

From the narrative above some of the farmers argued that old mosquito nets are effective in reducing the chicken destruction of vegetables as shown in Plate 2 below.



Plate 2: Use of mosquito net to prevent chicken from invading the vegetable farm

Source: Field Survey (2014)

This implies that youth are innovative and risk takers when it came to control chicken destruction of vegetables on their farms. The photograph below was taken from the

farm of the female farmer from Matende estate after she gave consent to take it but not reveal her identities.

4.6.2 Insect pests and diseases

Some of the farmers revealed that pests such as aphids, army worms and caterpillars usually destroy the leafy parts of the vegetable plant and diseases like rust and blight affects the vegetative parts. This reduces the quality and quantity of the vegetable harvested. The farmers controlled pests and diseases through the use of agrochemicals and wood ash. These agrochemicals were mainly bought from the agro-veterinary shops while ash was obtained from the firewood ash. The use of wood ash and agrochemicals were commonly applied by the women because most of the female farmers offered most of the labour.

When the agricultural officer was asked about ways of controlling pests and diseases he said that:

“.....most vegetable farmers control insect pests by spraying with insecticides. However, a plant called Mexican Marigold is planted around the vegetable garden which has a smell that keeps away insects therefore it could be used to control insect pests.”(Interview, 21 June 2014)

The *Mexican Marigold* is one of the plants that produce gaseous substances that act as a repellent to the insects. Most of the farmers were unaware of the positive impacts of planting this plant around their vegetable farms to control insect pests.

4.6.3 Vegetable theft

Some of the farmers indicated that theft as one of the hindrances to vegetable production. The vegetables were stolen at night when everyone is asleep or during the day when nobody is at home. In the study area, vegetable theft was more rampant in

Amalemba and Matende estates as compared to Mundiri Estate. Some of the farmers revealed that they had caught the vegetable thieves red-handed while others had never caught one. They expressed different ways in which they had handled the vegetable thief for those who had caught one. Many of them said that they reported vegetable theft cases to local administration (the Estate elder, assistant chief, the chief or the police), others warned the culprit while a few reported to the parents of the culprits. The revelation below points out that the estate elder played a vital role of administration in solving vegetable theft cases:

“.....In January 2014 a theft case was reported to me by a vegetable farmer from Amalemba where a culprit had been caught red-handed. The aggrieved farmer demanded to be paid Ksh 3000 by the culprit immediately. I assessed the damages and we agreed that the vegetable farmer would be compensated Ksh 1500 by the defendant. In cases where the thief is not caught red handed and vegetables are stolen, then I normally evaluate the amount of vegetables lost in monetary terms and report the case to the Assistant chief. The assistant chief forwards the case to the chief who later informs the Ministry of Agriculture officials. Eventually, the affected farmers are compensated by the Ministry of Agriculture” (Interview, 12 June 2014)

It could be deduced from the interview above that the local administration and Ministry of Agriculture (institutions) helped in solving cases of vegetable theft and provision of compensation for the vegetable produce lost in Kakamega Town.

4.6.4 Inadequate land

Although all the respondents in this study were accessible to land, some of them noted that it was inadequate for vegetable production due to competition from other crops and commercial activities. Land accessibility in urban areas is hampered by the high commoditization of the land and completion from other lucrative enterprises. In cases

where land is available, most of the youth do not have control over the use of and decisions pertaining to the crops to be cultivated on the farms (Obuobie *et al.*, 2003).

The youth being innovative and risk takers, had devised various ways of solving the challenge. Majority of the youth (27.0%, n = 43) said that they hired, some youth (17.0%, n =27) noted that they borrowed and others (13.2%, n = 21) used mobile gardens for vegetable production. Most of the youth that experienced inadequate land (64.8%) used more than one way to access to more land which explain why the total does not add up to 100%. This finding is similar to those by Kiguli *et al.* (2003) who noted that the urban farmers in Kampala (Uganda) with limited access to land planned to secure funds to buy and others borrow from their kin or government. When a female farmer from Amalemba estate was asked about why she used mobile gardens, she had this to say:

“... Since my current farm is small, I use mobile gardens. I learnt about mobile gardens from the Agricultural show. I use sacks bought from the market to make the mobile gardens” (Interview, 11 June 2014)

Although some respondents cultivated vegetables on mobile gardens, they were very few within Kakamega Town. This could be attributed to the availability of adequate land for urban vegetable production within the town (See Simiyu, 2012). However some farmers observed that the use of mobile gardens would not increase their production as indicated in the interview below.

In an interview with a female farmer from Mundiri Estate on why she does not use mobile gardens revealed that:

“Although my current plot is small, I do not use mobile gardens. This is because the mobile gardens would not allow large scale vegetable production.” (Interview, 13 June 2014)

4.6.5 Inadequate finances

Insufficient finance (32.1%) was one of the challenges to vegetable production in Kakamega Town. The finances were required for acquisition of farm inputs such as seeds (seedlings), fertilizer, buying or hiring of land and buying the materials required for mobile gardens, paying farm workers and acquisition of extension information by either travelling or accessing the internet. This finding contradicts those of *Auta et al.* (2010) when they reported that most of the youth (78.7%) that engage in agriculture were inaccessible to financial capital and this decreases their level of farming in Nigeria. This could be due to the differences in the type of farming that youth were engaged in these two areas.

4.6.6 Inadequate extension services

Some of the farmers (28.9%) said that they experienced inadequate extension services. The farmers revealed various reasons why they rarely sought extension services. This had been discussed in details section 4.4 of chapter 4 (see Section 4.4.6).

4.6.7 Extreme weather conditions

During the month of April and May in Kakamega Town and its environs high amount of rainfall is received accompanied by hailstones which destroys the vegetable leaves. This reduces the quality of leaves especially vegetables such as cow-peas that were highly affected by hailstones. In Kakamega Town, it was reported that water was inadequate for vegetable production between the month of December and February when the area receives low amount of rainfall while the temperatures were relatively high.

According to the Agricultural officer in an interview during the Kakamega Agricultural Show in June 2014 it was revealed that there has been development of a

variety of vegetable seeds that were favoured by these weather conditions in Kakamega area. The seeds have been developed by KARI located about 1.5 Km from the study area.

4.6.8 Constraints towards improvement of livelihood

The high rate of urbanization experienced in Kakamega Town has had a considerable effect on the social, environmental, economic and political context of the youth. Kakamega town is one of the fastest growing towns in Kenya with an estimated population of about 120,000 by 2012 (Atieno, 2013). This increase in population has led to high demand for housing, water and sanitation facilities. Although some of the workers within Kakamega Town live in the suburban areas of the town, this has not reduced the pressure.

The high population increase has led to development of unplanned settlement areas within almost every part of Kakamega Town such as Kaburini, Masingo, Amalemba Scheme, Kisumu Ndogo and Shikhambi. Furthermore, people residing in these unplanned settlements experience poor drainage few sanitation facilities, inadequate tap water and the houses are made from temporary materials. In Amalemba and Matende estates, some of houses are built of mud and rusty iron sheets while the floors are dusty. Furthermore, electricity and garbage collection which are essentials for adequate housing are lacking in these areas.

Urban poverty in Kakamega Town has been on the upturn. A small proportion of the youth in Kakamega Town are permanently employed as established in demographics section. Most of the youth are either self-employed or casual workers. This predisposes them to food insecurity, harassment by local authorities and poor living conditions. Since, most of the youth were not engaged in formal employment the

living standards was generally low as it was revealed by some of the youth in Kakamega Town.

A female farmer from Amalemba estate revealed that:

“.....I was brought up by my grandmother within Kakamega Town since my mother and father passed away when I was still a child. I dropped out of secondary school in form three in 2009. Furthermore my grandmother is now old and sick hence I cannot depend on her any more. Since I do not have a reliable source of income, I am forced to seek jobs such as washing clothes. I also operate my vegetable kiosks and cultivate vegetables on the farm that we have borrowed from our land lord. In the evening, I am supposed to take care of my grandmother and perform other household chores. Although, I am facing economic challenges I have to survive. When I meet some of my former classmates, they usually remind me to go back to school.” **(Interview, 13 June 2014)**

From above quotation, although some of the youth participating in urban farming were facing economic challenges they had to fend for their families. Some of the women were vulnerable due to being single parents and therefore had to take care of their children alone.

Political participation involves engagement of individuals in political campaigns, voting for political leaders as well as expressing their political opinions. Some of the male youth who participated in the previous election process in Kakamega Town revealed that they experienced some challenges as one youth revealed.

A male farmer from Matende estate said:

“.....I was a campaigner of the ward representative vying on the Orange Democratic Movement (ODM) party ticket in the 2013 general elections within Bukhungu Ward, Kakamega Town. In the run up to these elections, one supporter of United Democratic Forum (UDF) party exchanged blows with a supporter of ODM which led to one of them breaking his hand in the process.” **(Interview, 16 June 2014)**

From the above discussions, youth in Kakamega Town were exposed to risks related to poor housing, inadequate sanitation facilities and high cost of housing, poverty and local politics.

4.6.9 County government policies on urban farming

Some studies have noted that the town policies play a critical role in determining access to key resources like land and water as well as the utilization of the resources (Namwata *et al.*, 2015; Simiyu, 2012). However, in this study it was established that restrictive policy was not a hindrance to youth participation in vegetable production. However, some of the by-laws enacted out-law cultivation of crops that grew to more than half a metre (knee-high) and were bushy like maize and bananas. The estate elder said the following when asked about the by-laws:

“Initially before the County Government of Kakamega came into place, the Town Council officers used to slash vegetables cultivated within Kakamega Town. But nowadays the County Government of Kakamega is allowing vegetable cultivation within the town.” (Interview, 12 June 2014)

However, one youth noted that her vegetable farm was destroyed during road expansion in the area. Generally, young farmers in Kakamega Town were vulnerable to risks such as livestock, vegetable theft, insect pests and diseases and shocks such as inadequate finances.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings as discussed above, the conclusions and the recommendations on policy and future research.

5.2 Summary of the findings

The main objective of this study was to assess the extent of youth participation in vegetable production towards improvement of livelihoods. This study intended to contribute to the field of urban farming and to the debate on the role of youth in promoting urban livelihoods through participation in vegetable production. Guided by the Theory of Planned Behaviour, Sustainable Livelihood Approach, and a conceptual framework the study problem was better understood.

5.2.1 Contribution of youth to vegetable production

With regard to vegetable production practices, the youth mainly engaged in land preparation, planting, weeding, pest and disease control, irrigation, harvesting, selling, and buying of farm inputs. On average, the youth spent four hours and thirteen minutes with a standard deviation of one hour working on their vegetable farms. A correlation analysis indicated that there was a significant relationship between the youth's age and plot size with the length of time the youth spent working on the farm per week.

Some of the farmers engaged in farming in the afternoon during weekdays, others both in the morning and afternoon on weekends, weekdays and during holidays and

another group in the morning on weekends and weekdays. About 30% of the youth had engaged in urban farming for between 2 and 4 years. More than 70% of the youth reported that acreage under vegetable farming was increasing. Nine in every ten youth were intending to continue participating in vegetable production in Kakamega Town.

The reasons for youth involvement in vegetable production included: food supply, save food expenditure, income generation, use available space, better nutrition, reduce the food expenditure, hobby or leisure and culture. Some youth do not take up farming serious because of negative attitudes, inadequate time, inadequate land and insufficient information. The high and quick economic returns, academic qualifications and interests were some of the reasons cited by youth for engaging in other economic activities. It was revealed that urban farmers engaged in farming as well as other economic activities such as selling of groceries, hawking, saloon and barbershop among others.

5.2.3 Access to farming resources

The youth acquired the plots for vegetable production through negotiation with the County Government of Kakamega, borrowing from landlords or friends, hiring from neighbours and landlord, inheriting from parents or relatives and buying. The mean size of the vegetable plots was 25 m². Some of the youth indicated that the plots were inadequate for vegetable production.

Most of the youth were irrigating their vegetable farms during the dry season. Water for irrigation was obtained from water kiosks, piped-borne water, recycled waste water, rivers or streams and boreholes. Access to water mainly promoted continuous production and increased yields of vegetables.

Farm inputs were obtained from the youth' own farms, agro-veterinary shops (by buying), from neighbours and friends (by borrowing or exchanging with vegetable produced). The youth obtained finances from personal savings, parents, friends, relatives, neighbours, other farming activities, financial institutions and Youth Enterprise Development Fund (YEDF).

The farmers obtained farm labour from their parents, siblings, spouses, relatives, friends, children and hired labourers. A few of the farmers sought extension services from agricultural shows, KARI, County Agricultural Office, agricultural desk at Bukhungu Office and demonstration farms. Youth were influenced by their parents, siblings, neighbours, friends, relatives, mass media and extension officers. Some of the youth grew the vegetables commonly found in their neighbourhood while others were influenced by their parents.

5.2.4 Benefit of vegetable production on livelihood

Some of youth revealed that vegetable production was adequate for food, others noted that it was more than adequate, and the remaining proportion reported that it was less than adequate. During off-peak season, youth obtained vegetables from estate kiosks, town markets, neighbours, friends and rural home. A mean of Ksh 25 was used for green vegetables per meal during the off-peak season between the month of November and February.

The money obtained from vegetable sales was used at household level to cater for family expenses and investment in vegetable production as well as at community level for payment of group membership subscription. Urban female youth engaged more in social activities while men in political activities. The youth were aware of the

environmental issues related to urban vegetable production which included soil erosion, pollution and risks.

5.2.5 Constraints to vegetable production and livelihoods

Most of the youth were experiencing vegetable production challenges. The main challenges faced by youth included chicken destruction of vegetables, insect pests and diseases, vegetable theft, inadequate land for vegetable production and insufficient finances in that order.

To promote access to more land the youth hired, borrowed or used mobile gardens. The local administrators resolved conflicts between chicken keepers and vegetable farmers. Some farmers used old mosquito nets, old rusty iron sheets and sacks to control the chicken from invading the vegetable farms. Agrochemicals and wood ash was used to control insect pests and diseases attacking vegetables.

Some youth reported vegetable thieves to local administration, to the parents of the culprits in case of children, while others warned the culprits and left the culprit without warning them. KARI has developed seed varieties that were favoured by the climatic conditions in Kakamega Town and its neighbourhoods.

In Kakamega Town, overcrowding was witnessed in a number of estates where youth were living. This predisposed the urban dwellers to poor housing, inadequate sanitation facilities and insufficient garbage collection mechanisms. Furthermore, due to urban poverty some of the unemployed youth had to seek different ways of sustaining their livelihood such as farming, groceries among others. Some youth engaged in local politics as campaigners and were susceptible to injuries and arrests during political violence.

5.3 Conclusion

The current generation of youth engaging in vegetable production was contributing to the intergenerational and intragenerational sustainability of urban farming. This was manifested in the level of participation in vegetable production, length of time they spent working on the farm, and the intentions to continue with the activity in future. Furthermore, the future farmers (children of current farmers) would get support from their parents in terms of securing farming resources, farming skills and knowledge. However, some of the youth were not planning to continue with the activity in future and this could be attributed to their attitudes (attitude towards behaviour), insufficient support from other individuals (subjective norm) and inadequate farming resources (perceived behavioural control).

According to Sustainable Livelihood Approach, the poor engage in diverse activities to promote sustainable livelihoods. The youth with intentions to promote livelihoods engaged in selling groceries, hair dressing, selling clothes, charcoal selling, transport services, selling fish and roasted maize and computer and money transfer services (M-pesa). The livelihood outcomes of vegetable production had virtuous impacts to the sustainability of livelihoods. The farmers supplied food to their household and the market as well as saved the food expenses. The income obtained from vegetable sales was used to promote livelihoods at individual, household and community level. Furthermore, this income enabled women to pay their group membership subscription fee.

According to the Theory of Planned Behaviour and Sustainable Livelihood Approach the role of individuals, stakeholders, institutions and policies (subjective norms and Policies, Institutions and Processes) were important in promoting youth participation

in vegetable production. The parents, siblings, land lords, relatives, mass media, friends, neighbours, County Government of Kakamega, agricultural officials and Estate elders were significant in promoting access to vital farming resources, influencing the decision to start farming and minimizing the challenges that youth encounter during vegetable production.

5.4 Recommendations

5.4.1 Recommendations on policy

The findings and discussions in Chapter four provide an insight into what has been done to enhance effective participation of youth in the endeavour of achieving Vision 2030, Sustainable Development Goal Number one and two by 2030 and the implementation of Kenya National Youth Policy. It is imperative to promote youth participation in urban vegetable production in Kakamega Town at individual, household, estate, community and town level. This is pegged on the significance of vegetable of production at the above mentioned levels.

At individual level, there is a great need for the youth that have conceived urban vegetable production (agriculture) as an activity meant for the elderly to change their perceptions. The agricultural extension officers should sensitize the youth on the importance of vegetable production by use of social media like Face Book and Twitter which the youth tend to use more than the mass media. Television Programme like “*Shamba Shape Up*” in Citizen Television station and published articles like “Smart Harvest” in Standard Newspaper provide relevant and current information which could supplement the extension services from KARI, Agricultural shows, Town Agricultural offices and the agricultural desks near the Bukhungu chief’s office. Since urban vegetable production requires minimal time and space for production, the busy

youth should integrate farming and learning or formal employment. Some farmers engaged in vegetable production during free time such as before or after classes or work, on weekends and holidays.

Parents were critical in promoting youth participation in vegetable production through provision of farming resources, and transfer of knowledge and skills necessary for vegetable production. Parents should encourage their children while still young to venture into farming by emphasizing its importance and supporting them financially and/or morally. Since access to land is important in vegetable production (farming), parents owning land within the town should allocate their daughters and sons plots to cultivate vegetables. Older siblings should provide guidance in terms of the skills and technical knowhow as well as financial assistance where necessary so that their younger siblings could participate fully.

At community level, schools and extension officers should be at the front line in supporting youth that intend to engage in vegetable production. Schools are critical in promoting agriculture, through programmes 4-K clubs an acronym for Kuungana, Kufanya, Kusaidia, Kenya, which means “get together, act and help Kenya” (Foeken, 2006) at primary school level and Young Farmers Association at the Secondary school level where youth are able to acquire agricultural knowledge and skills. It is noteworthy that those youth that were examined in agriculture at Primary or Secondary school level were using the knowledge, skills and experience gained while still in school.

Opinion leaders and elites such as ward representatives in Mundiri, Amalemba and Matende estates should encourage youth to engage in vegetable production through organizing forums like “youth bungenes” (*bunge* is a Kiswahili word for parliament)

where the youth could not only discuss politics but also vegetable production. This could be done by organizing events such as football matches or workshops where youth were likely to come. The extension officers should establish a demonstration farm in every estate in co-ordination with the local administration so that the students, employees or busy youth that have inadequate time to seek extension services that were far from their area of residence can seek the services. Furthermore, youth should be sensitized to form vegetable production groups that were critical in securing loans, funds and land from government institutions which is in contrast with the current state where there is no farming groups.

There should be a better sourcing and allocation of financial resources to youth especially those that were in groups in co-ordination with the Youth Enterprise Development Fund, Uwezo Fund, Women Fund and other support programs. There should be sensitization on the environmentally friendly innovations of reducing insect pests. There should be environmentally viable, cheaper and easily accessible nets that were produced by KARI that could be used to contain chicken from straying into the vegetable farms. This would reduce conflicts between neighbours and discouragement due to loss of produce. The local administration should roll out an effective way of providing security to the vegetable farms. There should be formation of security unit that could handle vegetable theft and enactment of laws that govern vegetable theft. This is important in reducing incidences of vegetable theft that is rampant in the area.

The County Government of Kakamega could allocate some land to the youth groups that were interested in vegetable production. There were free spaces such as within compounds hosting the governmental offices like Ministry of Water, Lands and Housing. This would motivate the youth who have no access to land to participate in

urban vegetable production. Furthermore, the Town By-laws governing UA and agricultural fund could be enacted to facilitate youth projects in vegetable production.

In a nutshell, the promotion of youth involvement in vegetable production in Kakamega Town depends on the youth themselves, the parents, the community based institutions, County Government of Kakamega and Non-Governmental Organizations.

5.4.2 Recommendations for further research

Youth participation in vegetable production is critical in intergenerational and intragenerational sustainability of urban farming. The youth contributed to food supply, income generation, social and political association and environmental sustainability in Kakamega Town. Since the study was based in Kakamega Town, more research should be conducted in other urban centres to establish youth participation in vegetable production towards improvement of livelihoods using other theoretical framework, models or approaches.

It was revealed that youth participation in household vegetable production contributed to food supply, saved on food expenses, and provided income for the youth. Thus further studies should be carried out on the youth participation in urban vegetable production on community and government lands (off-plot farming) such as religious institutions, schools, government offices and health centres using Geographical Information System techniques.

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APPENDIX 1: QUESTIONNAIRE FOR YOUTH VEGETABLE FARMERS**PREAMBLE:**

I am a post graduate student at Moi University Main Campus undertaking a Masters of Arts degree in Geography in the School of Arts and Social Sciences. I am conducting a study on the “*Youth participation in vegetable production towards improvement of livelihoods in Kakamega Town, Kenya.*” This study is conducted purely for academic reasons. It is meant to seek your opinion and not to demean you in any way or whatsoever. Your identity would not be revealed to any one unless by your permission and that your responses would be treated with uttermost confidentiality. In view of this therefore, I humbly request you to fill the attached questionnaire to the best of your knowledge.

Thank you.

SECTION A. DEMOGRAPHICS OF RESPONDENTS

A1. Age _____

A2. Gender: Male [] Female []

A3. Ethnic background: _____

A4. Highest level of Education: 1= Primary [] 2 = Secondary [] 3 = College []
4 = University [] 5 = Non formal Education [] 6 = Other (Specify)

A5. Relationship with Household head: Self [] Husband [] Son []
Daughter [] Nephew [] Niece [] Cousin [] Friend []
Employer [] Co-headship [] Other (Specify) _____

A6. State your occupation: _____

A7. Household size (members): one [] two [] three [] four [] five [] six []
Above 6 []

A8. State County/town you were born from: _____

A9.. Main reason for migration to Kakamega Town: 1 = seek job opportunities

2 = Join a Spouse 3 = Visit relatives 4 = for better life

5 = for education 6 = Other (Specify)_____

SECTION B: CONTRIBUTION OF YOUTH TO VEGETABLE PRODUCTION

B1. Which is vegetable production practices do you engage in more frequently?

(Multiple answers possible and rank in order of importance where 1 = always involved, 2 = rarely involved and 3 =Never involved)

1 =Land preparation 2 = Planting 3 = weeding

4 = pest and disease control 5 = harvesting 6 = Selling

7 = other (specify)_____

B2. How many hours do you spend working on your farm per week _____

B3. At what time do you normally engage in vegetable cultivation? **(Multiple answer possible)**

1 = In the morning during week days 2 = In the afternoon during weekdays

3 = In the morning on weekends 4 = In the afternoon on weekends 5 = in the morning

during holidays 6 = in the afternoon during holidays

B4. For how long have you been engaging vegetable production within Kakamega

Town? 1 = Less than 2 years [] 2 = Between 2 and 4 years [] 3 = Between 4 and 6

years [] 4 = Between 6 and 8 years [] 5 = more than 8 years

B5. What is the trend of the size of vegetable farm? 1 = Increasing

2 = declining 3 = remained the same 4 = I do not know

B6. Do you intend to continue participating in vegetable production in future?

1 = Yes 2 = No

B7. Which type of vegetables do you grow within Kakamega Town? (**Multiple answers**)

1 = Sukuma wiki (Kales) 2 = cow peas 3 = Saga (Spider weed) 4 = pumpkins (leaves)

5 = Tsimboga (Amaranthus spp) 6 = other (specify) _____

B8. Why do you engage in urban vegetable production? (**Multiple Answers possible**) 1= Food supply 2 = nutrition 3 = an occupation 4 = save on food

expenses 5 = source of income 6 = gain economic independence 7 = use

available space 6 =leisure or hobby 7 = culture 8 = Other (Specify) _____

B9. Do we have some youth that do not engage in vegetable production in Kakamega Town? 1= Yes 2 = No

B10. If yes in B 9, why do some youth within Kakamega Town not participating in vegetable production? (**Multiple answers applicable**)

1 = negative attitude towards farming 2 =inaccessible to farming knowledge 3 =

inadequate support from parents or siblings 4 = insufficient assistance from extension

officers 5 =inaccessibility to land 6 =inadequate financial resources 7 =

insufficient time 8 = Other (Specify) _____

B11. What is the main reason for engagement in other livelihood activities? (**Multiple answers possible**) 1 = Higher and quick financial returns 2 = Interesting

3 = Academic qualifications 4 = Job satisfaction

5 = other (specify) _____

B12. Which income generating activities do you engage in within Kakamega Town?

(**Multiple Answers Possible**)

1 = Vegetables Production 2 = Boda boda / motorcycle 3 = selling groceries

4 = saloon 5 = charcoal selling 6 = other (specify) _____

SECTION C: ACCESS TO FARMING RESOURCES

C1. How did you acquire the land? (**Multiple answers possible**)

1 = Inherited 2 = Hired 3 = Bought 4 = Negotiation with County

Government of Kakamega 5 = borrowed 6 = other (specify) _____

C2. What is the size of your vegetable plot? (**Estimate in m²**) _____

C3. Is the current land you are accessible to adequate for vegetable production

1 = Yes 2 = No

C4. State your level of agreement to whether accessibility to land influences you to

participate in vegetable production. 1 = Strongly Agree

2 = Agree 3 = Unsure

C5. If accessible to water, do you irrigate your vegetables during dry season?

1 = Yes 2 = No

C6. From which sources do you obtain water for vegetable irrigation? (**Multiple responses applicable**). 1 = Rain water 2 = piped water

3 = Water kiosks 4 = Recycled water 5 = River/ stream
 6 = Borehole 7 = Other (specify)_____

C7. How does access to water influences your vegetable production? State your level of agreement on scale (1 = **Strongly agree** 2 = **Agree** 3 = **Disagree** 4 = **Strongly Disagree**) 1. = Increases yields 2 = promotes continuous production

3 = Leads to soil erosion 4 = contributes to soil pollution

C8. What are the main sources of farm inputs (Seeds/seedlings, fertilizer and agrochemicals)?(**Multiple responses**) 1 = Buying 2 = Borrowing 3 = Own

farm 4 = Exchange with other goods 5 = Other (sepcify) _____

C9. Where do you obtain financial resources for vegetable production? (**Multiple Answers**) 1= personal savings 2 = Youth Enterprise Development Fund

3= other farming activities 4 = Friends 5 = Neighbours 6 = Relatives

7 = Financial institutions 8 = others (specify) _____

C10. Who else provides labour on the vegetable farm apart from you? (**Multiple answers**) 1 = Parents 2 = siblings 3 = Relatives 4 = Friends

5 = Employees 6 = Other (Specify)_____

C11. Where do you seek the extension services? (**Multiple answers possible**)

1 = Town agricultural offices 2 = KARI 3 = Agricultural Show 4 = Chief's office
 5 = Demonstration farms 6 = other (specify) _____

C12. If not seeking extension services, why not? (**Multiple Answers possible**)

1 = Inadequate time 2 = obtain from parents 3 = obtain from friends

4 = Obtain from Neighbours 5 = do not require 6 = Not aware where to get
 7 = other (specify)_____

C13. Who influenced you to begin cultivating vegetables within Kakamega Town?

(Multiple Answers possible) 1 = Parents [] 2 = Relatives [] 3 = Friends [] 4 =

older siblings [] 5 = Neighbours [] 6 = Extension officer 7 = Media

Others (Specify)_____

SECTION D. BENEFIT OF VEGETABLE PRODUCTION TO LIVELIHOOD

D1. How would you describe the adequacy of vegetables obtained from your farm?

1 = More adequate 2 = Adequate 3 = Less adequate

4 = I do not Know

D2. Where do you obtain vegetables during off peak season? **(Multiple answers)**

1 = Estate kiosks 2 = Town market 3 = Neighbours 4 = Friends

5 = Rural home 6 = other (specify)_____

hmD3. How much money do you spend per day on vegetables during off peak season

(Estimate in Ksh)

1 = Less than Ksh 10 2 = Ksh10 - 20 3 = Ksh 20 -30 4 = Ksh 30-40

5 = Ksh 40 -50 6 = More than Ksh 50

D4. If selling vegetables, how much do you get per day? **(Estimate in Ksh)** _____

D5. How do you use of the money obtained from vegetable sales? (**Multiple answers Possible**) 1 = cater for family expenditure 2 = save for future use

3 = invest in vegetable production 4 = pay group membership subscription

5 = Other (Specify) _____

E. CONSTRAINTS TO VEGETABLE PRODUCTION

E1. Do you experience any production challenge? 1 = Yes 2 = No

E2. Which constraints do you face? (**Multiple Answers possible**)

1 = Inadequate land 2 = Inadequate finances 3 = chicken destroying vegetables

4 = Pests and diseases 5 = Vegetable theft 6 = Heavy rainfall 7 = Insufficient water 8

= Restrictive Town policy 9 = other (specify) _____

E3. If experiencing the constraint of inadequate land for vegetable production, how do you increase access to more land? (**Multiple responses applicable**) 1 = Hire

2 = Borrow 3 = use mobile garden 4 = other (specify) _____

E4. If experiencing vegetable theft, how do you handle a thief caught red-handed?

(**Multiple answers possible**)

1 = Report to parents 2 = Report to local administration 3 = Report to police

4 = Warn the culprit 5 = leave the culprit without warning 5 = never caught

one 6 = Other (specify) _____

Thank You!

Nice time

Gender:

Place of residence:

APPENDIX 2: INTERVIEW SCHEDULE FOR SELECTED FARMERS

- (a) Do you plan to continue with urban vegetable production?
- (b) Would you encourage your children to participate in urban vegetable production? If Yes, Why?
- (c) How is vegetable production important to you and your family? Please explain:
- (d) Do you think the current plot enough for your vegetable production? If No, Why? How do you solve the problem?
- (e) Have you ever cultivated vegetables on mobile gardens? If yes, where did you get the idea?
- (f) If yes in (f) how did you get the materials used for making the mobile garden?
- (g) Have your vegetables ever been destroyed by the County Government of Kakamega or evicted from your current farm?
- (h) In your own opinion what should be done to increase provision of agricultural extension services?
- (i) Do you use waste water for irrigation of vegetables? If yes, where do you obtain the waste water from?
- (j) What would you suggest be done to prevent chicken from destroying vegetables?
- (k) In your own opinion, do you think mosquito nets could be used to prevent chicken from destroying your vegetable?

- (l) How did you secure the nets (if currently using) that you use for controlling chicken from destroying your crops?
- (m) How do you reduce vegetables theft in Kakamega Town?
- (n) Apart from challenges related to vegetable production do you experience any challenges in your stay in Kakamega? If yes which one (s)?

Thank you!

Nice time

Designation:

**APPENDIX 3: INTERVIEW SCHEDULE FOR ESTATE ELDER /
AGRICULTURAL OFFICER**

- (a) Do(es) you(r)department support youth participation in vegetable production in Kakamega Town? If yes, How? If No why?
- (b) Do you work in coordination with other agricultural institutions to support vegetable production in Kakamega town? If Yes, which organizations or associations? If No, why?
- (c) What is the importance of youth participation in the urban vegetable production? Please explain.
- (d) Are there laws, policies or regulations that hinder the effective provision of various services to the vegetable farmers within Kakamega town? If Yes which ones? How do this influence youth participation in vegetable production?
- (e) Do you encounter any challenges that influence your effective support of performance? If Yes which ones? How do you reduce them?
- (f) What should be done to promote youth participation in urban vegetable production in Kakamega Town?

Thank you!

Nice time