

**INFLUENCE OF SOCIAL DIMENSION ISSUES ON
SUSTAINABILITY OF URBAN AGRICULTURE IN
KAKAMEGA TOWN**

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A Project report submitted in partial fulfillment of the requirement for the award of the degree of masters of Arts in project planning and management of the University of Nairobi.

2013

DECLARATION

The project report is my original work and has not been presented for any award in any other university

Sign -----

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DEDICATION

I dedicate this study to my father Mr. Hannington M.B.Wegulo and Mum Clarice Mutali who encouraged me a lot to pursue this course .My daughter Abigael Namisoho who at tender age missed Daddy's care as I was undertaking my studies, my wife Dorothy B Wegulo who had to innovatively find something to do over the weekend while I was busy with my studies

To all my family members I wish them well.

ACKNOWLEDGEMENT

I appreciate the efforts made by my teachers and parents who supported in my education. My sincere thanks go to all my lecturers who equipped me with the knowledge and skills to carry out this research .They are: my supervisor Dr.Stephen Luketero of the University of Nairobi, and my Lecturers Dr. Alice Owano, Dr. Ochola Charles, Dr. Mbugua and Dr. Ouro who taught me and took me through the procedures of research and writing of research proposal.

I thank my father, Mr. Hannington M.B. Wegulo and my mum Clarice Mutali who provided for the basic education and also encouraged me a lot during the masters course.

I thank my family members who gave me moral support during the course. My colleagues in chemistry and mathematics departments, who supervised, administered examinations to my students while I was undertaking my studies.

TABLE OF CONTENT

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
ABBREVIATIONS AND ACRONYMS	viii
List of tables.....	ix
ABSTRACT.....	x
CHAPTER ONE	1
1.0 Background of the study	1
1.3 Purpose of study.....	7
1.5 Research questions.....	7
1.6 Significance of study.....	8
1.7 Delimitation of the study	8
1.9 Assumption of the study	9
1.10 Definition of significant terms used in the study.....	9
1.11 Organization of the study.....	10
CHAPTER TWO	11
LITERATURE REVIEW	11
2.1 Introduction.....	11
2.2 Global perspectives of social sustainable development.....	11
2.3 Human capacity for sustainable urban	13
2.4 Social capital and sustainability of urban agriculture	15
2.5 Access to resources and sustainability of the urban agriculture	17
2.6 Participation and sustainability of urban agriculture	18
2.7 Poverty and sustainability of urban agriculture	20
2.8 Theoretical framework.....	22
2.9 .conceptual framework.....	23
2.10 Summary of literature review	24
2.11. Research Gaps.....	24
CHAPTER THREE	25
RESEARCH METHODOLOGY.....	25

3.1 Introduction.....	25
3.2 Research design	25
3.3 Target population	25
3.5 Research Instrument.....	28
3.5.1 Pilot Testing.....	28
3.5.2 Validity of data collection instruments	29
3.5.3 Reliability of data collection instruments	29
3.6 Data collection procedures.....	29
3.7 Data analysis techniques	30
3.8 Operation definition of variables	31
CHAPTER FOUR.....	33
DATA ANALYSIS, PRESENTATION AND INTERPRETATION OF RESULTS.....	33
4.1 Introduction.....	33
4.2 Response return rate.....	33
4.3 Demographic characteristics of the respondents.....	34
4.4 Human Capacity and sustainability of urban agriculture.....	35
4.5 social capital and sustainability of urban agriculture.....	38
4.6 Access to resources and sustainability of urban agriculture	39
4.7 Participation and sustainability of urban agriculture	41
4.8 Poverty and sustainability of urban agriculture	43
4.9 Qualitative data analysis	44
CHAPTER FIVE	46
SUMMARY OF THE FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS.....	47
5.1 Introduction.....	47
5.2 Summary of findings.....	47
5.3 Discussion of findings.....	49
5.4 Conclusion	52
5.5 Recommendation of the study	54
5.6 Contribution to knowledge	54
5.7 Suggestions for further studies.....	55

REFERENCES	56
APPENDICES	59
APPENDIX 1: INTRODUCTION LETTER.....	60
APPENDIX II TRANSMITTAL LETTER.....	61
APPENDIX III:URBAN DWELLERS (FARMERS) QUESTIONNAIRE.....	62
APPENDIX III:FIELD ASSISTANCE QUESTIONNAIRE.....	65
APPENDIX IV:SOCIAL WORKERS QUESTIONNAIRE.....	66
APPENDIX V: A LETTER OF AUTHORIZATION FROM UNIVERSITY.....	67
APPENDIX VI.RESAERCH PERMIT	68
APPENDIX IV:TABLE FOR SAMPLE SIZE.....	69

ABBREVIATIONS AND ACRONYMS

ASDSP: Agricultural Sector Development Support Program

A.N.C : African Nation Congress

C.D.A: Cooperative Development Agencies

E.U : European Union

FAO: Food and Agricultural Organization

FBO : Faith Based Organization

G.O.K: Government of Kenya

G.O.U: Government of Uganda.

KARI: kakamega Agricultural Research Institute

KAPAP: Kenya Agricultural Productivity Agri-business Projects

LLI : Local Level Initiative

OECD: Organization for Economic Cooperation Development

RUAF: Resources for Urban Agriculture Foundation

UA : Urban Agriculture

UN : United Nations

UNCHS: United Nation Center for Human Settlement

UPAL: Urban and Peri-urban Agriculture and Livestock

WCED : World Commission on Environment and Development

WUP : World Urbanization Prospects

LIST OF TABLES

Table 3.1 Study sample frame.....	28
Table 3.2 Actual sample size reached.....	29
Table 4.1 Questionnaire response rate.....	35
Table 4.2 Gender of respondents.....	36
Table 4.3 Age of respondents.....	36
Table 4.4 Local knowledge and sustainability of urban agriculture.....	37
Table 4.5 Skills and sustainability of urban agriculture.....	38
Table 4.6 Availability of labor and sustainability of urban agriculture.....	39
Table 4.7 Permanent labor practice and sustainability of urban agriculture.....	39
Table 4.8 use of child/elderly labor and sustainability of urban agriculture	40
Table 4.9 Social network and sustainability of urban agriculture.....	40
Table 4.10 Access to land and sustainability of urban agriculture.....	41
Table 4.11 Access to water and sustainability of urban agriculture.....	42
Table 4.12 Access to credit and sustainability of urban agriculture.....	42
Table 4.13 Socio-technical support and sustainability of urban agriculture.....	43
Table 4.14 Interest groups and sustainability of urban agriculture	43
Table 4.15 Direct engagement and sustainability of urban agriculture.....	44
Table 4.16 Food sufficiency and sustainability of urban agriculture.....	44
Table 4.17 Food cost/access and sustainability of urban agriculture.....	45

ABSTRACT

The research project discusses social dimension issues of the urban dwellers on the sustainability of urban agriculture in Kakamega town. The study focused on the social dimension of sustainable development as it was most neglected and unexplored, despite the fact that it was the objective of sustainable development. The study was guided by the following objectives: to determine the influence of peoples' capacity on sustainability of urban agriculture in Kakamega town, to examine the contribution of social capital on sustainability of urban agriculture in Kakamega town, to determine the influence of access to resources for sustainability of urban agriculture in Kakamega town , to examine the levels of participation of urban dwellers on sustainability of urban agriculture in Kakamega town and to determine the influence of poverty on sustainability of urban agriculture in Kakamega town. The target population was 5238 of the urban dwellers practicing urban agriculture. Questionnaires, target group interviews and observation were used to gather primary data to supplement the secondary data. The data collected was filtered and grouped according to the themes derived from the objectives. Descriptive analysis was used to show the pattern of response. Quantitative analysis used thereafter in manipulation of data after coding and tools such as spearman rank correlation used to investigate the relation between the strata. It was found that all the variables had a strong correlation of above 0.6 between the two groups of study. Similarly the performance in the variable on capacity related to human capital had a stronger influence on the others .This was dependent on the consciousness of an individual and influenced the performance of other variables; hence to be reinforced. The sub-themes: labor raise aspects of inequality between the gender with bias on women, issue of child labor and the aged as stakeholders whose vulnerability was at stake hence need to create safety nets for them through a policy. The variables on social capacity and participation had a strong influence on sustainability of urban agriculture for both groups of study hence need to strengthen them through policies. The relationship between poverty and access to resources appeared linear and had a direct influence on sustainability of urban agriculture .The recommendation were that the socio-technical communication between the government and these groups, research, NGOs and academic institutions would guide the use of available space for local economic development, development of food policy and safety standards within a vibrant local food system.

CHAPTER ONE

1.0 Background of the study

The 21st century has been called the urban century, more people in the world live in towns and cities, World Urbanization Prospects, WUP (2011), (International institute for sustainable development, IISD, (2012). This was attributed to increased concentration of investments and opportunities but contrasted by a disparity in production, distribution and consumption patterns of urban dwellers. Social concerns manifested as poverty, deprivation, urban dereliction, hunger, population growth and dissemination of diseases, Dempsey et al (2009) and Ciroth and Franze (2011). This greatly impacted on the social sustainability of the people and local development in the urban setting.

Robust urban communities depend on the social sustainability of the people in their daily activities. But elusive in cases of complex composition of the population, urban sprawl and concentration of urban poor as observed in the United States of America, Canada, United Kingdom and Germany (WUP). In Sub-Sahara Africa countries such as South Africa, Nigeria and East African countries, have concentrated poverty in their urban areas, Africa Nation Congress (1994), Osinubi, (2003), G.O.K (2012).In Kenya, urban poverty was on the rise from 46.3% in 1992 to 52% in 2002, Kakamega central district statistics (2008).The rise in poverty levels and population handicapped production and consumption patterns among most urban dwellers.

According Smith *et al*, (2005) and WUP, the world population projection by 2020 was to rise to 7.5 billion, 57 % of them in urban. According to statistical Department, Kakamega central in 2008, Kakamega municipality population projection for 2012 was 119,187 with a high fertility rate 5.7 % and urban absolute poverty of 46.8% (55,780).This propelled food insecurity vulnerability at a localized level. For sustainable urban agriculture (UA) an ecosystem service, developed human capital, inclusivity and re-organization of limited resources were required. Thus social dimension issues provided a pathway, as social sustainability of people drove urban agriculture as a prevalent activity. But the nexus between social sustainability and urban agriculture was overlooked.

Urban agriculture practiced was climate-smart agriculture and conservation agriculture: both commercial and subsistence in safeguarding livelihood and local development. It was an agribusiness industry in cities of Germany, Netherlands and in Africa such as Kampala, Dar es Salaam and many Kenyan towns, Smith (2010) and G.O.K (2010), addressed Millennium Development Goals (MDGs) 1 and 7; food security, poverty and ecological sustainability (co-management), UNDP (1999);hence a development strategy. It provided food, energy, education and recreation, Smith (2010) and Stobbelaar *et al*, (2008), as such a social livelihood and hence a planning activity.

In the USA and the Great Britain cities, community-based food systems and community supported agriculture focused on food security, FAO (2007).In sub-Saharan Africa about 10% of the urban agriculture practiced was small-scale subsistent and commercial farming (FAO).It was linked to limited entitlement to units and factors of production .In Kenya up to 77% of urban

farmers were subsistent, UA created 0.7 million jobs and 3.7 million small and medium enterprises, G.O.K (2010), Smit, Nasr & Ratta (2001), Smith *et al*, (1987). It was a viable commercial venture and entrepreneurial strategy for urban dwellers, Porth and Hendrickson, (2012) Caleb *et al*, (2010), Memon and Smith (1992). Thus, the diverse nature of urban agriculture met needs of ever increasing population and gave insight into social transformation of a people.

Urban agriculture had a complex weave of society and environment. The material, energy and economic fluxes of urban agriculture produce shaped human well-being, human rights, human safety and health all critical to social life cycle assessment (SCLA), UNEP (2011) and Ciroth and Franze (2011) .Urban food systems created physical and cognitive distance among producers, consumers and their urban environment. Therefore social sustainability of the urban dwellers amidst unexploited or scare resources and practice at all levels were teased as areas of protection for a robust urban agriculture.

Over a billion people worldwide were food insecure, FAO (2009), UNICEF (2009). In the United States over 50 million people and 30 million in Europe were food-insecure and undernourished (FAO, FEBA (2010), Feeding America (2009). In sub-Saharan Africa the numbers of hungry people rose despite the increased global food production. According to Smit, Nasr & Ratta (2001), 40 %-70% of adults and children living in informal settlements had limited capacities. Kakamega municipality population projection for 2012 was 119,187 with a high fertility rate 5.7 % and urban absolute poverty of 46.8% (55,780). This led to food inadequacy; high cost of per capita food production, food access, utilization and asset accumulation for most urban dwellers. According to kakamega District Hospital information systems office (2008),

increase in conditions such as Skin disorders, intestinal worms' infection and diarrhea cases at 10,544, 3,559 and 2,473 respectively. The under five mortality rate per 1000 at 169; these linked to high poverty levels, poor environment, food insecurity vulnerability and poor nutrition.

In the USA, the United Kingdom and the Netherlands, urban agriculture involved the appropriations of knowledge and skills by the urban farmers, Robson and Berkes (2011). According to Holland *et al* (2012) it is indicated that urban agriculture was built on local knowledge of the urban dwellers to improve quality of life and sustain cultural traditions. There was gradual shift to production of modern valued crops, according to Dixon, Alan and Lee (2010), while Schans (2010), indicated higher levels of specialization and differentiation to enhance safety and high returns. Resource center on urban agriculture and food security, RUAF, (2010), asserts use of modern technologies. This shows that knowledge and skills were critical in urban agriculture and therefore investigated among the urban farmers in kakamega town.

Porth and Hindrickson, (2012) suggested that access to capital and land were a barrier to urban agriculture efforts. According to Urban Agriculture network (1996), farmers were reluctant to invest in their plots and many cities didn't subsidize materials for urban agriculture. RUAF indicated little support and financial investment for urban agriculture, in the USA the green fringe and urban farms were protected from the urban sprawl to enhance access to fresh food. The economic and social research council in the United Kingdom affirmed that access to land for urban agriculture was a challenge. In Netherlands urban planning captured the demands of UA, Schans (2012). This led to a conclusion that access to resources was vital for sustainability of UA; it was investigated among urban farmers in kakamega town.

Researchers disseminated agricultural research to farmers and developed new technologies based on farmers needs, (RUAF) .Deper (2009) cited by Schan (2012), suggests that politicians recognized the role of Urban Agriculture in reconnecting modern city dwellers and there sources of food. Academic institutions and researchers in both developed and developing countries coordinated private, civil society groups and other public institutions to facilitate information exchange, (FAO). This showed that social capital and participation by various stakeholders in urban agriculture was critical hence investigated. Smith (2010) asserts that there was a complex relationship between urban agriculture and poverty. Poverty made the poor engage in poor farming activities, GOK (1999).According to Haddad et al (1998), poverty in urban areas made food insecurity and malnutrition a substantial problem. The priority to raise the exchange between food adequacy, surplus and deficit remained a challenge for the majority of urban dwellers. The influence of poverty on sustainability of urban agriculture was investigated in kakamega town.

The huge necessity of critical actions in urban agriculture emphasize equity and fairness, long term view and system thinking, IISD (2012) and Slaus and Jacobs (2011) , social quality and quality of life, Walker and Maessen, (2005), access to opportunities and sustainability of communities, Gough (2012). In this report the social sustainability criterion was explored, UNEP (2012) and Scott (2010); this integrated policy and practice of urban agriculture. However it remained elusive despite the efforts through legal and regulating framework.

1.2 Statement of the problem

It was estimated 15-20% of the world's food was produced in urban areas, Smith (2010). About 77% of the Kenyan population were gainfully employed in food and feed production, an equivalent of 0.7 million formal full-time jobs and 3.7 million small and medium enterprises,

G.O.K (2010), Smit, Nasr & Ratta (2001), Smith *et al*, (1987). Urban agriculture employed 29% urban households and 77% of urban farmers produced for own consumption, Smith *et al*, (1987), hence an important source of food security. It was a viable commercial venture for urban dwellers, Caleb *et al* (2010), Memon and Smith (1992); a development strategy. But this depicted a different picture for Kakamega town.

According to FAO (2009), a billion people worldwide were food insecure; 10.9 million children under 5 years died yearly due to hunger, UNICEF (2009). In the United States over 50 million people and 30 million in Europe were food-insecure and undernourished,(FAO,FEBA (2010),Feeding America (2009). According to Smit, Nasr &Ratta (2001), 40 %-70% adults and children in informal settlements suffer conditions that limit their capacities; a high cost of per capita food production, negative impacts on food access, utilization and asset accumulation for most urban dwellers. In kakamega town conditions such as diarrhea were 5,170, skin disorders 10,544 and intestinal worms' 3,559 all attributed to poor nutrition, poverty levels at 46.8 %, and access to safe foods. This shows that food security and changing nature of the urban areas made UA a critical activity. But sustainability of UA often overlooked the full range of social dimension issues: human health, participation, social capital, equity, ethics and poverty. They provided clues on society transformation and future organization of food system. Though elusive resented measurement quandaries but propelled UA in Kakamega town. This demanded generation of valuable information that was to guide policy and decision making among the stakeholders.

1.3 Purpose of study

The study assessed the social dimension issues on sustainability of urban agriculture in Kakamega town, Kakamega County. The social dimension of sustainable development (SD), as an objective of SD was to be explored in Urban Agriculture among the urban dwellers of Kakamega town.

1.4.0 General objective.

To investigate the social dimension issues of urban dwellers on sustainability of urban agriculture in Kakamega town

1.4.1 Specific objectives

1. To determine the influence of capacity of urban dwellers on sustainability of urban agriculture in Kakamega town
2. To examine the influence of social capital among the urban dwellers on sustainability of urban agriculture in Kakamega town.
3. To determine the influence of access to resources by urban dwellers on sustainability of urban agriculture in Kakamega town.
4. To assess the influence of stakeholders' participation on sustainability of urban agriculture in Kakamega town.
5. To determine the influence of poverty of urban dwellers on sustainability of urban agriculture in Kakamega town.

1.5 Research questions.

1. What is the influence of capacities of urban dwellers on sustainability of urban agriculture in Kakamega town?
2. What is the influence of social capital of urban dwellers on sustainability of urban agriculture in Kakamega town?
3. How does access to resources by the urban dwellers influence sustainability of urban agriculture in Kakamega town?

4. To what extent does stakeholders' participation influence urban agriculture in Kakamega town?

5. What is the influence of poverty among urban dwellers on sustainability of urban agriculture in kakamega town?

1.6 Significance of study.

Social sustainability of urban agriculture generates valuable information vital in the process of social development; basis for a scenario and the strategies to be developed. Urban agriculture contributed to food security and livelihood for subsistent farmers. For commercial farmers it was an increased opportunity to exploit the market potential by increased production, increased income and local level development. In practice, the departments for delivery of social services, agriculture and regional planning and development will be able to tap the potential of the people, integrate their systems and approaches into social investment while addressing urban poverty, food security and food safety for local development.

In theory the findings of this study would make it possible to understand the conscious capacity of the people learning from their daily experiences, develop and transfer knowledge into social change. Similarly the concentration of population provided the most reliable insight into the relationship between developed human capital, opportunity, choice and sustainability of urban agriculture.

1.7 Delimitation of the study

The study focused on the critical social dimensional issues of the urban dwellers; human capacities, social capital, access to resources, participation and poverty and their influence on sustainability of urban agriculture in Kakamega town. The samples of study were drawn from the

urban residents from all the settlements practicing urban agriculture within the boundaries of Kakamega town.

1.8 Limitation of the study

The study or research limited itself to the urban dwellers in the entire life cycle of products of urban agriculture in Kakamega. They involve the urban farmers, those selling these products and the consumers in the limits of kakamega town. The researcher maximized collection of information from the stakeholders above by zoning the town, then used a work schedule to access the zones to collect data to save time and money.

1.9 Assumption of the study

It was assumed that the quality of consciousness of people limited their options in production and consumption. This gave insight into the relationship between developed human capital and sustainability of urban agriculture. To achieve full potential of urban agriculture and local food systems required developed social sustainability. This involved addressing social issues and bridging communication among stakeholders in urban agriculture. That also the respondents provided the necessary information throughout the research process.

1.10 Definition of significant terms used in the study.

Social Sustainability: is the extent to which a neighborhood supports individual and collective well-being

Social dimension: factors or attributes derived from the social pillar of sustainable development

Urban agriculture: A project that involves growing, processing and distributing of food and non-food products using mainly resources, products and services found in urban area.

Sustainability of urban agriculture: a measure of the performance of urban agriculture projects

Human capital: individually used knowledge, skills, attitudes, and capabilities used in urban agriculture.

Social capital: features of social organization such as social networks, norms, trust that enhance

Urban agriculture

Participation: the direct involvement of all the stakeholders in urban agriculture projects

Poverty: state of low earnings, unemployment, a shortage of educational capital and patrimonial assets, inequities based on gender.

1.11 Organization of the study.

Chapter one represents the background of the study ,the statement of the problem ,the purpose of the study ,objectives of the study ,the research questions, the significance of the study ,limitation and delimitation of the study and the definition of significant terms as used in the study.

Chapter two discusses literature review on the social dimension issues in urban agriculture. They include Global perspective of these factors and then the Kenyan dimension. This chapter also captures the theoretical framework and the conceptual framework and the knowledge gap that the study will fill. Chapter three discusses Research methodology which includes Research design, target population, sample size, and sampling procedures, data collection procedures, data collection instruments, Reliability and Validity of the instruments, Pilot testing and data analysis techniques. Chapters four presents' data; interpretation, analysis and discussion .The analysis was based on the objectives of the study. These items include: human capacities, social capital, and access to resources, participation and poverty among the urban dwellers in Kakamega town. Chapter five discusses on the summary of the findings of the study, basing on the five objectives of the study, conclusions, recommendations and suggestions for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter consists of the literature review dealing with the secondary information on the assessment of social dimension issues of the urban poor and the challenge to sustainable development from different countries.

2.2 Global perspectives of social sustainable development

The ultimate goal of sustainable development was the well-being of people, contributing to the current needs of people and future generation, United Nation Environment Program (2009). Urban agriculture can fulfill most of urban dwellers needs like: food production, human resource welfare (sick, elderly education) and management of the green cover in urban areas, functioning as energy supplier, water buffer and processor of city waste. According to McKenzie (2004), social sustainability as a life enhancing condition and a process within communities creates opportunity in equitable access to health, education, between generations, a system of cultural relations and various ways of participation out of a developed sense of community awareness.

In Germany issues like labor, employment opportunities, health and safety dominate the debate. In Netherlands consumption, gender perspectives and demographics' characteristic of society: ageing population, poverty issues also observed in the United Kingdom, OECD (2001). The European Commission emphasized issues like employment and job creation, education and training for employability and the labor markets participation for women in knowledge society, challenges of an ageing society, according to European Council (2001).

McElroy (2011) used the term social footprint to measure organizational impacts on the quality and sufficiency of vital anthro- capital. These include the protection of the human and environmental capacities, both that are important in sustainability of urban agriculture. In European Union , based on urban policy adopted from 2005 Bristol accord , emphasis has been on exclusivity, equity, good governance, safety and accessibility ODPM (2006) &Colantonio (2007) and the Berkeley group in the United Kingdom, (2012) introduced aspects of social capital, social cohesion and well-being . These aspects measure the extent of social sustainability, giving a clue on societal transformation in urban based projects such as urban agriculture.

Colantonio (2009) uses capacity building, skills development in the environmental and spatial equality. The social realm of an individual and the society; equity, health, participation, needs, social capital, income, environment well-being and quality of life are captured. Spangenberg (2002),focused on the personal assets like education, skills, experience, consumption ,income and employment, then institutional stability aiming at interpersonal processes like democracy and participation, distribution and gender equity ,(institution orientation) or independent and pluralism, sources of information (organization) . It is evident that solutions aimed at addressing poverty must address; opportunity (of income, work, employment). Assets (land, house, and education) and safety nets provided by individuals and the government (Torjman 2002).The selected social objectives are: social security, health, social integration, equity, justice and freedom (Littig, 2001). They provided a full range of social dimensional issues that drive urban agriculture leading to urban development.

2.3 Human capacity for sustainable urban agriculture

Human capacities refer to human beings using their knowledge, skills, attitudes, and capabilities of individual as well as social and cultural endowment. The focus mostly was productive and creative capabilities of human beings harnessed to achieve higher and more sustainable levels of human welfare and wellbeing, Slaus and Jacobs (2010). It was the stock of talent, skill, know-how, intelligence, education and experience embedded within individuals that helped them to produce income (Schulz 2012). This was demonstrated by the way many urban dwellers were actively involved in production, processing, and marketing food and other products on land in urban areas, applying intensive production methods.

The knowledge, skills and developed values enhanced capabilities of the people for the constructive organization in UA. To ensure food security and appropriate nutrition of the ever increasing urban population, countries such as United States of America and United Kingdom adopted urban agriculture as a strategy of safeguarding the livelihoods of the poor. In sub-Saharan Africa a similar strategy of poverty alleviation has been used in South Africa, Rogerson (1998), and in Tanzania, Uganda and Kenya, (G.o.K 2010). Brown *et al* (2002), affirms that most vulnerable people in cities, such as the elderly and immigrants have experience and knowledge for production. The application of these knowledge and skills, Robson and Berkes (2011), Holland et al (2012) were efforts to improve the quality of life, workers' rights, democracy, and sustain cultural traditions (gender equity, adult literacy). In Netherlands urban agriculture symbolic role was to connect the urban dwellers and professional farmers in the adoption of large scale high –technology in pursuit of sustainable urban agriculture. Urban agriculture was dynamic in terms of production of modern valued crops according to Dixon, Alan and Lee (2010). This was defined by unique opportunities provided in the urban areas such

as demand for food, proximity to markets and availability of cheap resources such as labor, organic wastes and wastewater; they encourage diverse agricultural production systems.

There was increasing drive to enhance safety and high returns in urban agriculture. Schans (2010) affirms that increased production had been a result of specialization and differentiation. Resource center on urban agriculture and food security, RUAF (2010), assert that technologies such as hydroponics, organoponics, drip irrigation, zero tillage were found in cities; these were forms of conservation agriculture out of developed human capacity. Brown et al (2002), argues that UA in the United States had been enriched by the skills and technologies of immigrant populations. In most developed countries USA, United Kingdom, Netherlands and in sub-Saharan countries such as South Africa, Tanzania and Kenya training courses were offered to enhance food production. According to Schulz (2012) & World bank (2010), in the United States of America Skills and education at all levels lead to productive growth and better living standards. This showed that most UA practitioners with basic education are bound to be productive.

According to Olaniyan & Bankole (2005) the reason for a stunted economy of Nigeria was low human capital. The quality of human capital was dictated by the quality and quantity of education, health and nutrition available to the people. Ogwumike (1998) asserts that investment in human capital improved the quality of labor and its productivity in UA projects. Market chain development was encouraged in most countries, through differentiation and diversification when adopting a market strategy, processing and distribution. This showed that developed knowledge and skills were critical in UA hence investigated among the urban dwellers in kakamega town.

2.4 Social capital and sustainability of urban agriculture

Putnam (1993) defines social capital as features of social organization, associated norms and values, which create externalities for the community as a whole. Coleman (1990) defines it as different entities of some aspect of social structure that facilitates certain actions of actors. This linked like-minded people and reinforced homogeneity. The urban dwellers evolved complex alliances in relation to local economies that shaped institution around them Benjamin (2000). The organizations relation starts with labor on farms, social networks on marketing of the products from the farms.

In United States of America, community-gardening organization provided job training. The pace, quality and magnitude of most urban agriculture projects were influenced by partnerships: individuals, private organizations, and public groups and governments departments. Urban agriculture also contributes to a community's well-being and solidarity, Porth and Hindrickson, (2012). Neighborhoods within urban food systems had higher levels of social interaction and better security, Schans (2009). This created success of urban agricultural activities and often the fruits of their labor.

In urban centers bonds of reciprocity and trust tie family, friends and whole communities over hard times. These in urban agriculture increase volumes of existing products with low risk and with high returns through collective action in their social networks, Coleman (1990). Therefore, urban dwellers worked within groups to reduce costs of production, develop skills and knowledge for sustainability of urban agriculture. Cohesion and co-operation promoted employment through partnerships with the local actors in the local food systems, Schan (2010).

The strong areas of social input were voluntary and a strong presence of linking social capital in production, organization of resources and consumption in urban agriculture for urban dwellers.

A survey by the International Labor Organization in Tanzania found that urban agriculture often helped the weakest members of poorer communities disproportionately, as the aged, youth, women, migrants, immigrants, refugees, and people in long term civil crises. In both Nairobi and Dar es Salaam, the supply relationships between poultry keepers and vegetable farmers were well established for fertilizer provision (FAO). This provided opportunities to those of limited resources and enhanced scaling of produce within the local food system.

Okunmadewa *et al.*, (2005) asserts increased use of Local Level Institutions (LLIs) in addressing poverty in Nigeria. Disaggregating social capital reveals that diversity among membership, focus and has positive strong influence on the per capita expenditure of households. In Kenya, 'piga njaa marufuku' as a development strategy promotes urban agriculture activities as a targeted project.

From the literature reviewed above, the gap between actual opportunities for the urban dwellers is often caused by various dimensions of exclusion, low social capital and less opportunity for the poor to participate, World Bank (2007). Social networks in urban areas were strengthened through active facilitation of relationships which provided urban residents with information, material resources, technical support and solidarity critical in urban agriculture.

2.5 Access to resources and sustainability of the urban agriculture

The urban population growth has been very rapid approaching a demographic inflection point, a projection of over 300 million between 2000 and 2030 more than rural population WUP (2011) and Brockerhoff (2000). The effect was competition over resources such as land, water and even human resource required for urban agriculture. Porth and Hindrickson, (2012) suggests that access to capital and land are a barrier to UA efforts. This was common in urban area where land faced challenge of urban sprawl. According to Urban Agriculture network (1996), farmers were reluctant to invest in their plots because of the risk and many cities don't fund or subsidize material for UA. In sub Saharan Africa most urban poor were found in the informal settlements and had to cope with such challenges as lack of farm lands, access to clean water, solid wastes, waste water and tenure issues. RUAF indicated very little support and financial investment for UA. The economic and social research council in the United Kingdom indicated that access to land for UA is a challenge. These changes affected the nature of activities, their rapidity and as the rapid urbanization takes place affecting the functional urban area, even as UA was incorporated as one of the activities.

However, urban agriculture was a viable commercial venture for the middle and high income households (Caleb *et al*, 2010; Memon and Smith 1992). Population mobility was crucial in ensuring sustainable livelihoods by distributing members across different spatial and economic activities to diversify income sources and reduce risk in the constant uncertainty in climate and markets, Brockerhoff (2000). Access to land and water and the availability was critical to the successful integration of urban and peri-urban agriculture with urban environments. All this influenced by rapidly changing land rights, uses, and values.

In the USA and the Great Britain community-based food systems and community supported agriculture focused on community food security, this linked those that lacked space to those with farms. In the United States, 30% of the agricultural output was within metropolitan areas. Urban farmers and gardeners were of a wide range of economic levels and relationships to the market. The American planning Association (APA), Food interest Group (FIG), a coalition on food systems planning at local, regional and national level. NGOs initiated UA projects that involved disadvantaged groups such as disabled, immigrants, elderly to integrate them to urban network (RUAF, 2007). The participation in community food growing groups and city farms enhance development of technical skills, transfer of enterprise skills and engagement in formal learning /training. This led to a conclusion that access to resources was vital for sustainability of UA hence investigated among urban dwellers in kakamega town

2.6 Participation and sustainability urban agriculture

UNDP (2011) indicates that urban people do undertake initiatives as a way to show the local government their capabilities. The work could extend to education, health, welfare, agricultural projects and issues of governance. This could be through: interest groups/ pressure groups/ lobbies, promotion groups, volunteerism, social groupings and social activism. Over 800 million people were engaged in Urban Agriculture, Smith *et al*, (1996). This showed that urban agriculture was a prevalent activity.

Odhiambo *et.al* (2003) assert over 68% of the urban poor in Kenya are in the informal sector such as UA for their livelihoods. High levels of civil capital facilitated creation of effective institutions, critical in participation of people in social activities. Urban agriculture employed

about 29% of all urban households Smith *et al*, (1987). Studies indicated that up to 77% of urban farmers in Kenya produced entirely for own consumption making the sub-sector an important source of food security. Benjamin (2000) cites that planning and governance are shaped by the congruence of interest groups with conflicting interest which compete for resources. The American planning Association (APA), Food interest Group (FIG) ,a coalition on food systems planning at local, regional and national level.APA (2007) provided an overview of the connections between planning practice and the production, processing, packaging, distribution, transportation, access, consumption, and waste disposal of food .NGOs have initiated UA projects that involve disadvantaged groups such as disabled, immigrants, elderly to integrate them to urban network (RUAF,2007). In this manner community interaction is promoted by urban agriculture of different types and at various levels.

In Kenya agriculture had the highest self-employment earnings among small-scale enterprises and the third highest earnings in all urban Kenya (House *et al*. 1993).Direct engagement by institutions such as KARI, University, tertiary colleges and supplies of products promoted research, education, extension and outreach on the various social, environmental, economic and ecological dimensions of urban farming and sustainable food systems. Among the potential NGO partners active in UPA are those providing grassroots technical assistance in food, health care and nutrition, agricultural production methods, and services and employment .Academic institutions and researchers in both developed and developing countries are actively involved in coordinating private, civil society groups and other public entities to facilitate information exchange, (FAO).This ensures that new methods of production were adopted

Up to 77% of urban farmers in Kenya produce entirely for own consumption making the sub-sector an important source of food security, GOK (2010). However, urban agriculture was a viable commercial venture for the middle and high income households (Caleb *et al*, 2010; Memon and Smith 1992). This made urban agriculture to be such a big industry within the urban landscape and addressed issues of unemployment, inadequate nutrition, food insecurity and buildup of wastes in urban centers (RUAF). Researchers disseminate agricultural research information to farmers and develop new technologies based on farmers needs, (RUAF). Burra and Patel (2001) maintain that building partnerships for the urban poor makes access to land, infrastructure, housing and finance affordable. This magnifies the fact that many urban dwellers in urban agriculture work in networks to secure their interests and reduce cost of production and consumption. Odhiambo *et.al* (2003) assert that most urban dwellers engage in a wide range of activities both in the public and private (formal and informal) sectors mostly as employees but so UA. Thus, from the review it was evident that participation was critical in urban agriculture and therefore investigated.

2.7 Poverty and sustainability of urban agriculture

According to Smith (2010), there was a complex relationship between urban agriculture and poverty. Food security and appropriate nutrition of the urban population, in particular of the poorest households was a challenge in many cities in developing countries. In the United States, 50 million people are food-insecure (Feeding America, 2009). In Europe, there are 30 million undernourished people (FEBA, 2010). Most of the urban farming was undertaken by the vulnerable poor who are approximately 50 percent of the urban population living below the absolute poverty line, Rege *et al* (2005). Poverty made the poor to engage in poor farming activities, GOK (1999).

Poverty was characterized by low incomes, lack of access to income, assets and poor environmental condition, GOK (1999). Therefore they had had a higher per capita food production and their units of production were in competition with market forces. As such they suffered food insecurity, access and adequacy. The poor possessed assets such as labor, human capital, household relations, social capital and these complex assets and this affects their vulnerability to food access and adequacy. Urban food production was a crisis strategy, for survival of the poorer segment of the population.

Distinctive nature of urban poverty manifested in form of vulnerable groups such as women headed-households at 39.8 %, children headed households at 4.7 % and non-committed labor force 55995 (District statistics Kakamega central) in times of shocks and jots on the supply of basic needs. Recent surveys suggest that the locus of poverty was shifting to urban areas (Haddad *et al.* 1998), creating food insecurity and malnutrition in urban areas. Rapid and dynamic urban growth led to new patterns of social, economic challenges, opportunities and developmental priorities that required organization of resources. The urban farming communities were engulfed by sprawling urban built up; created social exclusion and lack of fit within the broader urban fabric, Keivani (2009). This was bound to work against the robustness of urban agriculture. As such there was need to investigate the influence of poverty on sustainability of urban agriculture.

2.8 Theoretical framework

Early human ecologists studied the analogy of plants communities as a way of understanding urban communities. Hawley Amos (1910-2009) an American sociologist extensively studied in many cities in America how human population interacted with their dynamic urban environment. He argued that the most important contribution to human ecology of collections of plants and animal ecologies is the perspective of collective life as an adaptive process consisting in an interaction of environment, population and organizations.

It is clear from the literature reviewed above, that the variables identified are critical and the sustainability of urban agriculture was influenced by them. The relationship between these variables must be in operation according to Human Ecology theory which gives a concision and elegance to the holistic perspective of urban agriculture as practiced by the urban dwellers in kakamega town .This reflects the adaptive nature of the urban dwellers through their use of knowledge and skills to produce food for themselves through innovation and new technologies. That Communication technology and transport were critical in the shaping of the human ecological system through the flow of ideas and goods thus supported UA in kakamega town. All these have influenced how people use their capacities, use social capital, and access the resources and the participation of the various stakeholders in UA for its sustainability in kakamega town.

2.9 Conceptual framework.

The conceptual framework indicates the following variables which will be measured against sustainable development of the urban dwellers as the dependent variable

Figure 1.conceptual framework

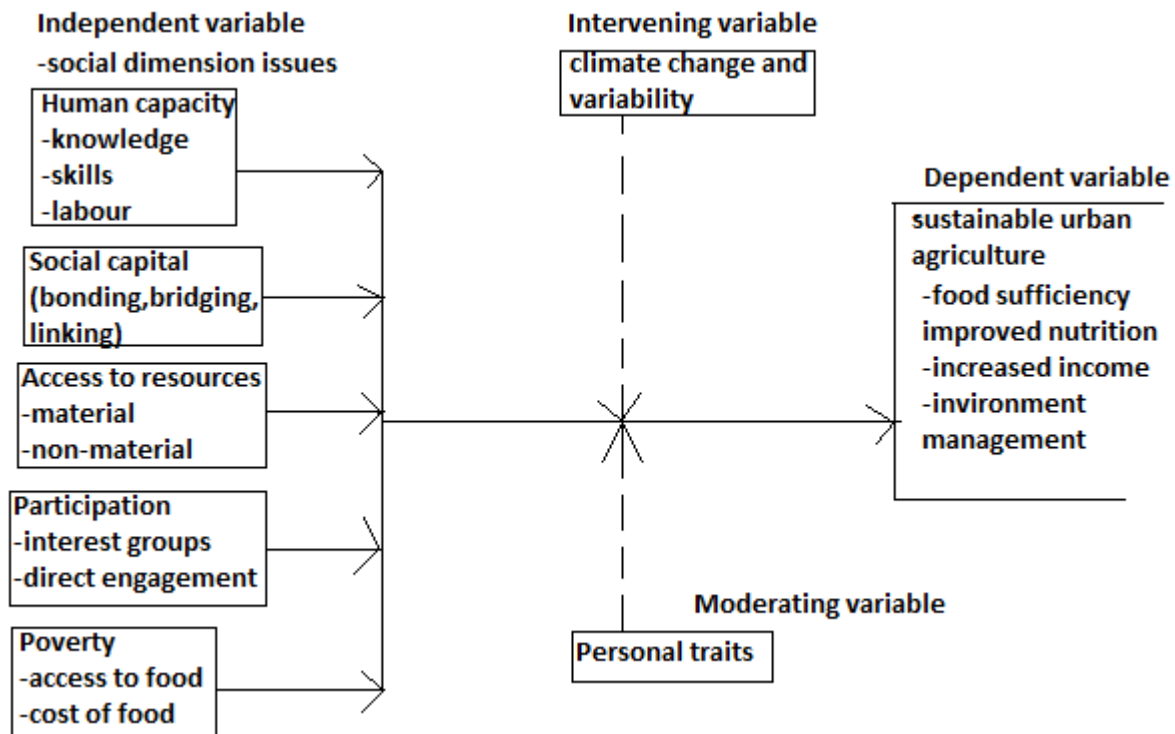


Figure 1 shows the way the social dimension issues of the urban dwellers (independent variables) relate with dependent variable, sustainability of urban agriculture in Kakamega town.

Human capacity of the urban dwellers as an independent variable looks at knowledge, skills and labor for sustainability UA in Kakamega town. Social capital as an independent variable focuses on social network between family members, inter-households. Access to resource such as material (land, water) and non material (socio-technical advice, funds) .Participation captures interest groups and direct engagement for sustainability of urban agriculture. The variable on poverty considers the aspects of access to food, adequacy and conditions for its production. The

performance indicators are: food sufficiency, improved nutrition, increased income, environmental management.

2.10 Summary of literature review

From the literature reviewed, it is evident that social sustainability is both an issue of policy and practice all over the world. All the nations globally experience same social challenges though with variations as mention in the discourse about United States of America, Britain, Germany, and locally in Africa countries like Nigeria, South Africa and the East African nations: Uganda, Tanzania and Kenya.

Human capacities, social capacity, access to resources and participation of urban farmers were critical in sustainability of urban agriculture. Similarly their social status such as poverty, defines their extent of involvement in an activity. Social change in developing countries will be achieved if these factors are institutionalized and supported at local level institutions. As such, the potential of human capital in the masses and social capital is never fully utilized.

2.11. Research Gaps

The study aimed at amplifying the fact that sustainability of urban agriculture depended on social sustainability of the urban farmers. This required linking information about the opportunities presented by human capacity, social capacity, access to resources, participation and poverty on sustainability of urban agriculture. To explore production systems that would lead to food policy safety standards basing on developed human capital in urban food system.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter will cover research methodology under the following topics, research design, target population, sample size and sampling procedure, methods of data collection, validity and reliability of the instruments, operation definition of variables and the techniques of data analysis.

3.2 Research design

The study employed the descriptive survey research design. This involved collection of data from a number of populations in order to determine current status of the population with respect to one or more variables (Kombo & Tromp 2006).

Survey research encompassed any measurement procedure that involved asking questions to the respondents. Ngaira and Walingo (2008) put it as self report assessment. It was to help explain and explore the status of two or more variables at a given time, in this study the researcher intended to survey the urban settlements and gather information from the urban farmers.

3.3 Target population

Population was defined as an entire group of individual's, events or objects having a common observable characteristic or from which samples were taken for measurement. Kakamega municipality has a population of 5238 farm families, (District statistics office, 2009).70% (3667) of these population actively engaged in small scale subsistence agriculture, 5% (262) are commercial farmers and the rest to some significant level practiced both types.

The table below shows various activities of the urban farm households and their distribution according to the type, population in the sample frame and the population in the sample.

Table 3.1 Sample frame for urban farm families

stratum	Number(%)in sample frame	Number(%)in sample
Commercial farmers		
Dairy cows(exotic)	113(2.16)	30(8.3)
Poultry(exotic, locals)	97(1.85)	30(8.3)
Fish farming	50(0.95)	25(6.92)
Bee keeping	24(0.46)	20(5.54)
Horticulture(green house)	32(0.61)	25(6.92)
Horticulture (open field)	124(2.37)	30(8.3)
Other projects	27(0.52)	20(5.5)
Total	467(8.9)	180(49.9)
Subsistent farmers		
Dairy goats	15(0.29)	10(2.78)
Dairy cows(local)	449(8.6)	10(2.78)
Poultry(exotic, local)	900(17.2)	20(5.54)
Horticulture (open field)	2300(43.9)	70(19.4)
Other agricultural projects	1544(29.5)	70(19.4)
Total	4771(91.1)	180(49.9)
Grand Total	5238(100)	361(100)

The sample frame was designed to capture most farm families in the municipality of 5238 (District statistics office, 2009).The sample frame included as many entries of all farm activities as possible. The samples for commercial projects were oversampled to increase the precision of estimator of the variable.

3.4 Sample size.

A sample was the subset of the population involved in a study, part of the population.

Mbwesa (2006) states as a representative of the population in a research study. Sampling was careful selection of a population that fit the study criteria (Ngaira and Walingo 2008). The sample size used was 361 urban farmers, according to Krejce & Morgan (1970), Research Advisor (2006), for a population of 5238 urban farm households.

Table 3.2 Actual samples reached

Respondents	Total sample	Actual sample	percent
Urban farmers	361	233	64.5
Social/development workers	5	5	100
Total	366	238	65.0%

Table 3.2 shows the actual sample reached by the researcher and the assistants a social worker and an extension officer working within their focal points. There were, 65.3 % (233 out of 361) urban farmers and 100% (5 out of 5) of social worker who were reached in the research.

3.5 Sampling procedures

According to Kothari (2004) an appropriate sampling technique is used when the entire population would be unmanageable. The study population was divided into 10 clusters according to the estates in the municipality. For each estate, several blocks of houses were identified and 20 households of urban farmers randomly selected, and a member interviewed while others completed questionnaires. To include more farmers in the study six field days during the period of study were attended; questionnaires were administered to farmers and others interviewed. The data was categorized to ensure that the information about a variable obtained was more precise. This raised the precision of estimator of a variable for the whole population. Purposive sampling (non-random) was employed on 5 social workers/extension workers and 20 urban farmers.

Deming (1990) indicates that this design was important as it targeted respondents believed to hold reliable information for the study such as the social and extension workers charged with the social development programs and socio-technical assistance to the people.

3.5 Research Instrument

Research instruments are techniques or tools used to collect data, Mbwesa (2006). The study used a questionnaire, an in-depth interview and informal site observation. The study adopted data triangulation by using a combination of data sources; primary data by interview of respondents (farmers, extension officers, social workers), visit to some projects to observe and use of questionnaires while incorporating secondary data from kakamega district agricultural annual reports ,monthly reports, journals; such that the strength and weakness in each source are compensated when used together. Interviews and observations were used after questionnaires had been administered. This was to help clarify and fill in possible gaps in the completed questionnaires for the primary data but mostly to achieve convergence of information.

3.5.1 Pilot Testing

Piloting was conducted to check for validity and reliability of the research instrument. It involved 20 individuals from the various settlements. Piloting involved drawing subjects from the target population and stimulating the procedures and the protocols that had been designed for data collection. A likert scale, open ended questions were incorporated in the questionnaire after pilot testing such that the results were not captured in two groups of YES and NO, hence no substantial conclusion could be made.

3.5.2 Validity of data collection instruments

Validity refers to the degree to which a method, a test or a research tool actually measures what it's supposed to measure. According to Ngaira and Walingo (2008), validity considers whether data obtained in a study represents the variables of the study. Validity was achieved using a number of tools: questionnaire, interviews and site observation in the study. These instruments were used to add rigor, breadth and depth in the investigation. Predictive validity used to ascertain the way the tools theoretically predicted the content of study.

3.5.3 Reliability of data collection instruments

Reliability was the judgment of the extent to which a test, a method or a tool gives consistent results across a range of settings and if used by many researcher. Le Compte and Preissle (1992) describe reliability as the extent to which studies could be replicated and assumed that a research using the same methods could obtain the same results as those of prior study. In the study a test-retest approach was used when data from two consecutive field days (14 days apart) were compared and reliability coefficient of 0.79 obtained. This was acceptable as it was above 0.7 thresholds recommended by Sekaran (2003). Similarly the internal consistency reliability was done on the set of questions set to determine the way they subjects responded.

3.6 Data collection procedures

A letter was presented to the department of social services at the district headquarters. This was after getting a permit from the National Council for Science and Technology and with the clearance from the University of Nairobi to do research. Three sets of instruments were used to collect data from the sampled population. The first set of questionnaires were administered to five staff in the department of social services and agriculture and 361 individuals from the

clusters of the 10 estates and during the various field days' within the 12 weeks of research . The second set of instrument was an in-depth interview for the urban farmers with guide from the social and extension workers in their focus areas. The other instrument to collect information was the direct informal observation of the urban farmers within their natural settings of most projects to complement the above two instruments.

3.7 Data analysis techniques

Data analysis refers to a variety of activities and processes that a researcher administers to make certain decision regarding the data collected from the field Mbwesa (2009) .It was also the process of inspecting ,cleaning , transforming and modeling data with a goal of highlighting useful information that supports decision making (Rodgers and Hrovat 1997).According to Bryman and Cramer (1997) ,data analysis seeks to fulfill research objectives and provide answers to research questions .The study applied both qualitative and quantitative approaches. Quantitative data processing and analysis involved editing of the questionnaires to minimize errors; this was to ensure completeness and consistency followed by coding the open ended data entry.

The data was logged according to the number of different sources at different times. This was followed by converting data into variables that were usable in the analysis. The results were interpreted and displayed in a systematic manner as frequency distribution and percentages, from which a meaningful report was derived. Spearman rank correlation was used to investigate the relationship between the strata in the light of the variables, a value of $r > 0.6$ preferred for a strong relation according to Yunker *et al* (1994).Qualitative data was analyzed and interpreted by organizing data into the five key areas as highlighted by the objectives of this study.

3.8 Operation definition of variables

A variable is an empirical property that can take two or more values. According to Kombo and Tromp (2006), variables are attributes or qualities of the case that is measured or recorded. Any property that can change, either in quantity or quality is regarded as a variable. In this study the variables are human capacity, social capital, and access to resources, participation and poverty of the urban dwellers are to be investigated if they influence the sustainability of UA in Kakamega town.

Objective Research question	Variable	Type of information	Data collection instruments	scale	Data analysis
What is the influence of capacities of urban dwellers on sustainability of urban agriculture	Independent capacities	Knowledge Skills labor	Questionnaire	Ordinal scale	Descriptive analysis
	Dependent	Type and size of UA project	Questionnaire	Ordinal scale	Descriptive analysis
To what extent does social capital among urban dwellers influence sustainability of urban agriculture	Independent Social capital	Bonding Bridging linking	Questionnaire	Ordinal scale	Descriptive analysis
	Dependent	A variety of activities	Questionnaire	Ordinal scale	Descriptive analysis

How does access to resources by urban dwellers influence on sustainability of urban agriculture	Independent	Access to resources -Land -Water - Credit/funds -Socio-technical	Questionnaire	Ordinal scale	Descriptive analysis
	Dependent	Type and Size of UA projects	questionnaire	ordinal scale	Descriptive analysis
What is the influence of participation by urban dwellers on sustainability of urban agriculture	Independent	participation -Interest groups -Direct engagement	questionnaire	ordinal	Descriptive analysis
	Dependent	Function of UA projects	Questionnaire	Ordinal scale	Descriptive analysis
What is the influence of poverty on sustainability of urban agriculture	Independent	Poverty Cost of food Access to food	Questionnaire	Ordinal scale	Descriptive analysis
	Dependent	Access to factor of production	Questionnaire	Ordinal scale	Descriptive analysis

CHAPTER FOUR

DATA, ANALYSIS, PRESENTATION AND INTERPRETATION OF RESULTS.

4.1 Introduction

This chapter presents data analysis, presentation and interpretation of results based on the response rate of the study, demographic characteristics of the respondents, and human capacity indicators by the urban farmers, social capital indicators by the urban farmers, access to resources indicators, participation indicators by urban farmers and poverty on sustainability of urban agriculture. This data was collected by the researcher and two assistants -social worker and extension workers by directly administered questionnaires and interviewed urban farmers.

4.2 Response return rate

The numbers of dispatched questionnaires was 400 for urban farmers and 5 social workers. But those who participated by returning the completed questionnaire were as shown in table 4.1

Table 4.1 Questionnaire response rate

category	Sample	Returned	Percentage
Urban farmers	361	233	65.4%
Social workers	5	5	100.0
Total	366	238	65.0%

Table 4.1 shows that 65.4% (233 out of 361) urban farmers targeted for the study and questionnaires were administered to them responded. Then all the sampled social workers, 100% (5 out of 5) responded by completing the questionnaires that were administered. A total response rate of 65.0% (238 out of 366) of the sample was achieved and attributed to longer time the researcher, the assistance interacted with the farmers. Therefore conclusions were drawn from this sample 65% (238 out of 366) of the respondents. Nassuima (2000) asserts that in

survey research, a coefficient of variation of 30% and a standard error of 5% from a sample were acceptable, thus 65% of the sample of the research exceeded the required threshold.

4.2 Demographic characteristics of the respondents

The respondents were asked to state their gender and age to capture their demographic characteristics and their suitability in urban agriculture, the findings are illustrated in table 4.2

The urban farmers were asked to indicate their gender (sex) and their distribution in urban agriculture compared as summarized in table 4.2.

Table 4.2 Gender of the respondents

	Frequency	Percentage	Cumulative percent
Gender			
Male	110	46.1	46.1
female	128	53.9	100.0
Total	238	100.0	

Table 4.2 shows that 53.9% (128 out of 238) were female as compared to 46.1% (110 out of 238) male. This was linked to their high levels of empowerment and the willingness to appropriate the skills in urban agriculture. But men were thought to venture into other opportunities provided in the urban settings and not suited to the women because of the demand in skills and rigor.

The urban farmers were required to state their age and these values tabulated such that comparisons would be made from it in relation to sustainability of urban agriculture. The ages were capture in table 4.3

Table 4.3 Age of the respondents

Age	Frequency	Percentage
20----30	56	23.7
31----40	97	40.7
41----50	64	27.0
51 and above	31	8.6
Total	238	100.0

Table 4.3 shows 23.7% (56 out of 238) were aged 20—30, then 40.7% (97 out of 238) were aged 31---40, then 27% (64 out of 238) aged 41---50 and lastly 8.6% (31 out of 238) aged above 51 years. This was a more youthful population of ages between 20 and 40, (64.4%) and significant ageing population in urban agriculture. The young populace was thought to possess relevant knowledge, skills and adaptable to new practices from research, media and socio-technical assistance. The aged group found it as a means of livelihood and reduced levels vulnerability.

4.3 Human Capacity and sustainability of urban agriculture

The study sought to determine the influence of capacities on sustainability of urban agriculture using indicators such as: use of local knowledge, the availability of relevant skills and labor practiced. The urban farmers were asked about the influence of local knowledge on sustainability of urban agriculture using output of produce, market acceptability of the produce and market chain development as indicators. The findings were as shown in table 4.4

Table 4.4 Local knowledge on sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Local knowledge	commercial	138	121	88.0
	subsistence	100	74	74.0
Total		238	195	81.9

Table 4.4 shows that 81.9% (195 out of 238) respondent; 88% of commercial farmers (121 out of 138) and 74% of subsistent farmers (74 out of 100), affirmed use of local knowledge. This was in the actual farming: in plant and animal husbandry, adaptability to innovation and technologies. But commercial farmers had a high value by 14%; as seen in shift from traditional farming methods , scaling up produce, aggregation of produce, differentiation, integration of plants, value addition to produce ,eco-cycle and forms of conservation agriculture .All these enhanced output and the returns than for subsistent farmers.

The urban farmers were required to indicate the contribution of availability of skills (relevant) on sustainability of urban agriculture. The performance indicators were output of individual agricultural projects, maximization on market prices, employability of laborer and eco-cycle. The finding are shown in table 4.5

Table 4.5 Skills on sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
skills	-commercial	138	103	75
	-subsistent	100	60	60
Total		238	163	68.5

Table 4.5 shows that 68.5% (163 out of 238) respondents, 75% (103 out 138) for commercial farmers and,60% (60 out of 100) of subsistent farmers confirmed that skills in urban agriculture were relevant. The skills in animal production were such as rearing of exotic breeds (dairy animals, poultry (broilers, kenbros, layers) alongside the local breeds for the strata. In plant husbandry the skills were production in ‘bag gardens, kitchen gardens, greenhouses and farms on houses. Commercial farmers showed advanced practices up by 15% than subsistent farmers, in life cycle of produce in market chain development, storage, packaging and planning of resources/ activities.

The study sought to know how availability of labor influenced urban agriculture. The urban farmers were to highlight about type and the nature of labor commonly used, its connection with output and viability of urban agriculture projects. The results were as captured in table 4.6

Table 4.6 Availability of labor on sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Labor availability	commercial	138	104	76
	subsistent	100	72	72
Total		238	176	73.9

Table 4.6 shows availability of labor at 73.9% (176 out of 238) respondents; commercial farmers at 76% (104 out of 138) and 72% (72 out of 100) for subsistent farmers. For both commercial farmers and subsistent farmers it was the measure of intensity of application of developed skills and knowledge in enhancing production but slightly higher for commercial farmers by 4% and linked to desire to produce more.

The study was to determine the type of labor practiced and its influence on sustainability of urban agriculture. The urban farmers were required to state whether it was permanent or not and the findings were summarized in table 4.7

Table 4.7 Type of labor practiced on sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Labor permanent	commercial	138	105	76
	subsistent	100	72	72
Total		238	177	74.4

Table 4.7 shows that permanent labor at 74.4 % (177 out of 238); 76% (105 out of 138) for commercial farmers and 72% (72 out of 100) was practiced and vital in sustained performance of urban agriculture. The type of labor was limited by size of projects and due to migration pattern of people. This meant fewer permanent employees and for commercial farmers it was higher by 4%; however family labor or casual labor was commonly used for both groups.

The study sought to investigate the use of child/elderly labor and sustainability of urban agriculture. The urban farmers were required to report about the number of times, the number of children /elderly used on their farms as source of labor (both within family or outside family bracket).The results were as captured in table 4.8

Table 4.8 use of child/elderly labor and sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Use of child/ Elderly labor	commercial	138	48	35
	subsistent	100	70	70
Total		238	118	49.6

Table 4.8 shows that use of child labor/elderly labor at 49.6 % (118 out of 238); 35% (48 out of 138) for commercial farmers and 70% (70 out of 100) for subsistent farmers in urban agriculture. The rate was higher for subsistent farmers by 35% and linked to higher levels of poverty, unemployment and lack of food hence labor for food was practiced. The elderly labor was majorly linked to land owners who took up urban agriculture for sustenance and reduced dependency. A Pearson correlation (two-tailed) on capacities between the commercial and subsistent farmers on sustainability on urban agriculture after analysis was found to be a positive correlation of 0.862; hence the study concluded that developed human capacities strongly influenced urban agriculture.

4.4 social capital and sustainability of urban agriculture

The study sought to determine the influence of social capital on sustainability of urban agriculture and used social network in a household and inter-household as an indicator. The response was as shown in table 4.9

Table 4.9 social network and sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Social network	commercial	138	108	78
	subsistent	100	65	65
Total		238	173	72.7

Table 4.9 shows that social network at 72.7% (173 out of 238); 78 % (108 out of 138) and 65% (65 out of 100) affirmed their membership and working in social network in urban agriculture. Commercial farmers had a higher response by 13% and training, management of conflicts, labor, market opportunities, scaling, aggregation of the products and group based projects were identified as key areas where social capital played a crucial role than in subsistent farming.

4.6 Access to resources and sustainability of urban agriculture

The study sought to find out how access to resources determined the performance of urban agriculture projects using parameters such as: access to land, access to clean water, access to credit and availability of socio-technical assistance.

The farmers were asked about the influence of accessibility of land and sustainability of urban agriculture and indicators such as output, size of land, tenure and locality .The findings were summed up in table 4.10

Table 4.10 Access to land and sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Access to land	commercial	138	112	81
	subsistent	100	84	84
Total		238	196	82.4

Table 4.10 shows that majority of urban farmers at 82.4% (196 out of 238); 81% (112 out of 138) commercial farmers and 84 % (84 out of 100) subsistent farmers indicated that access to land contributed to output in urban farming. The subsistent farmers had a higher percent by 3% linked to lack of land tenure and lower production capacity compared to commercial farmers who had capital intensive project on small holdings.

The study also sought to establish the influence of access to water and sustainability of urban agriculture. This captured areas when water usage was critical and distribution between the strata, the results were as recorded in table 4.11

Table 4.11 Access to water and sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Access to water	commercial	138	117	85
	subsistent	100	70	70
Total		238	187	78.6

Table 4.11 shows that 78.7% (187 out of 238); 85% (117 out of 138) commercial farmers and 70% (70 out of 100) subsistent farmers indicated that access to clean water was critical in urban agriculture. Commercial farmers had a higher response by 15%, this was linked to the unique demands of their individual projects such as exotic poultry production, dairy farming, irrigation and fish farming for sustained production.

The study sought to establish the influence of access to credit and sustainability of urban agriculture. The farmers were to state the type of credit available for the strata and its contribution to performance of urban agriculture. The results were summarized in table 4.12

Table 4.12 Access to credit and sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Access to credit	commercial	138	121	88
	subsistent	100	75	75
Total		238	196	82.4

Table 4.12 shows that 83.6% (196 out of 238); 88% (124 out of 138) commercial farmers and 75% (75 out of 100) subsistent farmers affirmed that access to credit influenced performance of agricultural projects with equity at 100% as the major source. Commercial farmers' percent was

higher by 13%; showed the intensity in the sense of innovation and technological development to drive production.

The study sought to investigate the influence of access to socio-technical support and sustainability of urban agriculture. The indicators were the number of times the farmers received and adequacy of socio-technical support. The results were recorded in table 4.13

Table 4.13 Access to socio-technical support on sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Access to socio-	commercial	138	120	87
Technical services	subsistent	100	81	81
Total		238	201	84.5

Table 4.13 shows that 84.5% (201 out of 238); 87 % (120 out of 138) for commercial farmers and 81% (81 out of 100) subsistent farmers affirmed access to socio- technical support quite often. The commercial farmers had a higher percent by 6% than subsistent farmers and linked to opportunity to produce more and minimize the risks in their capital intensive of the projects.

In summary when the variable on access to resources was further analyzed it was found to have a positive correlation of 0.543, hence the study concluded that there was weak correction between access to resources and sustainability of urban agriculture among the farmers.

4.7 Participation and sustainability of urban agriculture

The study sought to determine how the participation of the stakeholders sustained urban agriculture. The urban farmers were asked about the roles of self interest groups in the sustainability of urban agriculture and results were as recorded in table 4.14

Table 4.14 Interest groups and sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Interest groups	commercial	138	124	90
	subsistent	100	60	60
Total		238	184	77.3

Table 4.14 shows that 77.3 % (184 out of 238); 90% (124 out of 138) for commercial farmers and 60 % (60 out of 100) for subsistent farmers indicated that interest groups were part of well functioning urban agriculture . The roles were more pronounced for commercial farmers by 30 % than the subsistent farmers because of the higher risks in the projects. The areas of focus majorly were tenure, market and storage facilities, safety of workers and consumers.

The study also sought to establish how direct engagement by various players sustained urban agriculture. The farmers were required to identify other players in urban agriculture, their roles and results were as recorded in table 4.15.

Table 4.15 direct engagement and sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Direct engagement	commercial	138	117	85
	subsistent	100	73	73
Total		238	190	79.8

Table 4.15 shows that 79.8% (190 out of 238); 85% (117 out of 138) commercial farmers and 73 % (73 out of 100) subsistent farmers confirmed the direct involvement by various stakeholders in performance of urban agriculture. It was in form of financial support and management of sponsored projects, innovation from research, market value and chain development. This was high for the commercial farmers by 12% than subsistent farmers because of risk levels, nature of involvement (interest), quantities and quality of produce and the intensity of market value chain development.

4.8 Poverty and sustainability of urban agriculture

The study sought to determine the influence of poverty on the sustainability of urban agriculture projects. The respondents were asked about the cost of food stuffs and access to the food from urban agriculture.

Table 4.16 food sufficiency and sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Food sufficiency	commercial	138	130	94.3
	subsistent	100	73	73
Total		238	203	85.2

Table 4.16 shows that 85.2% (203 out of 238); 94.3 % (130 out of 138) commercial farmers and 73% (73 out of 100) subsistent farmers indicated their ability to access food from urban agriculture. This was 21.3% higher for the commercial farmers and attributed to the intensity of activities that drive production and created surplus. While for the subsistent farmers it was low and attributed to limited factors of production: land, water and credit and relevant knowledge.

Table 4.17 food cost /access and sustainability of urban agriculture

subtheme	Category	Sample	Respondents	percent
Food access/cost	commercial	138	128	93
	subsistent	100	46	46.3
Total		238	174	73.1

Table 4.17 shows that 73.1% (174 out of 238); 93 % (128 out of 138) commercial farmers and 46.3% (46 out of 100) subsistent farmer indicated their ability to access food produced in urban agriculture. The commercial farmers had a higher value by 46.7%; an indicator of surplus from their projects unlike the subsistent farmers.

4.9 Qualitative data analysis

This was based on the key informant interviewed. The social workers working in the municipality indicated that social dimension issues; human capital, social capital, access to resources, participation and poverty were addressed through projects such as urban agriculture. The push for urban agriculture was both as a crisis strategy to sustain livelihoods and as a major agro-based industry with agro-based exports that drive social development. Similarly the extension officers affirmed that the demand for urban agriculture was high, with a potential of 1.8 million liters of milk per year for dairy farmers, 180 tonnes in horticulture and employability of over 10,000 persons (kakamega central, Sub-county agricultural office, 2013). The dynamic nature of the urban setting influenced commercial farming and subsistent farming; practiced on any available open spaces in kakamega town out of 36 km² area of arable land in kakamega municipality Division.

The ecosystem services in urban areas were often underpinned by biodiversity, sustainable management of these natural resources required integrated conservation needs and development priorities. Land, water and human capital were units of production and defined performance of urban agriculture. Access to socio-technical resources enhanced entitlement to units of production in urban agriculture such as legal issues, finances, markets and safety standards for sustainable food system.

The social sustainability of people; built knowledge influenced their choices and practices in urban agriculture. The developed knowledge and skills practiced are: climate smart agriculture, conservation agriculture, eco-cycle, differentiation and specialization in urban agriculture determined extent of organization of resources (technologies) available for production and consumption. The fluxes of information and continual human resource development bridged opportunities to be exploited in urban agriculture; driving sustainable development. The labor practiced such as elderly labor, child labor mostly in female-headed families and child-headed families was counter social sustainability hence need of safety nets.

The social networks were critical in group based farming, training of urban farmers, scaling and aggregation of most of the products in urban agriculture. This social institution created agro-economical landscape that contributed to healthy food system. They were contact point for all the stakeholders and reduced conflicts in the exploitation of the available resources among the urban farmers. The stakeholders were such as financiers, researchers, educational institutions and introduction of innovation in established projects.

The use of solid wastes as manure, waste water for irrigation a demonstrated skills in eco-cycle and environmental management .But the risks of soil contamination was as a result of solid wastes, industrial chemicals and corrosion of built up environment(iron sheets, paints),these affected the quality of agricultural products. The awareness about the risk by farmers, workers and consumers was limited. There was lack of proper policy to safeguard the safety of workers (child labor, elderly labor), consumers and food safety.

Participation by all stakeholders highlighted conditions of production and advocated on the issues of land tenure for the poor, security, financial opportunities and market chain development. Research institutions such as KARI introduced new technological findings. The NGOs; One acre fund funded and promoted planting of maize, Technosaf dealt with local poultry production. The ministry of agriculture involved in certain value chain addition in poultry and dairy through projects such as ASDS and KAPAP to improve on profitability. Other projects included Piga Njaa Marufuku, financial support to 10 groups to a tune of 1.2 million, grant dairy co-operative at 2 million to improve their capacity in active participation in urban agriculture within kakamega town.

Among the poor issues of land tenure, eviction and violation of urban by-laws came into play. These hindered their involvement in production, created vulnerability and failure to exploit these massive potential available. The possibility of raising exchange between food adequacy, surplus and deficit remained a challenge. The respondents who were unable to access sufficient food supplies due to the cost and lack of means of production were 30.7% (33 out of 112). The social dimension issues provided a link between the opportunity for food adequacy and surplus against deficit but geared to well-being of the urban dwellers revealed the complex scenarios of urban environment and urban agriculture. The practice of urban agriculture with modern technologies and innovation will reduce the cost of per capita food production, enhanced asset accumulation, environmental management and lead to local development. But the risk of contamination of crops with pathogens, heavy metals and transmission of diseases (zoonosis) from domestic animals remains a challenge and concern for SLCA in safeguarding the well-being of people.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter covers a summary of the findings of the study as well as discussions and conclusions based on these findings. The chapter also has recommendations based on these findings.

5.2 Summary of findings

All the sampled respondents include 356 urban farmers and 5 social workers, 65.4% (233 out of 356) and all the social workers participated by returning the questionnaire. There were more women than men participating. The mean age of participating urban farmers was 37 years, youthful and energetic and mostly found within Milimani, Amalemba and Lurambi estates.

The study established that most urban farmers affirmed that basic knowledge at 81.3% (193 out of 238), vast skills at 67.3% (160 out of 238) and labor at 73.4% (174 out of 238) respondents were required for sustainability of urban agriculture. Local knowledge was demonstrated in actual farming, eco-cycle, adaptability to innovation and technologies and higher for commercial farmers by 14%. In both strata skills were required for proper animal and plant husbandry but slightly higher by 15% for commercial farmers. The labor practiced was a measure of intensity of application of skills and knowledge in enhancing production. The type labor was both permanent, temporary; child labor and elderly labor were evident. Thus knowledge, skills and labor were human capacities critical for sustainability of urban agriculture.

The study established that most urban farmers were actively involved in social networks, 72.7% (173 out of 238) at all levels. But the commercial farmers had a higher percent by 13% and the key areas highlighted were in training, management of conflicts, labor, market opportunities, scaling

and aggregation. Increased social interaction influenced the success of urban agriculture enterprises, maximization of labor and increased opportunities through decision making and training. This enhanced production and also minimized conflicts that would arise over limited resources

The study established that access to resources was a direct contributor to sustainability of urban agriculture. Access to land at 82.4% (196 of 238), availability of clean water at 78.7 % , (187 out 238) , access to credit.83.6 %,(199 out of 238) and Socio-technical support at 84.5% (201 out of 233) positively enhanced performance of urban agriculture .But the response was higher for the commercial farmers and associated with production demands of individual projects. The resources were the actual units determining production.

The study brought to light the fact that participation by various stakeholders sustained urban agriculture; enhanced aspect of initiative, strengthened skills and capacities of urban dwellers. The stakeholders were urban farmers, society, interest groups and direct engagement by social institutions (NGOs, research, academic, marketing institutions). Interest groups involvement at 77.3%(184 out of 238) and direct engagement at 79.8%(190 out of 238), were critical in advocating for environment management, use of waste water, soil contamination, safety and advanced issues on storage, market chain development, human capital development and access to resources.

The study sought to determine the way poverty influenced sustainability of urban agriculture. It was found that food sufficiency was at 85.2 % (203 out of 238) while food access was at 73.1 % (174 out of 238) for the urban farmers. But for the commercial farmers the values were higher by

46.7% and 21.3% for food sufficient and access; this was linked to the surplus that resulted from their projects.

5.3 Discussion of findings

The drivers of sustainability of urban agriculture were readily available in kakamega town and among the residents. Social dimension issues of urban dwellers were pathways to sustainability of urban agriculture as shown by the findings. They were a measure of opportunity and quality of decision making in urban agriculture for the urban farmers. This showed that the social dimensional issues related to social sustainability have always influenced urban agriculture.

The influence of human capacity of urban farmers on sustainability of urban agriculture in kakamega town was researched on. It was established that majority of the urban farmers were endowed with knowledge, skills and labor that were vital for performance of urban agriculture. These enhanced their innovative practices, adaptability to research and market chain development of their products contributing to sustainability of UA. This was in agreement with the findings of Schulz (2012) in the United States of America, which showed that Skills and education at all levels led to productive growth and rising living standards. This was critical to the practitioners and they were sustained through training, media, research institutions, agricultural publications, social contact, and government policy but accelerated by transport and communication network in towns. But labor practice among the urban farmers was critical. The research established that labor practiced was limited to availability, cost, social demand and capability (skills and knowledge) in the given activity. Child labor usage was common among the female headed households, the poor and child headed households. Women involvement was a show of level of empowerment. To the low income earners participation was due to lack of

skills relevant to formal sector. The elderly labor was common among the retirees and local indigenous owners of settlements in town; to improved access to food and employment that reduced vulnerability. This was in line with findings of Mpofu (2013) citing Mohammed (2002), that involvement of the elderly accommodating nature of urban agriculture. The labor market was influenced by demographic changes and education process. However they were affected by migration patterns and flow of information as more of such children and women were in urban agriculture than men.

Most urban farmers were actively involved in social networks, 72.7% (173 out 238) at all levels. At family level the bridging social network shaped the co-coordination of activities in urban agriculture and utilization of the scare resources such as labor, land and water .On the other hand at inter –family level it helped in training, management of conflicts, labor, market opportunities, scaling and aggregation in the production in urban agriculture projects. Increased social interaction influenced the success of enterprises, maximization of labor and increased opportunities through decision making and choice. Thus social networks created entitlement even where resources such as land, water and human capacities were limited.

The study established that access to resources: material resources such as land, water and credit were active ingredients in sustainability of urban agriculture. The three (lands, water and credit) alongside human capital were factors of production in urban agriculture. Unfortunately these faced a challenge with the dynamics of the urban environment such as urban sprawl and competition over the factors of production. Socio-technical assistance was critical in production,

training, scaling, and aggregation of most products, financial opportunities, legal advice and adaptation of new technologies.

Most urban farmers were involved as follows: interest groups at 77.3% and direct engagement at 79.8% in addressing access to resources such as land, credit, market facilities. Storage and environmental management issues were their focus. Those involved were research institutions, sales agents through outlets, shops, experts in field days, health practitioners, social workers /development worker and politicians. The working of all these groups was to reconnect people with their local food system, technology and guide safety in urban agriculture.

Studies showed that poverty in urban areas was a major reason for food insecurity and malnutrition in urban areas. They were accelerated by new patterns of social, economic opportunities and developmental priorities. The changing institution context of urban areas created persistent food insecurity, underpaid labor and migration that challenge the social costs and benefits; created social exclusion and lack of fit within the urban fabric. Most of the food consumed in cities was purchased and poor families spend more on food and still were food insecure. Others in urban agriculture were unable to access safe water, safe areas and better seeds for production. As such they were exposed to risks of contaminated soil, waste waters, zoonosis, chemical poisoning with all these affecting them. Therefore a need for intervention such subsidies, extension services, policies that guaranteed their access to factors of production were required.

The findings of the study would contribute to both theory and practice if adopted .In terms of theoretical contribution it would help the government understand the dynamics in agricultural industry and the social based variables which need to be strengthened as they show a strong influence on sustainability of urban agriculture. In practice it would help the social service providing ministries such as agriculture, social and health to borrow heavily from the findings of this study to guide in the development food safety standards within urban food system.

5.4 Conclusion

After thorough review of the summary of the findings under every sub theme, a systematic presentation of informed conclusion was made on every finding in order to locate a basis for valid recommendation for effective policy action meant to improve sustainability of urban agriculture projects in Kakamega town. Informed by the summary of the findings of the urban farmers, more women and a youthful population were engaged in urban agriculture. This was critical in sustainable development .The study established that skills, knowledge and labor were critical in urban agriculture. The represented developed human capital that encouraged participation and reduce vulnerability levels for food access, adequacy, tenancy, access to credit, and asset accumulation.

The study established that social network shaped the co-ordination of activities in urban agriculture and utilization of the scare resources (labor, land and water), training, management of conflicts, labor, market opportunities, scaling and aggregation in the production. Thus social networks created entitlement in decision making and access to resources; these were crucial in both individual, group-based projects and community supported agricultural projects.

The findings also showed that access to both material and non-material resources by urban farmers improved the performance of urban agriculture. These were units of production such as land, water, credit options and socio-technical assistance. They determined the scope and risk of involvement by the urban farmers; the entitlement to such was critical to sustainability of urban agriculture. However the challenge of contaminated soils and waste water affected the quality of life of people, social life cycle assessment (SLCA) of urban agriculture remains critical for its sustainability.

The study established that self interest groups and the direct engagement by NGOs, research institution had a positive contribution on sustainability of UA. These catalyzed development and strengthening of skills and capacities by training, access to resources (funds, seeds, water), legal provision, market chain development and co-management. There was need to put strategies in place to bridge communication gap between opportunities presented and potential output in urban agriculture activities such as innovations, technologies and market chain development.

The study established that poverty led to food insecurity and malnutrition in urban areas. Therefore a need for interventions such subsidies, extension services, policies that guarantee their access to factors of production were required. This will be critical in their involvement in urban food system, safeguarding their well-being and enhance asset accumulation as part of development.

The project has demonstrated that it was possible to devise a measurement to attest to quality of life and the strength of communities in urban agriculture .This implies that the idea of social

sustainability is important to both the government and the society. There is a great wealth of data providing such a rich picture about stakeholders' experience in urban agriculture. Understanding the social dimension of urban agriculture in a locality was critical as it identifies areas in the life cycle of a product that require reinforcement in case of positive effects while negative impacts are mitigated. Those that are reinforced are such as use of social networks, technology and innovations from research, while the negative ones such a labor issues, health concerns and environmental issues are mitigated. Practice of UA was critical as it contributed to the understanding of social sustainability, than just a shift from use of available space, economic viability and environmental issues.

5.5 Recommendation of the study

There is need to enhance socio-technical support in communication between the urban farmers and government through relevant departments, research, academic institutions and NGOs. This will enhance flow of information critical in food policy and safety standards within the local community food system development. The government at all levels through legislature to incorporate urban agriculture in its urban planning, utilize the undeveloped spaces, managing the green environment, adoption of new technologies for increased food production. To develop maps for available spaces “zones” for urban development and urban agriculture that would support community supported agriculture as a targeted project. This iteratively will lead to a measure of the transformation of the society as viewed alongside others.

5.6 Contribution to knowledge

In a bid to investigate the influence of social dimension issues of urban farmers on sustainability of UA in kakamega town, the study made this contribution to knowledge that existed.

Table 5.6: The study contribution to knowledge

Research question	Contribution
What is the influence of capacities of urban farmers on sustainability of UA	The knowledge, skills and labor if constructively and purposively inputted into an UA activity will result into social change.
To what extent does social capital of urban farmers influence sustainability of UA	The study contributed to knowledge that most urban farmers operated in social networks to enhance entitlement to units of production and reduce cost.
How does access to resources by urban farmers influence the sustainability of UA	The study found out that access to resources; land, water, credit and socio-technical services influenced performance of UA projects, though limited. The study contributed to knowledge that policies that would promote access to land/space, clean water, credit for UA and socio-technical assistance were required for UA.
To what extent does participation by urban dwellers influence sustainability of UA	The study contributed to knowledge that the involvement of self interest groups, direct engagement by researchers, politicians, health and safety bodies in UA was to promote quality, viability of most UA projects and guide food policy and safety standards.
To what extent does poverty influence sustainability of UA	The study established that poverty inhibits sustainability of UA. There is need to create community –supported agriculture to enhance participation of the poor in UA and improve on their social sustainability.

5.7 Suggestions for further studies.

The study should be replicated in other urban centre's to assess the social dimension issues and sustainability of Urban Agriculture projects. There was need to encourage the youthful urban dwellers to venture in Urban Agriculture as a targeted project for improved food productivity, employment, use of new technologies, innovative practices to create wealth and local level development. Similarly explore social sustainability on viability of projects that take place in urban set up such as construction of roads, estates and institutions.

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APPENDICES

APPENDIX 1: INTRODUCTION LETTER

WEGULO M BERNARD,
P.O BOX 90.
KAKAMEGA.
19 .../03/2013

THE DISTRICT
DEPARTMENT SOCIAL SERVICES
KAKAMEGA CENTRAL DISTRICT.

KAKAMEGA.

RE: REQUEST TO CARRY OUT A RESEARCH IN YOUR AREA

I am a student at the University of Nairobi pursuing a master's degree in project planning and management. As part of my course am required to carry out research on influence of social dimension issues on sustainability of urban agriculture in Kakamega town.

I also have the pleasure to inform you that you are one of the respondents in this research. The researcher will maintain strict confidentiality and the identity of the participant will not be linked to the information received by the researcher.

Thank you in advance.

Yours faithfully,

Wegulo M.Bernard.

APPENDIX II TRANSMITTAL LETTER

WEGULO M. BERNARD,
P.O BOX 90.
KAKAMEGA.
TEL.0720 956 571.

TO,
ALL RESPONDENTS.

Dear Sir/Madam,

RE:REQUEST TO COMPLETE A RESEARCH QUESTIONNAIRE

I am a student pursuing a master's degree in project planning and management at the University of Nairobi. As a partial of fulfillment of the award of the degree, am expected to carry out a research study. My area of study is influence of social dimension issues on sustainability of urban agriculture in kakamega town.

I am kindly requesting you to complete this research questionnaire to enable me to complete my study. The information you shall give will not be used against the stated purpose nor will it be accessed by any other person but me, kindly be honest and co-operate in providing the information.

I highly appreciate and thank you in advance for giving you invaluable time to complete the questionnaire.

Yours faithfully,

.....

Wegulo M. Bernard

APPENDIX III

URBAN DWELLERS (FARMERS) QUESTIONNAIRE:

Questions on social dimension issues of urban dwellers on sustainability of urban agriculture in Kakamega town for those participating in urban agriculture

This questionnaire is being administered by a researcher, a master’s student at the University of Nairobi. The goal of the questionnaire is to collect information on social dimension issues of the urban dwellers on the sustainability of urban agriculture in Kakamega town.

PERSONAL DATA

1. Age [18 to 24] [25 to 30] [31 to 50] [above 51]

2. Gender [] female [] male

3. Marital status [] single [] married

4. What is the name of your locality?
.....

5. Level of education

 Primary []

 Secondary []

 Tertiary []

6. Are you aware of any forms of agriculture in your locality?

Yes []

NO []

7. If yes what forms of agriculture exist within your area?
.....

8. To what levels do the urban agriculture practitioners use their products?
.....

9. What are functions of urban agriculture in your neighborhood?.....
.....

SECTION B.INFORMATION ON CAPACITY, SOCIAL CAPITAL, ACCESS TO RESOURCES , PARTICIPATION AND POVERTY

	Strongly agree	agree	disagree	Strongly disagree
1.Individual knowledge influence production in agriculture projects				
2.Past experience in similar agriculture projects determines performance				
3.Relevant skills are vital in sustenance of agricultural projects				
4.				
5.Availability of labor enhances performance of agricultural projects				
6.Labour used in UA is permanent				
7.More women than men are source of labor UA				
8.Use of child labor is not common in UA				
9.The elderly are not involved in provision of labor UA				
10.Access to land determines performance UA projects				

11.Availability of water improves performance of UA projects				
12.Credit is easily available for UA practitioners				
13.Socio-technical assistance is unavailable to those practicing in UA projects				
14.Direct engagement by research institution improves UA projects				
15.Social networks among the stakeholders does not influence performance of UA projects.				
16.Self interest groups play a major role in the working of UA projects				
17. Politicians involvement in UA projects does not affect their viability.				

SECTION C: FURTHER INFORMATION ON CAPACITY, SCOCIAL CAPACITY, ACCESS TO RESOURCES, PARTICIPATION AND POVERTY

1. What are some of the skills required in UA projects?

.....

2.How are some of skill acquired ?

.....

3.what determines the type of labor practice in UA?

.....

4. Give reason for the answer in (3) above

.....

5. What are some of the sources of water used in UA projects?

.....

6. What are the sources of credit for UA projects?

APPENDIX III.

FIELD ASSISTANCE QUESTIONNAIRE

1. What is the potential of urban agriculture in kakamega?
2. What forms of urban agriculture are practiced in kakamega town?
3. How extensive is the urban agriculture practiced.
4. Are there programs initiated to support urban agriculture
by government?
by NGOs?
5. What factors are critical for productivity in urban agriculture.
6. Are there health risks associated with practice of urban agriculture?
7. How are these concerns addressed
8. Who /what are the drivers of urban agriculture.
9. How are these drivers sustained?
10. Would community supported agriculture be a viable venture for urban dwellers?

APPENDIX IV

SOCIAL WORKERS QUESTIONNAIRE

1. How relevant is urban agriculture to the department plan for social development?
2. What are some of the social attributes that driver urban agriculture?
3. Are there programs to sustain the factors mentioned above?
4. What are the major social concerns addressed by urban agriculture?
5. What are some of the risks anticipated in urban agriculture?
6. How are these risks managed?
7. Is there a policy that safeguards the wellbeing of urban dwellers in relation to products of urban agriculture.

APPENDIX V: A LETTER OF AUTHORIZATION FROM UNIVERSITY



UNIVERSITY OF NAIROBI
COLLEGE OF EDUCATION AND EXTERNAL STUDIES
SCHOOL OF CONTINUING AND DISTANCE EDUCATION
DEPARTMENT OF EXTRA-MURAL STUDIES
KAKAMEGA & WESTERN KENYA AREA

Your Ref:
Our Ref: Uon/Cees/Kak/1/47/(104)

P.O. Box 422
KAKAMEGA
KENYA

Telephone: Kakamega 056-31038

27th November, 2013

TO WHOM IT MAY CONCERN

REF: WEGULO BERNARD – L50/73146/2012

This is to confirm that the above named is a student at the University of Nairobi, College of Education and External Studies, School of Continuing and Distance Education, Department of Extra-Mural Studies, Kakamega Extra-Mural Centre taking a Course in Masters of Arts (Project Planning Management). He has completed his course work for Semester 1, 2 and 3 and he is working on his Project Paper.

He is undertaking a Research Project entitled "Influence of Social Dimension Issues on Sustainability of Urban Agriculture in Kakamega Town.

Any assistance accorded to him will be highly appreciated.

Yours faithfully,

A handwritten signature in black ink, appearing to read "Stephen Okelo".

Stephen Okelo,
Resident Lecturer,
Kakamega & Western Kenya Area.



APPENDIX VI. RESEARCH PERMIT



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 310571, 2219420
Fax: +254-20-318245, 318249
Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No.

Date:

10th February, 2014

NACOSTI/P/14/5770/472


Wegulo M. Bernard
University of Nairobi
P.O.Box 30197-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Influence of social dimension issues on sustainability of urban agriculture in Kakamega County,*" I am pleased to inform you that you have been authorized to undertake research in **Kakamega County** for a period ending **31st July, 2014.**

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

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


DR. M. K. RUGUTT, PhD, HSC.
DEPUTY COMMISSION SECRETARY
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Copy to:

The County Commissioner
The County Director of Education
Kakamega County.



APPENDIX IV:TABLE FOR SAMPLE SIZE

TABLE FOR DETERMINING SAMPLE SIZE FROM A GIVEN POPULATION

N	S	N	S	N	S	N	S	N	S
0	10	100	80	280	162	800	260	2800	338
5	14	110	86	290	165	850	265	3000	341
10	19	120	92	300	169	900	269	3500	246
15	24	130	97	320	175	950	274	4000	351
20	28	140	103	340	181	1000	278	4500	351
25	32	150	108	360	186	1100	285	5000	357
30	36	160	113	380	181	1200	291	6000	361
35	40	180	118	400	196	1300	297	7000	364
40	44	190	123	420	201	1400	302	8000	367
45	48	200	127	440	205	1500	306	9000	368
50	52	210	132	460	210	1600	310	10000	373
55	56	220	136	480	214	1700	313	15000	375
60	59	230	140	500	217	1800	317	20000	377
65	63	240	144	550	225	1900	320	30000	379
70	66	250	148	600	234	2000	322	40000	380
75	70	260	152	650	242	2200	327	50000	381
80	73	270	155	700	248	2400	331	75000	382
85	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
 "S" is sample size.

Krejcie, Robert V., Morgan, Daryle W., "Determining Sample Size for Research Activities", Educational and Psychological Measurement, 1970.