

**AN ASSESSMENT OF PLANNING INSTITUTIONAL FRAMEWORKS  
INFLUENCING URBAN AGRICULTURE IN THREE TOWNS OF WESTERN KENYA**

**BY  
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**DECLARATION**

I declare that this thesis is my original work and has not been previously published or presented for the award of a degree in any university

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## **DEDICATION**

This work is dedicated to my late mother, Mary Aoko Dawo, wife Vivian Anyango Otieno, my daughter Mary Kirsten and my two sons Bill and Griffin.

## ABSTRACT

Globally, urbanization and population increases have resulted into a reduction in arable land and increased food demand simultaneously. It is estimated that Africa will be 60% urbanized, while Kenya will be 46% urbanized by 2050. However, the current planning institutional framework does not effectively facilitate and regulate urban agriculture (UA). A planning institutional framework that effectively supports urban agriculture can play a major role in ensuring more food supply in urban areas. The study was conducted in rapidly growing medium-sized towns of Kisumu, Kakamega and Eldoret in Western Kenya. The purpose of the study was to assess the influence of planning institutional framework on urban agriculture in three towns in Western Kenya. The specific objectives were to: appraise the socio-economic and environmental status of urban agriculture; establish the effect of planning legislative framework on urban agriculture; and analyse the contribution of planning strategies, plans, and programmes to urban agriculture in the three towns in Western Kenya. Institutional, regulatory compliance, and general systems theories were used. A mixed-methods approach using concurrent triangulation research design was used on a target population of 440 urban farmers. Stratified random sampling technique was employed to obtain a sample size of 205 urban farmers, while 12 key informants and 24 discussants were sampled via a purposive technique. Interviews and observation were used as data collection methods, while data collection tools were an interview schedule, questionnaire, focus group discussion checklist, and observation schedules. Content and construct validity were tested with the help of experts as well as a pilot study conducted in Mbale, Vihiga town. Reliability of the questionnaires was determined at 0.7 and above using the Cronbach Alpha test. Results show that urban agriculture plays a progressive and critical socio-economic and environmental role in urban farmer households. The planning legislative framework affects urban agriculture unequally among the urban farmers in the three towns, and planning strategies, plans, and programmes do not contribute directly to urban agriculture except during spatial planning and drawing of residential plots, where some 10% of green space is often left in the plan for greenery or urban agriculture. Loglinear analysis revealed final models, after backward elimination, between variables of food nutrition and reuse of grey water (FN\*GW), food nutrition and poultry keeping yielding high income (FN\*PI), gardening in open spaces or road reserves, and public participation in the development and review of city/town plans (GO\*PP), and gardening in open spaces or road reserves and town planning department having an urban agriculture unit (GO\*TU), land policy and municipal by-laws (LP\*MB), and land policy and physical and land use planning law (LP\*PL). In conclusion, the existing planning institutional frameworks influenced urban agriculture unequally through, their legislative framework, and planning strategies, plans, and programmes, thereby limiting its facilitation and regulation in the three study towns. The study recommends provision of water for urban agriculture as a way of improving food nutrition and income of urban farmers, institutionalization of urban agriculture through formulation and enactment of a specific urban agriculture county legislation or municipal by-laws, for its proper facilitation and regulation, and establishment of urban agriculture unit in planning department to provide oversight for the effective integration and inclusion of UA in urban strategies, plans, programmes.

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

<b>AEZ</b>	:	Agro-Ecological Zones
<b>CAP</b>	:	Chapter of Act of Parliament
<b>EIA</b>	:	Environmental Impact Assessment
<b>FAO</b>	:	Food and Agriculture Organization (UN)
<b>FGD</b>	:	Focus Group Discussion
<b>KII</b>	:	Key Informant Interview
<b>LH</b>	:	Lower Highland (agro-ecological zone)
<b>LM</b>	:	Lower Midland (agro-ecological zone)
<b>MUERC</b>	:	Maseno University Ethics Research Committee
<b>NAP</b>	:	National Agriculture Policy
<b>NGO</b>	:	Non-Governmental Organization
<b>SPSS</b>	:	Statistical Package for Social Scientists
<b>UA</b>	:	Urban Agriculture
<b>UM</b>	:	Upper Midland (Agro-ecological Zone)
<b>IDEP</b>	:	Integrated Development Plan
<b>LPLUDPS</b>	:	Local Physical and Land Use Development Plans
<b>FN</b>	;	Food Nutrition
<b>PI</b>	:	Poultry keeping yielding high income
<b>GW</b>	:	Reuse of greywater in farms
<b>GO</b>	:	Gardening in open spaces or road reserves
<b>TU</b>	:	Town planning department having urban agriculture unit
<b>LP</b>	:	Land policy
<b>PL</b>	:	Physical and land use planning Act
<b>MB</b>	:	Municipal by-laws
<b>PP</b>	:	Public participation in development & review of city/town plans

## OPERATIONAL DEFINITION OF TERMS

<b>Institutional framework</b>	Is a linkage that supports two or more subsystems to enhance easy flow of information or data from one subsystem to another
<b>Planning institutional framework</b>	Refers to governance framework (2 tiers of institutions), organisational framework (planning authorities) and legislative framework (planning laws) and administrative framework (structure).
<b>Planning administrative framework</b>	Is the structure for organizing and supervising planning function including governance, organization and administration
<b>Planning legislative framework</b>	Refers to policies, legislations (both national and county), regulations and by-laws, including taxations and penalties for UA
<b>Urban agriculture</b>	Is the production of crops and animals within urban settlements or areas
<b>Western Kenya</b>	Major towns comprising the Lake Victoria Basin catchment, including Eldoret, Kakamega and Kisumu

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## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background of the Study**

Urban expansion necessitated by the increase in population has led to heightened disconnection between food consumption and production (Sanyé-Mengual, 2015; Paül and McKen-zie, 2013), as well as loss of agriculture land to residential and commercial expansion (Erickson, Lovell and Méndez, 2013). It is estimated that while Africa will be 60% urbanized, while Kenya will achieve 46% urbanization by 2050 (Güneralp et al, 2017; and UN-Habitat, 2018), which means that there will be need for more food in urban areas. All over the world, many urban farmers practice urban agriculture as a source of livelihoods in urban areas. Historically, urban agriculture was vigorously promoted during the First and Second World Wars for food production in the global North, and as a component of food system in the global South (Hallett, Hoagland and Toner, 2016). Some 800 million people are involved in urban farming world-wide (Kamwele, Wagah, Onyango and Nyström, 2014).

Globally, empirical studies show that urban agriculture is important in provision of food and income, creation of resilient food systems, and delivery of environmental, economic, and social benefits (Poulsen et al, 2015; Lal, 2020, & Hallett, Hoagland and Toner, 2016). At the local level in Kenya, urban agriculture also provides food, income, employment and better nutrition (Juma,2015; Simiyu & Foeken, 2013, and Yego, 2011), provides profits especially in poultry farming (Omondi, 2018). It is evident therefore that urban agriculture plays a crucial socio-economic and environmental function (role) in the livelihood of urban farmers. However, a knowledge gap exists in understanding how urban agriculture is managed or facilitated by planning legislative framework so as to fulfil its socio-economic and environmental functions to urban farmers (Yan et al, 2022). Planning institutional framework is an essential component in



realizing the full benefits of urban agriculture. The term institutional framework has been defined as comprising of four key components/elements namely; governance, organisational, legislative and administrative frameworks (Wapwera, Mallo & Jiriko, 2015; Rahman & Abdullah, 2016), or laws, policies and administration (Bandaragoda, 2000). Planning administrative framework refers to the structure for organizing and supervising planning functions in government. This current study therefore views planning institutional framework through the lenses planning legislative framework and contributions of strategies, plans and programmes.

Empirical studies show that there are three principal knowledge gaps in planning legislative framework, which include; creating a better understanding of regulatory possibilities, understanding how local, state, and federal legislations constrain or facilitate urban agriculture, and provision of empirical evidence on the economic, social, and environmental contributions of urban agriculture (Morales & Bonarek, 2017 & Masson-Minock & Stockmann,2010). Studies also show that some of the key interventions in filling policy & legal vacuums such as adoption of enabling ordinances, establishing regulations on urban agriculture production, use of fiscal policy instruments e.g taxes and penalties, amendment of city master plan to set up goals for urban agriculture, promotion urban agriculture as part of the city's economy, revision of purpose and intent of zoning ordinance to regulate agriculture, as well as having special use permit for farm animals, and zoning of urban farming special development district in the zoning ordinance (Mahbubur, Morales & Bonarek,2017, Mogk, Kwiatkowski, & Weindorf, 2010).

At the local level in Kenya, the policy and legislative framework for spatial planning in Kenya mainly consist of: The Constitution of Kenya of 2010, the Sessional Paper No.3 of Land Policy of 2009, the National Agriculture policy (NAP), National Urban Development Policy (NUDP), the Physical and Land Use Planning Act (PLUPA) No. 13 of 2019, County Government Act,

2012 and Urban Areas and Cities Act, 2012, Public Health Act and National Environmental Authority Act (NEMA). This plethora of policies and legislations form the legal basis for making of county level and city level/municipal level plans (Kenya, 2012). However, despite the existence of this robust policy and legal framework especially at national level, the land policy of 2009 asserts that urban agriculture is still not adequately facilitated and regulated in Kenya (Kenya, 2009). It is on this premise that the study seeks to fill the knowledge gap by creating a better understanding of the effects of planning legislative framework on urban agriculture in the rapidly urbanizing towns of Kisumu, Kakamega and Eldoret towns.

Recognizing the critical role played by planning legislative framework in ensuring that urban agriculture is adequately facilitated and regulated, to ensure to achieve its socio-economic and environmental contributions, the study further investigated the contribution of planning strategies, plans and programmes. Globally, many studies show that there are planning strategies for enhancing legal frameworks for urban agriculture namely: Drafting UA policy document, establishing and executing By-law in favour of UA, provision of a UA office by municipality to deliver UA activities, identification and provision of land for farming, inclusion of urban agriculture-friendly policies in general plans, adopting urban agriculture-friendly zoning policies, passing of resolutions, initiatives, and legislation supporting urban agriculture, increasing funding for programs for training farmers, setting up of rules, designing and executing a comprehensive strategy inclusive of urban agriculture, purchase of Development Right (PDR) and expropriation, and zoning of peri-urban land for agricultural purposes (Ramaloo et al, 2018; Mentis & Aslan (2021; Hagey, Rice and Flournoy, (2012); Panagopoulos, Jankovska & Dan (2018); and Ayambire, et al., 2019). However, in the local context in Kenya, previous attempts to draft both a substantive national urban agriculture and livestock production policy,

and national urban agriculture and livestock production strategy ended without much success (Ayaga et al, 2005). In addition to planning strategies, plans and programmes often play pertinent roles in: Provision of strategic guidance to municipalities, linking and coordinating the many different plans and planning processes, operationalizing and alignment to constitutional and legislative statutes, and acting as main tool for strategizing, planning and delivery of developmental projects among others (Harrison, 2001; Odeku,2021, Mashamba,2008). In the local context in Kenya, some of the pertinent plans that are useful facilitating urban agriculture into planning include: County Integrated Development Plan (CIDP), Integrated Strategic Urban Development Plan (ISUDP), Local Physical and Land Use Development Plan(LPLUDP), County Spatial Plan and the Municipal plan.

However, urban agriculture is not considered as a land use category hence not fully included plans and programmes, as some stakeholders view the practice as a Locally Unwanted Land Use (LULU). Public participation is also closely cited as one of key challenges to inclusion of urban farmers in urban plans and programmes. (Aklilu & Makalela, 2020; and Harrison, 2001). A knowledge gap therefore exists in creation of a better understanding on how urban agriculture is facilitated or regulated through planning strategies, plans and programmes in the study areas. It is against this background, that study seeks to fulfil the existing knowledge gap on how urban agriculture is facilitated and regulated by the planning legislative framework, so as to fulfil its socio-economic and environmental functions to the urban farmer, through its planning instruments, particularly planning strategies, plans and programmes.

## **1.2 Statement of the Problem**

Planning institutional framework is an essential component in the realization of the full benefits of urban agriculture by urban farmers, in urban areas. Planning institutional framework that

effectively facilitates and supports urban agriculture, can play a major socio-economic and environmental role in provision of food, income and environmental management benefits in urban areas, particularly, in the rapidly urbanizing towns of Kisumu, Kakamega and Eldoret towns, projected to reach 46% urbanization by 2050.

However, the current planning institutional framework, particularly the planning legislative framework and its derivative planning strategies, plans and programmes, do not effectively facilitate and regulate urban agriculture. In Kenya, a plethora of national planning legislative frameworks which guide urban agriculture have not been domesticated at the county level, to allow for effective facilitation and regulation of urban agriculture in urban areas. These national legislations include: The Constitution of Kenya of 2010, the Sessional Paper No.3 of Land Policy of 2009, the National Agriculture policy (NAP), National Urban Development Policy (NUDP), the Physical and Land Use Planning Act (PLUPA) No. 13 of 2019, County Government Act, 2012 and Urban Areas and Cities Act. 2012, Public Health Act and National Environmental Authority Act (NEMA).

Planning legislative framework forms the basis for the development of planning strategies, plans and programmes that facilitate and support urban agriculture in urban areas. These include: County Integrated Development Plan (CIDP), Integrated Strategic Urban Development Plan (ISUDP), Local Physical and Land Use Development Plan(LPLUDP), County Spatial Plan and the Municipal plan. However, these strategies, plans and programmes do not adequately facilitate and support urban agriculture, since urban agriculture is not considered as a land use category in planning, but rather a Locally Unwanted Land Use (LULU) among some stakeholders

### **1.3 Objectives**

The broad objective of the study was to assess the influence of planning institutional framework on urban agriculture in three towns in Western Kenya.

#### **1.3.1 Specific Objectives**

The Specific Objectives of the study were;

- i. To appraise the socio-economic and environmental status of urban agriculture in the three towns in Western Kenya
- ii. To establish the effect of planning legislative framework on urban agriculture in the three towns in Western Kenya
- iii. To analyse the contribution of planning strategies, plans and programmes to urban agriculture in the three towns in Western Kenya.

### **1.4 Research Questions**

The following are the research questions that were used to address the objectives of the study;

- i. What is the socio-economic and environmental status of urban agriculture in the three towns in Western Kenya?
- ii. What is the effect of planning legislative framework and urban agriculture in the three towns in Western Kenya?
- iii. What is the contribution of planning strategies, programmes and plans to urban agriculture in the three towns in Western Kenya?

### **1.5 Significance of the Study**

This study focused on the influence of planning institutional framework on urban agriculture in three towns in Western Kenya. In this study, the contribution to knowledge was its contribution of valuable knowledge on the socio-economic and environmental status of urban agriculture in

the three towns of Kisumu, Kakamega and Eldoret, in general. It provides useful information that informs formulation of policy frameworks for successful implementation of urban agriculture in towns. It also provides information that can be used by researcher, students and development partners/organizations. The study contributes to policy by helping to achieve global and national government policies, such as Sustainable Development Goals (SDGs) number one on zero hunger, the Constitution of Kenya's emphasis on right to food, the National Agricultural Policy (NAP) 2016 on planning of urban agriculture, and highlighting two critical planning laws to urban agriculture namely; Urban Areas and Cities Act 2012 and Land Use Planning Act (PLUPA) No. 13 of 2019. Lastly, the study contributes to practice through interrogation of the contribution of planning strategies, plans and programmes in enhancing inclusivity of UA and strengthening its proper facilitation and regulation in urban planning.

### **1.6 Scope and Limitations of the Study**

The size and spread of sample was a limitation of the study, since data was collected from only three towns, Kisumu, Kakamega and Eldoret, out of fourteen municipality/county headquarter towns in Western Kenya due to the constraints of time and resources. Collecting data from more than three states would have led to a more rounded generalization. However, the study overcame this obstacle through use of a selection criteria to identify towns suitable for the study.

The scope of the study involved empirically assessing the effect planning institutional framework on urban agriculture in three towns in Western Kenya. It however, it did not cover urban agriculture technologies, informal sector, including non-governmental organization (NGO), involvement in urban agriculture and economic analysis of urban agriculture. This was a multiple case study covering three study towns, which were faced with rapid urbanization and population increase.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presents the theories guiding the study as well as a review of related literature on the study phenomena. The study adopted three theories: Institutional Theory, the Theory of Regulatory Compliance (TRC), and the General Systems Theory. The reviewed literature covered the concepts of planning institutional framework and urban agriculture. The chapter proceeds to present literature on the three aspects of the study which include; the socio-economic and environmental status of urban agriculture, the effect of planning legislative framework on urban agriculture and the contribution of planning strategies, programmes and plans to urban agriculture in three towns in Western Kenya. In addition, the chapter presents gap in literature reviewed in relation to planning institutional framework and urban agriculture. A conceptual framework showing the relationship between planning institutional framework and urban agriculture is subsequently presented and discussed in the last section of the chapter.

#### **2.2 Institution, Framework and Institutional Analysis**

Institutions are a set of norms, values and beliefs formed to ensure that targets are achieved (Wapwera, 2013). A framework, on the other hand, is the linkage that supports two or more subsystems to enhance easy flow of information/data from one subsystem to another (Rahman & Abdullah, 2016; Wapwera, Mallo and Jiriko, 2015). Thus, institutional framework provides the linkage that ensures effective flow of information from one part of a system to another (Wapwera et al, 2015).

There is generally little or no concensus among scholars on the definition of the term institution. Institutions are defined as; "taken-for-granted, normatively sanctioned set of roles and interaction

orders for collective action" (Ocasio et al, 2017). Institutions are also defined as symbols and practices by which roles and interaction orders have been learned over generations and are the products of culture (Ocasio and Gai, 2020). North (1990) defines institutions as rules of the game rather than players who are organizations.

Additionally, Émile Durkheim, the great French scholar, observed that social science is ‘the science of institutions, of their genesis and their functioning’ (Rodríguez-Pose, 2020). Institutions are the rules that govern (North, 1990) and promote (Nelson & Nelson, 2002) human interaction and economic change. This study therefore uses the term institution to mean rules that govern and promote human interactions and economic change, while a framework is the linkage that supports easy flow of information/data from one subsystem to another.

Institutions can be characterized into two categories as either formal or informal institutions (Hodgson, 2006). Formal institutions refer to normally established and constituted by binding laws, regulations and legal orders, which prescribe what may or may not be done, (Hodgson, 2006), and transparent and codified rules, which are universal, transferable, and determine human interaction (North, 2019; Rodríguez-Pose, 2013). On the other hand, informal institutions refer to constituted by conventions, norms, values and accepted ways of doing things, whether economic, political or social, and embedded in traditional social practices and culture which can be equally binding (Hodgson, 2006). Also, Rodríguez-Pose (2020) has defined informal institutions as features of group life, such as norms, traditions, social conventions, interpersonal contacts, relationships, and informal network. However, in this study, the term “institution” means rules, particularly policies, legislations, regulations and by-laws relevant to urban agriculture.



Institutional analysis is often a complex process that needs to be conducted in a systematic way, especially through use of a framework. Hollingsworth (2000) developed a framework comprising of five key components or multiple levels of institutional analysis which include; institutions (first level of analysis), institutional arrangements, institutional sectors, organizations, and outputs and performance, as the fifth level of analysis. Therefore, this study adopted the five multiple levels of institutional analysis (Hollingsworth, 2000) as a basis for analysing planning institutional framework, but with special focus on the first level of analysis, which is about institutions. Bandaragoda (2000) carried out a study on a framework for institutional analysis for water resources management in a river basin context, which used the classical metaphor of institutional analysis. This institutional analysis framework has three key pillars of institutional analysis namely; policies, laws and administration. The current institutional analysis framework used by Bandaragoda (2000) is not only simple but also brings out the three pillars or components that can be used in any institutional analysis. The current study borrows heavily from this study as it focuses on planning legislative framework, largely comprised of policies and laws both at national and county level, and administration which is mostly composed of strategies, plans and programmes.

### **2.3 Planning Institutional Framework**

Institutional framework is a linkage that supports two or more subsystems to enhance easy flow of information or data from one subsystem to another (Rahman & Abdullah, 2016). The significance of planning institutional framework has been discussed in the lenses of solid waste management, public transport management, and water resource management among other urban development discourses (Viet et al, 2009; Songa et al, 2015; Rahman & Abdullah, 2016). According to Wapwera et al (2015), the major components of planning institutional framework

include governance framework (2 tiers of institutions), the organisational framework (planning authorities) and legislative framework (planning laws) and administrative framework (structure). Bandaragoda (2000) defined institutional framework as consisting of three pillars namely laws, policies and administration. These studies were conducted elsewhere in other African countries, particularly in Nigeria and Uganda, but they were not done in the field of urban agriculture but mostly in waste disposal, urban and regional planning and water sector. This current study is therefore an additional contribution to the study of planning institutional frameworks.

Viet et al (2009) indicate that the legal framework for solid waste management in Vietnam has been gradually improved, to include most aspects of solid waste in strategies and laws. However, the laws have not provided a clear-cut competence in solid waste management for certain authorities, leading to situation where solid waste management is under control of many different agencies. As a result of this, solid waste is insufficiently managed by different agencies with overlapping authority, thus making it difficult to take into account the responsibility and accountability among the various authorities regarding solid waste management. In the current study, one can draw a parallel between solid waste management and urban agriculture, since urban agriculture is also incorporated in national legislations, controlled by many different agencies with overlapping authorities such as public health, NEMA, agriculture and planning.

Songa, Rumohr & Musota (2015) assessed the existing policy and institutional framework, and whether it can support water stewardship initiatives or a catchment management plan. The study examined the mandates, structure, roles and capacity of the institutions involved in water resources planning and development, within the context of existing national policy framework and the transition to catchment-based water resources management. The institutional structure broadly provides a suitable framework for implementation of national policies and regulations.

However, there are areas of weakness which give rise to economic, environmental and regulatory water risk. This study, just like the current study, sought to assess the linkage between policy and institutional framework and catchment management plans, much in the same way the current study attempts to look at influence of the planning legislative framework, the strategies, plans and programmes on urban agriculture. Indeed, the institutional structure for planning institutional framework influencing urban agriculture is similarly suitable for implementation of national policies, laws and regulations relating to urban agriculture, but there are obvious weaknesses which relate to lack of domestication of the national legislations at county level to effectively give meaning to proper facilitation and regulation of urban agriculture.

Rahman & Abdullah, (2016) conducted a study to review the magnitude of urban public transportation institutional framework, in order to improve the people's mobility in the major city of Malaysia. An integrated and comprehensive approach is required as it enhances the regulatory framework, planning structure and level of services delivered. This study used a case study design and relied very much on qualitative data encompassing policies and guidelines. The findings of the study show that, putting in place successful public transport projects is a major aspiration that brings significant benefits. In order to achieve a maximum impact, the integration of the public transport policy and urban planning needs to be mainstreamed in policy decisions at local and national level. The higher level of integration is achieved by extending its border beyond the public transport systems by involving other modes of transport and other policies, like land use planning, social and environmental policies. The coherence between policy and public transport will indirectly integrate between public transport and urban planning and also public transport modes. This study mimics the situation between planning institutional framework and urban agriculture, which similarly need an integrated and comprehensive

approach which enhances the regulatory framework, planning structure and level of services delivered. Furthermore, the coherence between policy such as land policy, legislation especially Physical and land use planning Act (PLUPA) will indirectly integrate urban agriculture into urban planning. The current physical and land use planning Act was reviewed in 2019 and therefore any other review to incorporate urban agriculture into it, may only be possible after some time. Policy development cycle usually take upto three years to effect a review of a policy, since it is usually a rigorous process that involves a series of stages namely: Problem emergence, agenda setting, consideration of policy options, decision-making, implementation, and evaluation (Jordan and Adelle, 2012).

Wapwera, Mallo & Jiriko (2015) conducted a study on institutional framework and constraints in the urban and regional planning system in Jos Metropolis, Nigeria, which critically analysed institutional frameworks for urban and regional planning in Jos metropolis, Nigeria by identifying the constraints and their effects on the components of institutional framework. A mixed method Research design which used both qualitative and quantitative techniques with deductive-inductive reasoning. Data collection instruments employed were questionnaires, face-to-face interviews, and case studies documents reviewed with planning authorities. The quantitative data sets obtained were analysed using N-way ANOVA and the qualitative data were analysed using thematic and content analysis. The findings show that the components of institutional framework, specifically, tiers of government (institutions), planning legislative frameworks and the administrations were not significantly affected by the culture, physical, political, institutions, financial, knowledge, analytical and legal constraints whilst the planning authorities were significantly constrained. Further, it revealed that the identified institutional framework is weak which has been constrained by numerous forms of constraints leading to a

non-functional institutional framework. This study forms the basis of the current study as it lays out the key components of planning institutional framework as legislative, governance, administrative and organizational frameworks. Similarly, the current planning institutional framework influencing urban agriculture appears weak and constrained, as there are no specific urban agriculture policy and county legislation, as well as strategies, plans and programmes that are inclusive of urban agriculture, which make framework ineffective in facilitating and regulating urban agriculture.

Mativo(2015) found that Mativo (2015) found that good governance requires that the law be at the centre of planning, and an effective urban planning legal and institutional framework for urban development be put in place to serve as a guideline for implementation of appropriate urban development strategies and plans at the national and county level. Moreover, innovative and more responsive approaches in urban planning to tackle urbanization challenges, given that traditional approaches to urban planning have failed to effectively solve urbanization challenges. Akeem, Olaitan & Abimbola (2018) established that planning regulations are the basic instrument used for land use control through a rigid planning scheme, and that whereas planning regulations emphasize on the minimum provision of better housing, straighter streets, water supply, electricity, telephone facility, schools, parks and hospitals, yet the implementation of these laws for service delivery has not been satisfactory to the people of Lagos state ,especially among the urban poor. Similarly, planning legislative framework framework is considered important for setting the limits for public and private land use within a given area (Mativo, 2015; Abiodun, et al, 2018). These studies argue that legal and institutional framework are necessary for development of strategies and plans, which must adopt more innovative and responsive approaches to urban development. Moreover, planning regulations are basic instrument for land

use control, setting minimum provisions for service delivery, although the implementation has not been satisfactory. Appropriate legal and institutional framework, planning regulations and the issue of implementation are not only a requirement in urban development but also relevant to the issue of urban agriculture. Whereas urban agriculture operates within planning institutional.

In Kenya, institutional planning framework is pegged upon several policies and national legislation which include the Constitution of Kenya of 2010, the Sessional Paper No.3 of Land Policy of 2009, the National Agriculture policy (NAP), National Urban Development Policy (NUDP), the Physical and Land Use Planning Act (PLUPA) No. 13 of 2019, County Government Act, 2012 and Urban Areas and Cities Act. 2012, Public Health Act and National Environmental Authority Act (NEMA), (Nabutola, 2012; UN Habitat, 2017; Kenya, 2019). The Physical and Land Use Planning Act mandates planning administrative frameworks to declare special planning areas, for a particular development activity and to enforce land use controls. Similarly, Article 184 (1) (b) of the 2010 Constitution provides for the enactment of a national Urban Areas and Cities Act (Parashina, 2018). Section 12 (1) of the UACA vests the management of cities and municipalities in the respective county governments, which in turn delegates such management roles to boards of cities and municipalities as well as city or municipal managers. Furthermore, Article 185 (2) of the Constitution permits a county assembly to enact necessary laws for the effective performance of the functions and exercise of the powers of the county government including urban management, as specified under the Fourth Schedule of the Constitution (Kenya, 2010). On its part, the National Urban Development Policy (NUDP) provides a framework for strengthening governance, planning, urban investments and delivery of social and physical infrastructure among cities under devolved governments (Nabutola, 2012). In a nutshell, in Kenya, literature on institutional frameworks have been documented in areas such

as control of residential buildings (Omollo, 2020), solid waste management (Kathambi & Ogutu, 2020), spatial location factors affecting the integration of urban agriculture into land use planning (Kamwele, Onyango & Wagah, 2016) & legal and policy framework affecting the development of urban agriculture market (Kamwele, et al 2014).

## **2.4 Planning Institutional Frameworks and Urban Agriculture**

The first objective of this study was to appraise the socio-economic and environmental status of urban agriculture in the three towns in Western Kenya. This study adopted the planning institutional framework emanating from the characterization of institutional framework for managing urban sprawl in the wake of widespread urbanization, which comprises of four key components/elements namely; governance, organisational, legislative, and administrative frameworks (Wapwera et al 2015, Wapwera, 2013; Rahman & Abdullah, 2016). It also draws from the works of Bandaragoda (2000), which viewed planning institutional framework as consisting of three pillars namely laws, policies and administration.

This current study therefore views planning institutional framework through the lenses planning legislative framework mostly consisting of policies, laws and administration. This study investigated how planning institutional framework related with urban agriculture, based on documented literature, among others issues.

### **2.4.1 Status of Urban Agriculture**

All over the world, many urban farmers practice urban agriculture as a source of livelihoods in urban areas. Historically, urban agriculture was vigorously promoted during the First and Second World Wars for food production in the global North, and as a component of food system in the global South (Hallett, Hoagland and Toner, 2016). Some 800 million people are involved in

urban farming world-wide (Kamwele, Wagah, Onyango and Nyström, 2014). Urbanization and population increase are two factors that perpetuate disconnect between food consumption and production (Sanyé-Mengual, 2015; Paül and McKen-zie, 2013), as well as loss of agriculture Land to residential and commercial expansion (Erickson, Lovell and Méndez ,2013). Peerzado, Magsi & Sheikh, (2018) found out that according Hyderabad Development Authority (HDA), in last 20 years convert around 13,000 acres of pure agricultural land was lost to other urban development activities. Urbanization, overpopulation, water shortage, housing demands and land valuation is main reason behind agricultural land conversion in study area. So, there is need of land management system and land use policy required to save the conversion of agricultural land from concerned factors. It is estimated that while Africa will be 60% urbanized, while Kenya will achieve 46 % urbanization by 2050(Güneralp et al, 2017; and UN-habitat, 2018), which implies the more agricultural land will continue to be converted to urban lands, hence the need to find ways of producing food within urban areas.

The unprecedented growth in urban population and widespread urbanizations call for innovative planning solutions such as delocalisation of the food system and a narrowing of the cities' food sheds (Skar et al, 2019). Propelled by the Food Policy Pact signed by more than 180 cities since its foundation in 2015 during the Milan World Expo, municipalities around the world are beginning to consider food issues in their city planning proactively (Borron & Holt, 2016). Urban agriculture has thus become a significant consideration in planning frameworks particularly across the developed cities such as Melbourne, New York, London, Guangzhou and Johannesburg among others (Lovell, 2010; Buxton & Carey, 2014; Yang et al, 2020). About 842 million people were estimated to be suffering from chronic hunger by the year 2013 (FAO, 2013).



Globally, empirical studies show that urban agriculture is important in provision of food and income, creation of resilient food systems, and delivery of environmental, economic, and social benefits (Poulsen et al, 2015; Lal, 2020, & Hallett, Hoagland and Toner, 2016). At the local level in Kenya, urban agriculture also provides food, income, employment and better nutrition (Juma,2015; Simiyu & Foeken, 2013, and Yego, 2011), provides profits especially in poultry farming (Omondi, 2018). It is evident therefore that urban agriculture plays a crucial socio-economic and environmental function (role) in the livelihood of urban farmers. However, a knowledge gap exists in understanding how urban agriculture is managed or facilitated to fulfil its socio-economic and environmental functions to urban farmers (Yan et al, 2022).

Urban Agriculture (UA) can be defined as “farming operations taking place in and around the city that beyond food production provides environmental services (soil, water and climate protection; resource efficiency; biodiversity), social services (social inclusion, education, health, leisure, cultural heritage) and supports local economies by a significant direct urban market orientation” (Sanyé-Mengual 2015). Smit (1996) and Mougeot (2001) (cited in Skar et al, 2019) defined urban agriculture as integration of farming practices into the urban economic and ecological system, based on the seminal publication of the United Nations Development Program (UNDP). However, integration of such practices requires positive and proactive planning frameworks (Cinà & Khatami, 2017). Discussions of the success of such integrations have been inconsistent especially in the developed world, with limited documentation being recorded in the developing countries.

Literature review tends to show that certain studies have identified institutional framework as necessary for the practice of urban agriculture, while others have not. In Germany, Artmann and Sartison (2018) analysed the role of urban agriculture as a nature-based solution by conducting a

systemic literature review, incorporating 166 academic articles focusing on the global north. The results of the review showed that urban agriculture contributes to ten key societal challenges of urbanization: climate change, food security, biodiversity and ecosystem services, agricultural intensification, resource efficiency, urban renewal and regeneration, land management, public health, social cohesion, and economic growth. The study demonstrated how urban agriculture contributes to ten key societal challenges of urbanization, including food security, but failed to show how urban agriculture has been infused into institutional framework in their study. This concurs with Lovell (2010) who did not identify regulatory frameworks within the myriad units of local governments as a barrier of urban agriculture practice. The author reviewed literature on barriers to urban agriculture and identified limited access to land, insufficient infrastructure and supportive services, intense competition from other land uses, lack of research on human health risks in growing food, and lack of skills and experience in urban agriculture.

Grilo et al (2016) assessed the motivation, benefits and challenges faced by gardeners who use allotment gardens using semi-structured interviews with gardeners in 60 informal allotment gardens in Lisbon. Questions focused on the gardeners' profile, their motivations for cultivating, and the challenges faced during cultivation. The interviewees consisted mostly of elderly, retired men, previously acquainted with agricultural activities. The great majority cultivated crops for leisure and highlighted the importance of being outdoors, not referring to the potential economic benefits from such endeavors. Still, more than 60% of the interviewees believed that they do save money with this activity. The most recognized challenge, due to the climatic features of the city, was related with water shortage, preventing gardening activities during hot months. The importance of gardening activities for elderly gardeners was also highlighted, as an activity that can help to provide physical, psychological, and social well-being. Notwithstanding, the

influence of institutional framework on urban agriculture was not covered in Grilo et al (2016). On the other hand, a number of authors have identified institutional frameworks as a key element influencing urban agriculture. Cinà and Khatami (2017) conducted a study which sought to point out the factors that hinder or favour urban agriculture in Iran. By referring to city maps and recent urban schemes, the authors summarized the physical characteristics, the ownership, and the resources of each class, from inside the compact city to its peripheral belt. The article concluded that three main factors that can favour effective policies and practices for multifunctional urban agriculture are policy, education, and social commitment. Although the study did not specifically mention institutional framework as a factor it, however, specified policy as one of main factors that can favour urban agriculture.

Kuusaana and Eledi (2015), using qualitative data and narratives studied urban farmers' production systems in the Tamale Metropolis in Ghana. The study observed that as urbanization increases, farmers are being pushed unto less favourable locations, farther villages or restricted to unauthorized public spaces in order to continue production. The absence of urban green belts reduces farming to flood plains and along public drains where wastewater is used for irrigation. The authors decried the absence of institutional framework for enhancement of urban agricultural practice. This concurs with Martinez and colleagues (2010) who examined barriers to local food market expansion (as opposed to urban agriculture) and identified limitations in capacity, lack of infrastructure, lack of trace-back mechanisms to identify the source of food aggregated to supply large consumers, limited experience and training of farmers, and regulatory uncertainties.

Makaya and Todzwo (2019) investigated the impacts of urban farming on environmental integrity and explored institutional coordination in the management of urban environment in Kadoma town in Zimbabwe. To collect data, key informant interviews, semi-structure

questionnaires and observations were used. They showed that urban farming is being practiced with no due regard to the environment by both farmers and players in environmental management. The aquatic environment was most affected through river and dam siltation and eutrophication; which ultimately affected water quality. The Kadoma municipality was not enforcing its by-laws while the Zimbabwe Environmental Management Agency was also not monitoring and managing the environmental impacts due to urban agriculture. There was no coordination among environmental managers to mitigate environmental degradation in the town. Therefore, it was recommended that the municipality should regulate urban farming and all players in environmental management to coordinate their efforts for effective environmental risk reduction. This study highlights the essence of institutional coordination, which is a factor of an effective institutional framework for management of urban environment, including urban agriculture.

One of the ways that urban agriculture can be supported by municipal or planning administrative frameworks is through provision of extension services, probably through a different department, to urban farmers. Salau and Attah (2012) assessed the contribution of UA to the socio-economic development of urban farmers in Nasarawa state, Nigeria, which found out that certain constraints facing the enterprise included poor extension service, lack of access to credit facilities and high cost of labour. Similarly, Tugwell (2012) investigated the adoption of UA and socio-economic factors that promote urban agriculture in Zimbabwe, where accessibility of extension services was noted as a factor in prevalence of urban agriculture. Findings showed that availability of land, official support for the practice, affordability of urban agriculture, vitality of urban agriculture in providing food and income as well as accessibility of extension services explained the prominence of urban agriculture.

Another study done in Ethiopia by Abera, Tadesse and Belayneh (2017) assessed the practices, roles and challenges of urban agriculture in Bedelle town using 60 respondents obtained through purposive and stratified random sampling methods. The result of the study reveals that the major challenges of urban farming practices in the area includes; lack of access to credit, shortage of inputs, land granting system, lack of technical support from concerned bodies/less contact with agricultural sectors, lack of enough space/land shortage for cultivation, disease, problem of market. Although all these studies did not specifically mention institutional framework as a factor in urban agriculture practice, they singled out issue of extension service or technical support as an important element in urban agriculture practice (Salau & Attah, 2012; Tugwell, 2012; Abera et al, 2017).

Researchers have argued that people adopt urban agriculture due to its benefits such as provision of food, income and employment among others. Gelan and Seifu (2016) assessed the determinants of employment generation through urban agriculture in the Bishoftu area of Oromia region, Ethiopia using both secondary and primary data. To analyze the data, both descriptive and inferential techniques were applied. The result indicated that various types of urban farming such as; poultry, fattening, dairy, fruit and vegetable, nursery and ornamental crops, flowers has extensively been found in the city. The result further showed that the sector has played multiple roles to the farmers such as; a means of income generation, employment and household food supplement. Though the result stated that both household level and SME-organized farms contribute to employment generation, those organized by SME have created more jobs than that of household level farms. Schmidt, Magigi and Godfrey (2014) analysed the degree to which urban farming associations is organized is related to the rate of urbanization, specifically demographic changes, the institutional landscape in which they operate, the environmental

context, as well as underlying economic structure or local economic base. The authors utilized semi-structured interviews of farmer associations and interviews with government officials in Moshi and Dar Es Salaam, Tanzania. They found out that the manner in which groups organize, the economic role they play, the issues they are concerned with, and the degree to which they collaborate are quite varied. These differences were exacerbated by urbanization patterns that impact the role and functioning of urban agricultural organizations, by placing pressure on resources such as available land and water and increasing demand for the products of urban farmers.

In Eldoret, Kenya, Kamwele, Wagah, Onyango and Nyström (2014) examined the legal and policy framework affecting development of urban agriculture. Using Eldoret Municipality case study, purposive sampling was employed and targeted Land Use Policy of 2009. Key informant interviews were conducted with top government officials of the Ministries of Lands, Public Health, Local Government, Environment, and Agriculture, Eldoret Municipal Authority and Physical Planning Department. Findings revealed that there was no specific planning policy on urban agriculture. Eldoret Municipality recognizes the importance of urban farming as an important livelihood component, by tolerating the practice although, translation of this awareness into a formal recognition in by-laws and ordinances has not been done. Korir, Rotich & Mining (2015) investigated the contribution of urban agriculture to the food security of residents of Eldoret Municipality, Kenya, with the aim of laying the foundation for future policy formulation. The study used a cross sectional survey design that entailing collection of both qualitative and quantitative data. The study sample was made up of urban farmers from low-income residential areas that practiced urban agriculture in Eldoret Municipality. The finding of Kamwele et al (2014), concurs with findings of this study since to date urban agriculture is not necessarily legal

but allowed. Urban agriculture is already incorporated into the national legislations such as Land policy and urban Areas and Cities Act 2012 but so far no specific county legislation has been enacted that officially legitimizes the practice at county level. Their findings suggested that urban agriculture plays other important roles including provision of better nutrition, poverty alleviation, employment creation and environmental conservation.

The foregoing studies tend to show that urban agriculture has motivations and benefits which attract urban farmers, and include food, income and employment among others, (Schmidt et al, 2014; Korir et al, 2015; Gelan & Seifu, 2016). Urban agriculture is a creative and sustainable way to reclaim unused land and offers a practical economic growth strategy for cities. Since these properties will be put back to productive and sustainable use, there is no need to spend money keeping them secure, clean, and maintained. It increases the accessibility, safety, and quality of food as well as the aesthetics of the city (Mogk, Kwiatkowski, and Weindorf, 2010).

Urban agriculture practices often manifest in different types of production and scales. Ogendi, Mukundi & Orege (2014) sought to establish the type and distribution of urban and peri-urban agriculture production systems in Nairobi County, Kenya. Results revealed that crops only were grown in Kamukunji district (58.8%) while mixed farming was practiced mainly in Starehe district (39.1%). Multi-storey (42.5%) and moist gardens (25%) were the most common production technologies in urban areas while in the peri-urban, drip irrigation (23.6%) and multi-storey gardens (25.5%) were the preferred technologies. Karimi (2010) conducted a study in Nairobi which asserts that the rate of practice among potential users of multi-storey gardens remains low and, that although 80% of the respondents were aware of multi-storey garden farming system, the practice rate was 60%. Muriithi (2011) found out that based on gender of the head of household, majority who adopted urban agriculture were women. Kibiti and Gitonga

(2017) found out in Meru town, that 50.67% of the urban farmers who had adopted hydroponics were female while 49.33% of the urban farmers were male. This implies that both men and women are equally involved in urban farming. Urban agriculture practices have been widely documented as presented in the preceding paragraphs. However, as stated in some studies conducted among some cities (Cinà & Khatami, 2017; Artmann & Sartison, 2018) the practice suffers from lack of legal recognition and support from administrative institutions. In other studies, especially in Africa, the practice of urban agriculture seems to be undertaken as a part time engagement more so by females to boost household food supply (Muriithi, 2011; Schmidt et al, 2014; Korir et al, 2015). Significantly, the reviewed literature illustrates that planning institutional frameworks have not focused on how urban agriculture should be managed as one of the development investments in cities in the developing countries.

McClintock and Simpson (2018) found out that there are six motivational frames that appear to guide organizations and businesses in their UA practice namely; entrepreneurial, sustainable development, educational, eco-centric, do-it-yourself (DIY) secessionist, and radical motivations. Practitioners adopt different frames based on their interests for practising UA namely; entrepreneurial frame which value capitalist economic development and environmental concerns, but downplay social concern, while sustainable development frame focuses on food security, food quality, public health/ nutrition, sustainability, self-sufficiency, and community. On the other hand, educational frame emphasizes social, economic and environmental concerns but with slightly less emphasis on profitability, while eco-centric frame is concerned with sustainability, but with greater emphasis on environmental health and wellbeing over and above the social or economic concerns. However, Do-It-Yourself (DIY) secessionist frame is based on strategic preference for withdrawing and/or creating alternatives to the dominant system rather



than challenging it directly”, while radical frame emphasizes UA’s contribution to social justice, food justice, food sovereignty, and anti-capitalist exchange, privileging social concerns over environmental concerns and profit. It appears there are three main axes of concern determining the six motivational frames in UA namely; social, economic/profitability and environmental concerns., and it is upon this premise that the current study is also based. Indeed, these six paradigms provide a basic framework for understanding UA in terms of intentions of practitioners and outcomes accrued.

Anwarudin and Maryani (2017) assessed the effect of the strengthening of farmer groups and Farmers Group Association simultaneously and directly on farmers' participation and influence of farmer groups, Farmers Group Association and participation of farmers simultaneously and directly on the farmer self-reliance in Bogor, Indonesia. The results showed a significant direct effect of the strengthening of farmer groups to the participation of farmers. Strengthening farmer groups and farmers' participation simultaneously significantly affected the independence of farmers.

Smit (2016) found there were many knowledge gaps in urban food systems which included, relatively adequate literature on urban food systems in primate cities, but very few studies in secondary cities, which account for most of the urban population growth in Africa. The study concludes that local governments potentially have an important role to play in promoting urban food security, although this is constrained by fewer resources at the disposal of local government in Africa. In this present study, urban agriculture is viewed as contributing to urban food system through provision of food to urban dwellers in towns, and therefore, the role of local government or county government as may be the case in Kenya, would be important in enhancing this contribution of UA to urban food supply. Based on the foregoing literature review, urban

agriculture is not necessarily legal but allowed, since it is already incorporated into the national legislations, although so far, no specific county legislation has been enacted that officially legitimizes the practice at county level. Since the county legislations are usually derived or domesticated from national policies and laws, it means urban agriculture is allowed but operates under other government laws like public health, NEMA, Physical and land use planning regulations framework among others.

#### **2.4.2 The Effect of Planning Legislative Framework on Urban Agriculture**

The second objective of this study was to establish the effect of planning legislative framework on urban agriculture in the three towns in Western Kenya. This was investigated using three variables which included policies, planning laws and Regulations, and law enforcement and Compliance including penalties and taxations.

Planning institutional framework is an essential component in realizing the full benefits of urban agriculture. The term institutional framework has been defined as comprising of four key components/elements namely; governance, organisational, legislative and administrative frameworks (Wapwera, Mallo & Jiriko, 2015; Rahman & Abdullah, 2016), or laws, policies and administration (Bandaragoda,2000). This current study therefore views planning institutional framework through the lenses planning legislative framework mostly consisting of policies, laws and administration.

##### **2.4.2.1 Planning Policies**

Institutional framework, such as land use policies, have been developed and implemented in both high income as well as low-income countries to cope with the effect of urbanization (Aribigbola 2013; Jain, Korzhenevych & Pallagst, 2018). Recognizing the surging urban population in cities

in developing countries, forecasted to be close to 70% by 2030, it is imperative to ensure prudent urban planning by city management (UN Habitat, 2018). According to Kitur (2019), an urban planning framework should be a tool that aids the urban area to better use its resources, including land by guiding investments in the area, and collaboration between the stakeholders.

According to Bonye, Yiridomoh and Der Bebelleh (2020), land use policies are used as effective means in urban planning to regulate urban population growth. For instance, Sindh Act in Pakistan is meant to regulate urban land use to cater for development practices of all players (Peerzado, Magsi & Sheikh, 2018). On the other hand, Al Jarah et al. (2019) postulate that town policy and the growth pole policy are used to manage and control urban sprawl and regulate urban land use in Iraq. In Nigeria, Oluwasey (2019) explains that development control is a tool used for guiding developers to conform to planning standards and regulation to make the environment aesthetically pleasing. From the aforementioned studies, there is considerable evidence pointing to the use of planning policy frameworks as tools in promoting urban development in various parts of the world. However, the significance of urban planning frameworks as tools in controlling urban agriculture seem to suffer a dearth of documentation, Currently, there is no specific national urban agriculture policy in Kenya (Kamwele et al,2014), as previous attempts at formulation of policy failed to see the light of the day (Ayaga et al, 2005).

#### **2.4.2.2 Planning Legislative Framework and Regulations**

Planning Legislative framework are enacted laws, regulations and pro-active interventions such as laws, by-laws, rules, taxations and penalties that ensure procedures are adhered to during the practice of urban agriculture. Effective urban land planning legislative frameworks to tackle the attendant land use problems such as formation of slums, incompatible use, unapproved or sub-

standard developments for the purpose of achieving a sustainable city development is absolutely necessary (Mativo, 2015). Planning legislative framework is a collection of interrelated statutory and administrative instruments and techniques designed to safeguard, regulate, conserve and disburse land that is in the interest of the overall community, as well as control the character, appearance and arrangements of building facilities to ensure economy, convenience and aesthetic appeal. Indeed, they are procedures used for controlling land use development in line with an approved plan of a residential, commercial or industrial estate within an environment, (Abiodun, et al, 2018).

Historically, most planning legislative frameworks used in developing countries, including many African countries, were inherited from colonial powers and have continued to be used to date. Chigudu (2021) established that both Zimbabwe and Zambia adopted the British institutional and statutory frameworks, which have continued to guide development of their urban areas in both pre-independence and post-independence era. However, in addressing urban development inequalities, both nations have sought to use the colonial institutional and statutory framework that seems difficult to shake off. Both countries have attempted to address their current urban development challenges using their colonial statutory framework, which do not seem to work despite making a few structural changes in the statutes after independence. The findings of this study points to the dire need to completely review the old colonial institutional and statutory frameworks, so as to adequately address current urban development problems. It is in this respect, Kenya promulgated a new constitution in the year 2010, that now gives discretion to planners to review of some of the colonial institutional and statutory frameworks in planning.

Empirical studies show that there are three principal knowledge gaps in planning legislative framework, which include; creating a better understanding of regulatory possibilities,

understanding how local, state, and federal legislations constrain or facilitate urban agriculture, and provision of empirical evidence on the economic, social, and environmental contributions of urban agriculture (Morales & Bonarek, 2017 & Masson-Minock & Stockmann,2010).

Urban agriculture can be tackled by adopting enabling ordinances, establishing regulations on urban agriculture production and use of fiscal policy instruments e.g taxes and penalties,(Mahbubur, Morales & Bonarek,2017, Mogk, Kwiatkowski, & Weindorf, 2010). Masson-Minock & Stockmann (2010) argue that before engaging in formulation of a legal framework for urban agriculture, there is need to assess whether policy changes are necessary or allowed under existing policy. Policy change takes time, with some cities passing policy relatively quickly, while others take many months or years. Planning regulations are important because they set the limits for public and private land use within a given area. The need to create a better understanding of urban agriculture among planners is key to formulating suitable regulatory frameworks. Mahbubur, Alfonso and Leonard (2017) assert that planners should assess existing urban agricultural practices and consider which regulatory frameworks best support multiple local goals, incorporating a concern with urban agriculture into ongoing activities, deploying existing or innovative land use tools, facilitating institutional cooperation, and promoting inclusive decision making and community engagement. It is noteworthy to observe that how such legislative frameworks influence the level of practice of urban agriculture varies from one town to another, as has been demonstrated by many studies. Meenar, Morales and Bonarek (2017) examined the regulatory practices of 40 Metropolitans and 40 micro-politan municipalities in the USA. They found that municipalities are filling policy vacuums by adopting enabling ordinances (zoning ordinances, land use designations, resolutions), regulations on urban agriculture production (backyard animals, built structures, practitioner responsibility), and fiscal

policy instruments (restrictions on sales of agricultural products, tax abatement, urban agriculture fees). Castillo et al (2013) found that there were seven perceived barriers to urban and peri-urban agriculture in the greater Chicago area. Among the barriers was the unclear or agriculture-unfriendly regulations and farmers being forced to operate within a legal limbo or petition for exceptions to a variety of current regulations.

Akeem, Olaitan & Abimbola (2018) assert that Planning regulations emphasize on the minimum provision of better housing, straighter streets, water supply, electricity, telephone facility, schools, parks and hospitals. Yet the implementation of these laws for service delivery has not been satisfactory to the people of Lagos state, especially among the urban poor. Poor planning regulations and lack of political determination have resulted in the poor implementation of planning standards and laws regulating urban improvement. Planning regulations were partially or not enforced to standard, according to a study by Korzhenevych & Pallagst, 2018)2.4.2.3 Law Enforcement and Compliance

The researcher also reviewed literature with regard to taxation and penalties instituted on urban agriculture. Onaiwu (2020) focused on the assessment of public compliance with development control in Auchi in Nigeria. A sample of 378 residents of Auchi, were used in the study. The study area was divided into six strata and samples selected from the strata based on their population sizes. The instrument was a 5-point Likert-type option, which was administered on the respondents. Findings show there was awareness of developers on compliance which did not translate into compliance. The building coverage specified by development control regulations was grossly violated. There was a medium correlation between education and level of noncompliance; the variability of development control noncompliance in the six quarters of Auchi was statistically significant, and the eta squared effect was also large. A study by

Atamewan (2019) evaluated factors affecting the implementation and compliance with housing standards for sustainable housing delivery in Bayelsa State, Nigeria. The methodology employed was a qualitative research approach involving in-depth interviews, physical observations and detailed, systematic and thorough review of literatures, Purposive, random and expert sampling techniques were used. Findings show that there was compliance with housing standards factors such as administrative practices, uncertainty of standards, socioeconomic, demographic and socio-cultural factors.

In Ghana, majority of respondents did not have building permits or site plans before putting up their buildings. Compliance with land use planning guidelines takes away the fear of legal action by the State against land developers. Also economic, institutional, legal and social factors determined the level of compliance with land use planning guidelines. It also enhances efficiency in tax administration and prevention of conflicts among landlords and tenants (Bonye, Yiridomoh & Der Bebelleh, 2020).

Kabando and Wuchuan (2014) assessed the various flaws in the building code and code making process in Kenya. The study found out that housing and infrastructure policies and adaptive by-laws have led to calamities and epidemics being reported all over. Poor planning, administrative procedures and inadequate enforcement strategies are some of the challenges facing the building code in Kenya. Another study by Omollo (2020) examined the extent to which developments in Kenya have been complying with the planning standard on building lines, having Kisii town as a case study. A sample size of 364 residential developments were randomly and proportionately drawn from the seven neighbourhoods. Remote sensing and questionnaires were used to collect data and thereafter analysed using GIS, descriptive and inferential statistics. Research findings disclosed that most residential developments did not comply with the recommended building

lines. The results of hypothesis similarly confirmed low compliance that was statistically significant. Non-compliance was found to be caused by the failure of the County Government of Kisii to ensure that developers obtained the obligatory development permissions.

On taxes and penalties, Miles, Boumbakare and Gerold (2019) point out that, the most popular revenue generating activities in low-income countries use indirect methods: typically, fixed fees such as license fees, land fees, and trading fees. These fees can be imposed easily, often at a single location. For example, Rwanda applies a trading license fee to farmers who wish to sell their products commercially. OECD (2019) concurs that tax credits or reduced tax rates (either on income or, in some cases, on labour costs) theoretically incentivise innovation by reducing the relative cost of that activity, but the extent to which this occurs is highly dependent upon the policy's design. Miles, Boumbakare and Gerold (2019) further argue that attitudes are shifting in some countries, where the conventional wisdom that farm subsidies and tax exemptions are helpful is being eschewed, since there has been little evidence of clear cause and effect between tax exemptions and farm activity. It appears that governments in developing countries, including Kenya are slowly beginning to bring farmers into the tax net irrespective of their economic status.

The discussion on the foregoing paragraph show that planning legislations set the diverse control limits for public and private land use within a given area. The literature has highlighted the fact that among cities in the developed nations, planning legislative frameworks have enabled ordinances of use of open spaces for urban agriculture practices (Castillo et al, 2013; Meenaret al, 2017). However, In Africa, literature on planning legislative frameworks has concentrated on compliance with building codes and infrastructural regulations (Atamewan, 2019; Bonye et al,



2020; Omollo, 2020). However, how planning legislative frameworks influence urban agriculture practice in Africa including Kenya seems to suffer a dearth of literature.

### **2.4.3 The Contribution of Planning Strategies, Plans and Programmes to Urban Agriculture**

The third objective of the study was to analyse the contribution of planning strategies, programmes and plans to urban agriculture in the three towns in Western Kenya. The variables that were investigated included planning strategies, plans and programmes that relate to urban agriculture.

Planning strategies, plans and programmes are essential instruments for implementation of policy, strategies and legislations, and they often play critical roles in: Provision of strategic guidance to municipalities, linking and coordinating the many different plans and planning processes, operationalizing and alignment to constitutional and legislative statutes, and acting as main tool for strategizing, planning and delivery of developmental projects among others (Harrison, 2001; Odeku,2021, Mashamba,2008).

#### **2.4.3.1 Planning Strategies for Urban Agriculture**

A strategy is defined as purposeful action or design for action in essence or conception preceding action. In the military, strategy is concerned with drafting the plan of war thereby shaping the individual campaigns and decision-making for individual engagements (Mintzberg, 1987). In the current study, strategy is viewed both as a plan and purposeful action in planning. It is important to note that urban planning is a process of developing and designing urban areas to meet the needs of a community, and operates under seven types of planning concepts which include: strategic, land use, master, urban revitalization, economic development, environmental and infrastructure planning. Of these seven types of urban planning, urban agriculture relates more

with strategic and land use planning. Ramaloo *et al.*,(2018) specifically identified legal framework strategies that could propel urban agriculture development which include: Drafting UA policy document, establishing and executing By-law in favour of UA, and provision of a UA office by municipality to deliver UA activities. The study also identified other key prioritized strategies such as financial, infrastructure, land, water, environment and health, social, marketing, and research and development aspects. Similarly, Mentis & Aslan (2021) posit that creation a legal framework for urban agriculture is an important strategy to protect and enforce the right to food, and that urban agriculture is not included in both national and local legislation in Turkey.

Furthermore, Hagey, Rice and Flournoy, (2012) suggests several policy strategies for building an urban agriculture movement which include; Identification and provision of land for farming, inclusion of urban agriculture-friendly policies in general plans and adopt urban agriculture-friendly zoning policies, passing of resolutions, initiatives, and legislation supporting urban agriculture, increasing funding for programs that train urban farmers and offer technical assistance, among others. Cohen (2020) asserts that creating an urban agriculture plan can be the process by which the public defines the spatial, administrative, and financial commitments required for a larger, more equitable, and more resilient urban agriculture system.

On the other hand, Mansfield & Mendes (2013) also assert that municipalities lack a comprehensive municipal food strategy, that helps to integrate urban agriculture production, food processing, food distribution, food access and food waste management into a single policy framework. Similarly, Panagopoulos, Jankovska & Dan (2018) concluded that the key municipalities strategies for urban agriculture intervention include establishing communal infrastructures, setting up of rules, and designing and executing a comprehensive strategy

inclusive of urban agriculture that ensures city's resilience. Moreover, Ayambire, et al. (2019) assert that Purchase of Development Right (PDR) and expropriation, and zoning of peri-urban land for agricultural purposes, use of container gardening, backyard gardening, and farming on vacant lands and marginal lands are important strategies for promoting access to land for peri-urban agriculture, although this requires revision of city legislation and the land use planning process to legitimise and promote agriculture in cities.

In terms of environmental strategy, Saprykina, (2022) argue that organic farming (urban agriculture) is a useful environmental strategy for rehabilitation of urban space. Other ideas include the use of solar powered aerostatic objects e.g flying gardens, to deliver oxygen and purify air in urban environment, recycling waste for conservation of energy and use of renewable resources, intensive food production, rational use of urban land (vertical farms), creation of green spaces, creating photosynthetic cities including "green infrastructure" in cities to ensure city sustainability, among others.

Likewise, O'Sullivan, et al (2019) found out that strategies for improving crop yields and quality in urban agriculture include pairing advancements in environmental controls, **phenomics** (changes seen in an organism resulting in variations in the phenotype during the life span of the organism) and automation with plant breeding efforts so as to adapt traits for architecture, development and quality (taste and nutrition). In the local context in Kenya, attempts have been made to draft both a national urban agriculture and livestock production policy and a national urban agriculture and livestock production strategy but without much success (Ayaga *et al*, 2005). In addition, there is the Agriculture Sector Growth and Transformation Strategy (ASTGS-2019-2029) which will guide agriculture sector for the next ten years (Kenya, 2019).

The foregoing discussion highlights a number of studies that single out various strategies for development, promotion, planning and regulation of urban agriculture in cities. However, apart from study by Ayambire, et al. (2019) and Ayaga et al (2005) most studies have been conducted at global level, with only a few studies documented locally. It is also evident that attempts to develop a substantive strategy for urban agriculture has so far not been successful in Kenya, which imply that urban agriculture is practiced without a proper specific policy and strategy thus hindering farmers from maximizing its benefits. Therefore, there is a literature gap with regard to planning strategies within the local context.

#### **2.4.3.2 Urban Plans, Programmes and Urban Agriculture**

The distinction between local plans and programmes is that, local plans are statutory and multi-topic policy statements for subareas while programmes are non-statutory, single-topic statements for whole areas. This means that plans are essentially backed by legislation, but there is no statutory source from which functions of programmes are derived. Main function of a programme is to apply the strategy of the structure plan, state detailed programme area policies, detail resource implications of programme area policy, provide the link with resource management, medium term financial and manpower planning and annual budgets. However, the function of plan is to apply the strategy of the structure plan , state detailed local policies, and bringing local issues and policies before the public (Solesbury, 2013). Thus, the three terms strategy, plans and programmes are interlinked, with strategy being at the higher level, followed by plans and programmes at the lower level in the hierarchy.

One of the higher level plans that operationalizes the strategy is a strategic plan. It focuses on setting high-level goals and determines desired areas of growth for a city or metropolitan area, and often used as a subjective tool for identifying how to enhance quality of life in urban areas

(Khalil,2012). The practical outcome of strategic planning is usually a strategic plan (Uzarski & Broome (2019). A study conducted in Eldoret municipality concluded that Municipal council of Eldoret faced challenges in the implementation of her strategic plan. Institutional related factors, such as inadequate technological resources, and lack of management systems, were cited as the main contributors to the study's findings (Buluma, Keror, & Bonuke, 2013). These challenges of implementation of a strategic plan usually impact on the practice of urban agriculture Land use planning is another aspect of planning that relates to urban agriculture in towns. It is concerned with legislation and policy, as well as adoption of planning instruments like governmental statutes, regulations, rules, codes, and policies that influence land use.

Apart from strategic plans and land use plans that emanate from execution of strategic planning and land use planning, the concept of integrated development planning or Plans(IDP) has recently become a centre piece of planning in an urban area. Urban planning often depends on various land use and integrated development plans and programmes, prepared at national and county levels, to ensure effective service delivery in urban areas. It is within such plans and programmes that urban agriculture activities are often considered for inclusion in planning. In the local context in Kenya, both strategic and land use planning usually lead to development of a number plans and programmes namely; County Integrated Development Plan (CIDP), Integrated Development Plan (IDEP), Annual Development Plan (ADP), Local Physical and land Use Development Plan(LPLUP), County Spatial Plan, Integrated Strategic Urban Development Plan (ISUDP and the Municipal plan. However, urban agriculture is not considered as a land use category hence not fully included plans and programmes, as some stakeholders view the practice as a Locally Unwanted Land Use (LULU). Intergrated development plans (IDP) play a number of critical roles in planning namely: Provision of strategic guidance to municipalities, linking and

coordinating the many different plans and planning processes(Harrison,2001), operationalizing and alignment to constitutional and legislative statutes (Mashamba,2008), and acting as main tool for strategizing and ensuring accountability regarding planning and delivery of developmental projects (Odeku,2021).

However, the implementation of integrated strategic plans is often faced with a number of challenges that reduce their effectiveness. These include: Shortage of resources, incomplete projects, inadequate community participation, political meddling and limited capacity (Aklilu & Makalela,2020). Also, Harrison (2001) assert that some of the challenges facing implementation of strategic plans include; failure of many local councils to accept ownership of consultant-prepared IDPs, and use them in budgeting processes; continued lack of integration and linkage between the IDP and planning within other spheres of government; poor quality of analyses and reports produced by many ill-prepared planners (whose traditional focus was on spatial planning rather than development planning); poorly constructed participatory processes; institutional conflicts around planning issues involving officials (often resistant ); the poor linkage between the IDPs with their broad spatial frameworks, and poor linkage between planning processes at district and local scales; and difficulties in linking planning and budgeting processes with varying time.

#### **2.4.3.3 Public Participation in Plans and Programmes**

Public participation often has some key concerns that need to be addressed for its effective implementation. Public participation is one of the key challenges to inclusion of urban farmers in urban plans and programmes. (Aklilu & Makalela,2020; and Harrison, 2001). Quick & Bryson (2022) defines public participation in governance as involvement of direct or indirect involvement of stakeholders in decision-making about policies, plans or programs in which they

have an interest. The study identifies key concerns in public participation as: what constitutes legitimate and useful public participation; the relationships among diversity, representation, and inclusion; the appropriate influence of different kinds of knowledge; and how to align participation methods and contexts.

On perception and understanding of public participation by public administrators, Eckerd & Heidelberg (2020) posit that participation and administration have long had an uneasy coexistence. On one hand, public participation in decisions that affect citizens is consistent with citizenship and democracy; on the other hand, much of what government does is complex and requires some level of technical understanding to make decisions. This study investigated the public administrators' perceptions of public participation and the ways that they understand the participation process, which found out that public participation is managed by public administrators; they determine the extent of participation, shape the ways that the participation takes place, and decide whether or not participation is valuable for their work. In some cases, the process is rather democratic, whereas in others, it is not. Also, it is up to administrators to shape the spaces for participation and select the participants in a manner consistent with their understanding of the task to be accomplished.

Othman, et al (2017) carried out a study on expectancy in urban farming engagement in Malaysia, which aimed at measuring urban farming participation motivations using the Expectancy Theory of Motivation which is made up of three aspects; namely expectancy, instrumentality and valence. Despite the efforts by the government, there is lack of public participation in urban farming activities and challenges in sustaining urban farming participants' interest. The findings indicated that the urban farmers in the study participated in urban farming because they expected resulting social, health, environmental and economic benefits. Thus, local

authorities may be able to contribute to increasing urban farming participation by several initiatives including an effort to publicize the benefits of urban farming to both participants and non-participants.

Similarly, Rezai, et al (2014) conducted a study with the aim identifying the key factors that influence public involvement in urban agricultural activities in Malaysia. A total of 640 households were interviewed via a structured questionnaire. Exploratory factor analysis was carried out. The results show that society recognition, attitude and the social impact of urban agriculture are the top three considerations for individuals participating in urban agricultural activities. The results show that there are six factors that explain the different dimensions of individual participation in urban agriculture including: society recognition, attitude, social impact, economic impact, health impact and knowledge. The ways respondents' social cycle view and judge them will directly influence their involvement in urban agricultural activities. The study reveals that urban agriculture portrays several opportunities such as employment, income, and health and food security, and therefore deeper insight into the social, economic and health impact of urban agriculture can build a strong and convincing purpose for engagement in urban agriculture.

However, in terms of challenges, studies have also shown that there are a number of factors and reasons that affect urban farming. Othman, *et al* (2020) carried out a study that aimed at identifying deterrent factors in urban farming participation. As urban farming remains to be promoted by municipal governments and others, it is essential to understand how to ensure these projects are viable. It is important to identify the deterrent factors that hinder the "community buy-in" in the urban farming projects and how to overcome the problem so that "community buy-in" in the urban farming project will be achieved and sustain in the future. The findings



show that the top three most deterrent factors that hinder people from participating in urban agriculture projects are; land and the environments-which is the main deterrent, time factor" is the main deterrent reason why the community is not interested in the urban farming project, and lastly, knowledge factor. The study suggests ways of increasing participation in the urban farming programs as: Implementing the design and planning in the garden to enhance the image and aesthetic value of the neighborhood, and creating more linkages and cooperation with local and international agencies for funding purposes.

Quick & Bryson, (2022) have identified key concerns in public participation have been identified as what constitutes legitimate and useful public participation; the relationships among diversity, representation, and inclusion; the appropriate influence of different kinds of knowledge; and how to align participation methods and contexts. Even more interesting is the finding by Eckerd & Heidelberg (2020) that administrators determine the extent of participation, shape the ways that the participation takes place, and decide whether or not participation is valuable for their work. In some cases, the process is rather democratic, whereas in others, it is not. Also, it is up to administrators to shape the spaces for participation and select the participants in a manner consistent with their understanding of the task to be accomplished. However, there is a literature gap, with regard to how public participation has been executed in urban agriculture programmes, particularly in the rapidly growing towns of Kisumu, Kakamega and Eldoret. The foregoing studies (Othman, *et al*,2017 and Rezai, *et al*,2014) were all conducted in Malaysia but show there are some key factors and reasons that influence engagement or participation in Urban agriculture which include; social, health, environmental and economic benefits (Othman, *et al*,2017). Indeed, the three top considerations for individuals participating in urban agriculture include; society recognition, attitude and the social impact of urban agriculture. However, the

different dimensions of individual participation in urban agriculture are explained by six factors namely: Society recognition, attitude, social impact, economic impact, health impact and knowledge (Rezai, *et al*, 2014). Participation in urban agriculture programmes and projects was also found to be affected by three top most deterrent factors including; land and the environments, time and knowledge factor (Othman, *et al*,2020; Quick & Bryson, 2022; and Eckerd & Heidelberg 2020). In summary, the foregoing literature review, shows that there is a dearth of literature on understanding on how urban agriculture is facilitated through planning strategies, plans and programmes in the study areas.

## **2.5 Summary of Literature and the Study Gap**

Institutional frameworks including planning administrative frameworks and planning legislative framework have been documented as effective in managing land use problems associated with widespread urbanization (Viet et al, 2009; UN Habitat, 2018). Indeed, scholars (Freisinger et al, 2015; Horst et al, 2017; Sarker et al, 2019) have documented diverse success in employing administrative framework for enhancing urban development including agricultural practices in some cities in Europe. At the same time, several studies (Walsh, 2012; Erickson et al, 2013; Buxton et al, 2016; Pantić et al, 2018) have revealed various weaknesses in planning administrative frameworks that seem to hamper urban development planning. This holds the notion that administrative framework bodies even in the developed cities have had heterogeneous influence on urban development practices among stakeholders.

Studies focusing on planning administrative planning governance framework (Stojanović et al, 2016; Fuseini, 2016; Abiodun, et al, 2018) have illustrated mixed outcomes with regards to various development outcomes. Stojanović et al (2016) revealed that there is no one-size-fits-all model of good governance promoted as a universal mantra of sustainable

development. On the other hand, Fuseini (2016) showed that urban governance has not been effective in promoting sustainable urban development. Similarly, results in Abiodun, et al (2018) indicated that incessant conflicts between town planners and political leaders charged with governance, particularly the opposition of the political elites and the urban poor within the city. The reviewed studies on governance suggest inconsistency on urban development outcome.

Reviewed literature has highlighted that urbanization, the population explosion and the high rates of immigration into cities caused an intensification of the use of available space (Losada et al, 2015; Mativo, 2015; Sarker et al, 2019). Researchers (Wapwera et al, 2015) have documented that planning legislative framework has provided a guide which planning administrative frameworks use as regulatory and pro-active interventions in developed countries to ensure adequate planning procedure are followed. However, majority of the studies (Atamewan, 2019; Bonye et al, 2020; Omollo, 2020; Onaiwu, 2020) have revealed that most urban developers do not comply with set regulations for controlling various development investments particularly building codes. This illustrates that planning regulation frameworks hardly achieved compliance from investors or developers

## **2.6 Theoretical Framework**

The theoretical framework of the study was modelled on the institutional theory, although the three theories were reviewed which included; regulatory compliance, general systems and institutional theory.

### **2.6.1 The Theory of Regulatory Compliance**

This study was guided by the Theory of Regulatory Compliance (TRC), which supports the need to comply with regulations. Fiene (2016) posits that TRC materialized in the 1970s when its

protagonists argued that compliance with the sanctioning rules or regulations significantly contributes to positive results. The theory tries to link compliance with regulations to best practices by stakeholders (Bassey, 2020). According to Fiene (2016), this relationship is curvilinear rather than linear, denoting that full compliance with all rules was not necessarily a good policy and that all rules or regulations are not created in equal. This therefore calls for the right balance of rules, where oversight is based upon specific (as opposed to general) risk and predictive targeting of specific rules or regulations (Mbago, Ntayi & Muhwezi, 2016).

The theory of regulatory compliance has, otherwise, received a significant share of criticism. For instance, Étienne (2010) argues that the issue of compliance has largely been overlooked by policy formulators and implementers. It is very difficult to measure whether target population is behaving the way policy makers intended them to behave.

According to Weske, Boselie, van Rensen and Schneider (2018), compliance should be encouraged through technical and financial support, education and other inducements. The regulatory compliance theory seems to highlight coercive enforcement style, based on the assumption that individuals are unwilling to comply with regulations and that they must be compelled to do so by imposing sanctions for those out of compliance (Bassey, 2020). From this perspective, individuals comply because they fear the consequences of being found in violation (Weske et al, 2018). In the regulatory enforcement literature, it is argued that neither of the approaches should be overdone; an entirely persuasive approach runs the risk of amoral calculators who take advantage by breaking the rules, whereas an entirely coercive approach could lead to negative consequences such as decreasing involvement with regulation and the withholding of information (Mbago et al, 2016). Nevertheless, the theory of regulatory compliance has been employed in studies focusing on diverse sectors. Bassey (2020) used the

compliance theory in assessing adherence to environment regulations. In other studies, focusing on procurement field, individual's social relations, group think, expected utility, perceptions of procedural justice and legitimacy of the public law (Ntayi et al., 2012), media publicity, organizational culture, political interference, moral obligation (Tukamuhabwa, 2012), familiarity with the procurement regulations (Eyaa and Oluka, 2011) were significant predictors of compliance. On the other hand, Weske et al (2018) employed regulatory compliance theory to explain compliance with quality and patient safety regulations.

In the current study, the theory reinforces why urban development partners should comply with the planning frameworks that regulates business, residential and industrial sites. To link the theory with the applicable planning framework in urban centres and cities, Rule 12 (2) (a-b) of the Physical Planning Rules of 1998 (Building and Development) (Control), issued by the Government of Kenya (1998) as legal notice number 135/1998 has set the minimum width of building lines that developers ought to comply with. To ensure the implementation of this regulation, section 56 (a) of the Physical and Land Use Planning Act (PLUPA) ,(Kenya, 2019) gives the county governments the power to control the use and development of land and buildings to ensure orderly development. This underpins the application of the TRC in enforcing compliance with the planning standards that regulate buildings, business sites and premises.

### **2.6.2 The General Systems Theory**

The General Systems Theory was espoused by Von Bertalanffy (1956). General System Theory is defined as a complex of interacting components that together have the characteristics of an organized whole (Johnson, 2019). Mwangeka (2020) argues that, as a practicing biologist, Bertalanffy was interested in developing the theory of “open systems” in an attempt to understand how systems exchange matter with the environment as observed in every ‘living

system'. The theory focuses on interactions as the centre of relationships that lead to sustained behaviour of a single autonomous element which is different from its behaviour when the element interacts with other elements (Drack& Pouvreau, 2015).

The systems theory focuses on three levels of observations: the environment, the social organization as a system, and human participants within the organization (Lai & Lin, 2017). According to Johnson (2019), control, feedback, emergence, holism and the notion of a hierarchy of systems form the tenets of GST. Control reflects centralised management (administration), feedback is seen in interactive communication, while interactions with the environment forms emergence. All these activities are in one organization (holism) with defined structure of authority (hierarchy of systems). Mutale *et al* (2016) opine that systems theory underscores the importance of looking at systems from a broader perspective rather than simple parts, which make up the system. The concept is that systems cannot be reduced to a series of parts functioning in isolation, but that, in order to understand the whole, one must understand the interrelations between these parts (Anderson, 2017).

Urban development attracts players from diverse backgrounds who are guided by unitary town plans. Viewing the developers under the lenses of different systems which are brought together by specific planning frameworks should best be done within the ambit of the General Systems Theory.

### **2.6.3 The Institutional Theory**

The main theory anchoring this study was the institutional theory advanced by John W. Meyer, a sociologist best known for development of neo- institutional perspective on globalization. Scott (2004) defined institutional theory as policy making that emphasizes the formal and legal aspects

of government structures. Lawrence and Suddaby (2006) argue that it is a theoretical framework for analysing social (organizations) phenomena, and views the social world as significantly comprised of institutions.

Scott, (2008) asserts institutional theory has three key elements namely; regulative, normative and cultural-cognitive pillars, that together with associated activities and resources, provide stability and meaning to social life. Regulative pillar refers to the fact that institutions must follow rules, laws and sanctions according to societal expectation, while normative pillar is about the institutions working in a proper way or normally to behave and perform following their own established norms and values as per societal expectations. Lastly, the cultural –cognitive pillar refers to the ‘taken for granted “way of doing things in institutions i.e., the culture. In the present study, regulatory pillar represents the planning legislative framework comprising of the constitution of Kenya, national policies, national legislations, county legislations and by-laws. The normative pillar represents the planning administrative framework comprising of governance, organization and administration of planning, while cultural-cognitive pillar represents the way urban agriculture is practised and managed by planning authorities.

Institutional theory is a widely accepted theoretical posture that emphasizes rational myths, isomorphism, and legitimacy (Scott, 2008). Rational myths are social thoughts and actions which have taken rule like status as a result of institutionalization of social processes, obligations, or actualities, while legitimacy refers to the practice of sustainable practices seen by stakeholders as being proper and appropriate DiMaggio and Powell, (1983). According to DiMaggio and Powell (1983), isomorphism is a "constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions".

In the present study, rational myths in urban agriculture could include notions such as urban agriculture being a cultural, retrogressive and rural activity that cannot be practised in urban area, Not in My Backyard (NIMBY) and agriculture, including urban agriculture, can only be practised in large tracks of land. These social thoughts may have been institutionalized in people and are therefore a hindrance to planning of urban agriculture. On the other hand, legitimacy relates to planning authorities which must undertake their core functions based on certain laid out policies, legislations and procedures as a best practice. Lastly, isomorphism would be about populations practising urban farming in any town or urban areas, being constrained to work within urban planning laws and regulations.

Usually, an institution must meet societal expectations in three possible ways in order to achieved isomorphism. Isomorphism is categorized as coercive, mimetic and normative. Coercive isomorphism refers to change that results from pressures exerted by political influence or by outside organizations considered as legitimate, while mimetic isomorphism is defined as uncertainty and ambiguity about goals or technology that increases the practice of imitation conducts. Normative isomorphism refers to influence of individuals belonging to the same profession or those that have followed the same educational processes (norm groups) thereby accelerating similarities (DiMaggio and Powell (1983). Apart from isomorphism, whereby intuitions change to resemble other institutions facing the same environmental conditions, the institutional theory also operates on another dimension known as decoupling, whereby there is a separation from the formal institutional and actual practices of the organizations, (Scott, 2008).

The theory was used by Jean-Claude Theonig (2011) in studying institutional theories and public institutions, where it was concluded that institutional theories have become leading and widely shared references in public administration. Institutional theory has been used in a number of



studies relating to agriculture, tourism and management among others. Guy (2000) conducted a study on problems and prospects of institutional theory which asserts that critics of institutional theory often argue that, even if institutional theory does constitute a good place at which to begin the institutional analysis, they are not such a good place to end it.

Glover et al (2014) applied institutional theory to explore the role of supermarkets in the development of legitimate sustainable practices across the dairy supply chains, which revealed that, whereas some organizations wished to pursue a sustainable agenda, by integrating new rules and legitimate practices, the dominant logic was that of cost reduction and profit maximization, hence government should complement the dominant logic with sustainable practices across supply chain. Palthe (2014) used institutional theory to explore the role of three elements involved in the management of change - regulative, normative, and cognitive, which revealed that while organizational change traditionally deals with challenges associated with changing technologies, structures, and employee abilities, effective change also depends on the values and behavioural reasoning that originate in the institutional context – whether people have to change, ought to change, or want to change.

However, in adopting this theory, it is noteworthy to say that the theory has a number of significant theoretical and methodological problems, which include the static nature of institutional explanations and general difficulties in planning administrative framework assuring institutional variables in other than simplistic, nominal categories. However, considering institutionalization as a continuous variable rather than a nominal variable brings a better understanding of the dynamics of institutions hence help develop better institutional explanations for other social and political phenomena. As applied in this study, the theory holds that the institutional framework would influence the practice of urban agriculture. This is true

considering the fact that institutional framework is comprised of both regulative elements such as policies, legislations, rules and regulations and normative elements for proper behaviour and performance of institutions, that tend to influence the cultural–cognitive practices in urban agriculture. Although the three theories discussed under this section all appear to be applicable to the study, the institutional theory was used as the main theory, since it appears to cover all the elements of the other two theories hence more inclusive. The institutional theory has three main pillars which include; regulatory, normative and cultural-cognitive pillars. Theory of Regulatory Compliance (TRC) can be considered as part of regulatory pillar, while the General Systems Theory (GST) with its three levels of observations; environment, social system of an organization and human interaction in the organization, all tend to be falling within the normative and cultural-cognitive pillars of the institutional theory.

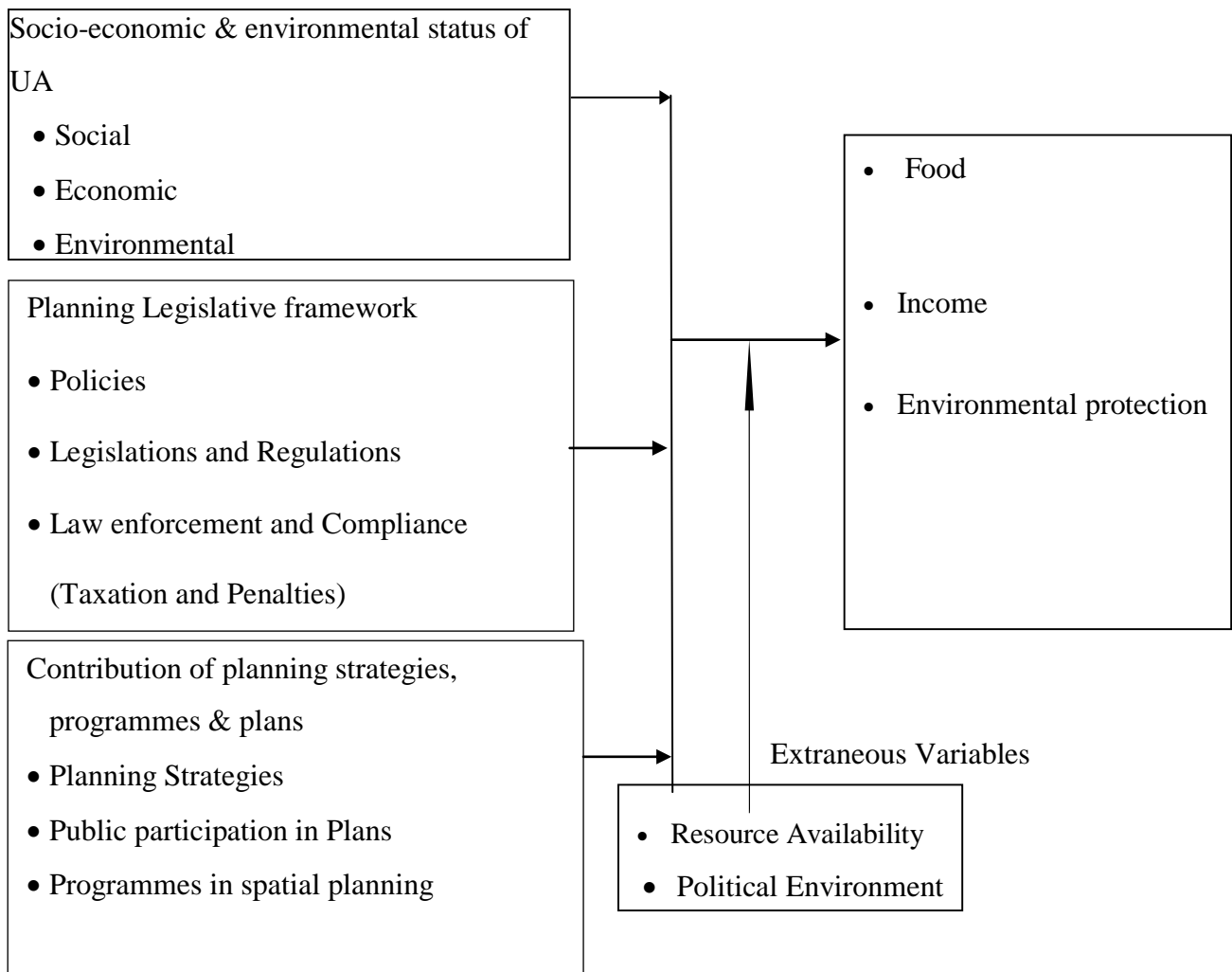
## **2.7 Conceptual Framework TC "2.4 Conceptual Framework" \f C \l "1"**

The conceptual framework of this study was built around the institutional theory, which was the main theory of the study. Regulative, normative, and cognitive social systems have all been identified by theorists as central elements of institutions, and that these elements act together in mutually reinforcing ways to contribute to the institutional context (Scott, 1995& Palthe, 2014). This study internalized the three key elements of institutional theory namely; regulatory, normative and cultural cognitive pillars as follows: The cultural-cognitive pillar was investigated through an appraisal of the socio-economic and environmental status of urban agriculture, while the regulatory pillar was applied to create a better understanding of the effect of planning legislative framework on urban agriculture. Lastly, the normative pillar of institutional theory was largely analysed in terms of the contribution of planning strategies, plans and programmes to urban agriculture in the three towns in Western Kenya. This study therefore

conceptualized that urban agriculture must be practiced sustainably to enable it play its critical socio-economic and environmental role, in provision of food and income to urban farmers. The planning institutional framework is viewed as comprising of planning legislative framework and its derivative planning strategies, plans and programmes, with the influence of these two key aspects of planning institutional framework on urban agriculture being the focus of this current study.

**Independent Variable  
Planning Institutional Framework**

**Dependent variable  
Urban Agriculture**



**Figure 2.1: Conceptual Framework showing relationship between the planning institutional framework and urban agriculture (Source: Author's Diagram)**

Figure 2.1 illustrates the relationship between planning institutional framework and urban agriculture. In the figure, the independent variable is the planning institutional framework which include the socio-economic and environmental status of urban agriculture in planning, planning legislative framework, and planning strategies, plans and programmes. The dependent variable was urban agriculture being realized in terms of its socio-economic and environmental contributions to urban farmer's households. The planning legislative framework was comprised of policies, legislations and regulations, and law enforcement and compliance including taxation and penalties. on the other hand, planning strategies, programmes & plans were analysed in terms of, their contribution to urban agriculture. However, the relationship between the independent and dependent variable was affected by extraneous variables which included resource availability and political environment.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

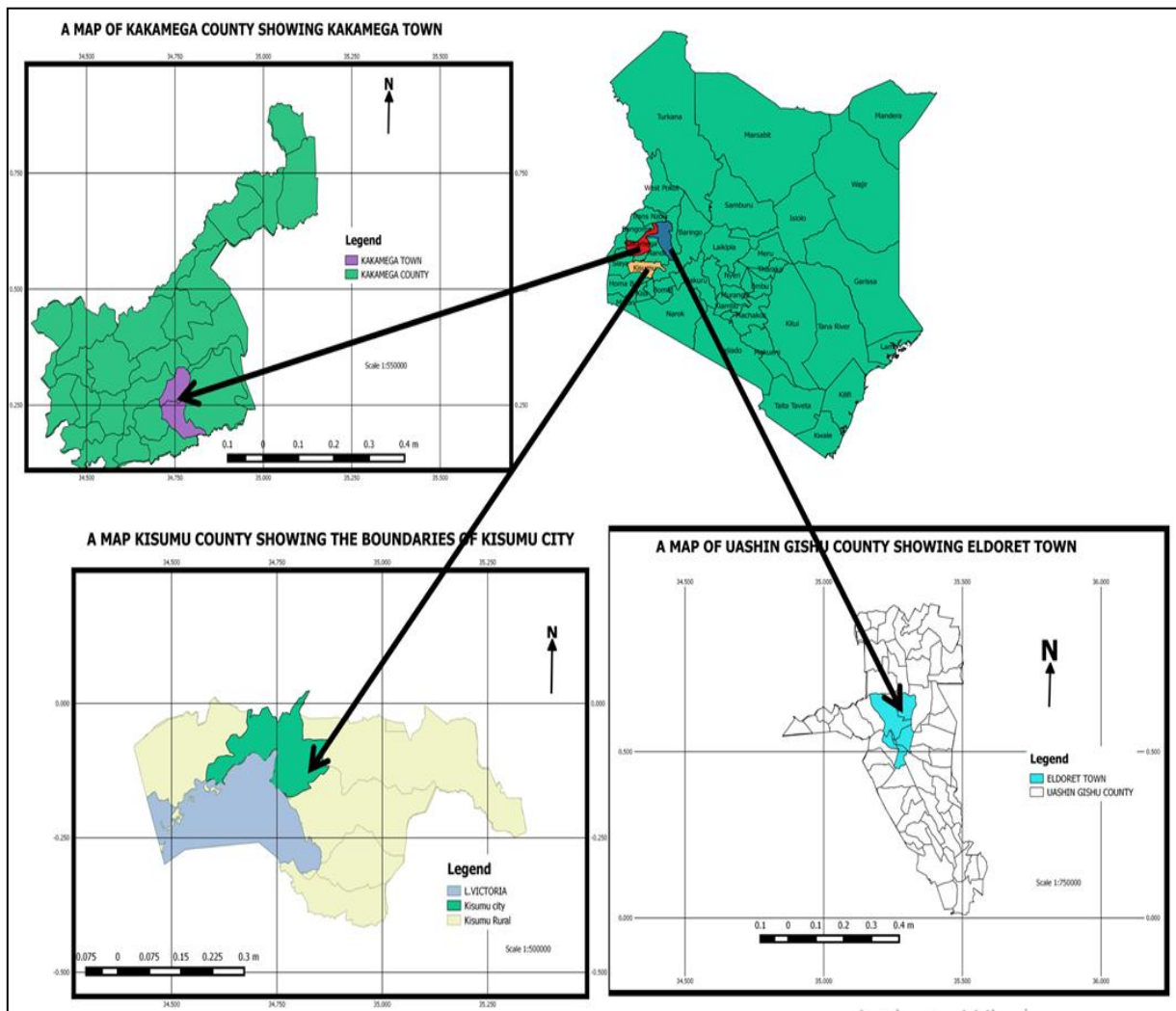
This chapter covered systematic issues in research such as the study area, research design, study population and sampling, data collection methods, data analysis and results presentation, reliability, and validity of instruments. The research methodology was important in ensuring that the results of the study were reliable, valid, and accurate.

#### 3.2 Study Area

The study area included the urban centres of Kisumu, Kakamega, and Eldoret towns situated within counties in Western Kenya, (Figure 3.1). The rationale for choosing Western Kenya and the three study areas was threefold: First, Western Kenya region falls within the northern shores of Lake Victoria in Kenya, where over 600% increase in urban land (urban expansion) is forecasted in Africa by 2030, (Güneralp et al, 2017). It can be argued that increase in urban expansion will directly lead to urbanization challenges, including increase in urban agriculture activities. Secondly, Western Kenya also plays host to the three identified towns in Kenya's Vision 2030, namely Kisumu, Kakamega, and Eldoret, where implementation of flagship projects on urbanization and housing will be undertaken, (Kenya, 2007). Third, the choice for the three study towns was supported by findings of other researchers on urban agriculture, that the global focus on urban agriculture should not just be on large cities exclusively, but also target smaller or medium-sized towns or cities that offer the greatest potential in terms of physical space (Martellozzo *et al*, 2014).

The three identified towns are mostly municipality towns and cities, with fast-growing and dynamic populations, which are faced with ever-increasing urban populations, urban expansion,

and accompanying problems of urbanization. Africa is the fastest urbanizing continent, with urbanization rate projected to reach 60% by 2050 (UN-Habitat, 2017), while Kenya will achieve 46 % urbanization by 2050(Güneralp et al, 2017; UN-habitat, 2018). Based on this urban expansion forecast, the study used Africa’s urbanization rate of 60% as the baseline for categorizing towns in Western Kenya, depending on their percent contribution to the county urban population. Three categories were identified namely; category one (I) with percent urbanization contribution of between 0-60%, category two (II) with 60-90%, and category three (III) with Above 90%.



**Figure 3.1: Map Showing Kenya, and locations of towns of Kakamega, Kisumu & Eldoret**

The study used an inclusion and exclusion selection criterion comprising of the following factors; location in a dominant Agro-Ecological Zone (AEZ) unique from the others, county headquarter towns within former Nyanza, Western and neighbouring towns of Rift Valley, and contribution of urban population of the specific town to total urban population in the hosting county. The urban centre/town with the highest percent urbanization per category was accepted while the rest that did not meet the criteria were rejected, (Table 3.1). In category I, Kakamega was identified as a study area because it was the highest contributor to county urban population (58%), Category II was taken up by Kisumu (90%), and category III by Eldoret (93%), as indicated in Table 3.1.

**Table 3.1: Inclusion and Exclusion Selection Criteria for study towns in Western Kenya**

Category	Town/City	Host County	Dominant AEZ where town is located	County Urban Population	Urban pop. of specific town	% Contribution to County urban population	Accept/Reject (Highest % contribution per category)
0-60%	Mbale	Vihiga	UM1	58,384	11,404	20	Reject
	Siaya	Siaya	LM2	85,417	33,153	39	Reject
	Bungoma	Bungoma	LM2	190,112	68,031	36	Reject
	Homabay	Homabay	LM3	113,079	44,949	40	Reject
	Migori	Migori	LM2	167,410	71,668	43	Reject
	Nyamira	Nyamira	UM2	47,036	24,483	52	Reject
	Kericho	Kericho	LH1	93,538	53,804	58	Reject
	<b>Kakamega</b>	<b>Kakamega</b>	<b>UM1</b>	<b>185,340</b>	<b>107,227</b>	<b>58</b>	<b>Accept</b>
60-90%	Busia	Busia	LM1	113,753	71,886	63	Reject
	Kapsabet	Nandi	UM3 & LH2	59,479	41,997	71	Reject
	Kisii	Kisii	UM1	151,410	112,417	74	Reject
	<b>Kisumu</b>	<b>Kisumu</b>	<b>LM3</b>	<b>440,906</b>	<b>397,957</b>	<b>90</b>	<b>Accept</b>
Above 90%	Kitale	Transzoia	UM4	178,734	162,174	91	Reject
	<b>Eldoret</b>	<b>Eldoret</b>	<b>LH3</b>	<b>510,205</b>	<b>475,716</b>	<b>93</b>	<b>Accept</b>

(Source of data: Kenya, 2019)

### **3.2.1 Location, Climatic, Bio-Physical, and Socio-Economic Characteristics of Study Area**

The three study towns had different characteristics which may have influenced urban agriculture as follows;

#### **3.2.1.1 Kisumu Town**

Kisumu town is situated in Kisumu county which lies between longitudes 33 020'E and 350 20'E and latitudes 00 20' South and 00 50' South. The county is bordered by Homa Bay county to the South, Nandi to the North East, Kericho to the East, Vihiga to the North West, Siaya county to the West, and surrounded by the second largest freshwater lake in the World; Lake Victoria. The county covers approximately 567 km<sup>2</sup> on water and 2086km<sup>2</sup> land area.

According to Kenya, (2019), the total projected core urban population for Kisumu city was 440,906 persons by the year 2019. The active labour force (15-64 years) consists of 54.78 percent men and 45.22 percent while the youth age group (15-35 years) was 42.2% by 2019. The wage earners/ self-employed people accounted for 87.5 percent of the labour force, (Kenya, 2019). The city has good infrastructure with mostly bitumen surface (tarmac) roads and a few gravel and earth surface roads, an international airport, and a railways line.

The county's topography is undulating and characterized by plain lands in the eastern part which is a flat stretch lying on the floor of the Rift Valley, and the overhanging huge granite rocks at Riat hills. Due to flash flooding, the eastern part comprising Kano Plains has rich alluvial soils which favour agricultural production in horticulture and rice. Granites, on the other hand, find their use essentially in the building and road construction industry. The town is endowed with the second largest freshwater lake in the world known as Lake Victoria, with two major rivers; Kibos and Kisian in its catchment. These resources provide a big potential for development of



the blue economy. Parts of the town in Kisumu East are predominantly black cotton soil which is poorly drained and unstable though suitable for rice, horticulture, and sugarcane production. Kisumu West Sub-County and parts of Kisumu Central are predominantly red-loamy soils suitable for agricultural production. The lake shores are generally swampy and offer fertile ground for horticulture and fish breeding.

The climate of Kisumu town is generally warm with minimal monthly variation in temperatures between 23°C and 33°C throughout the year. The rainfall is determined by a modified equatorial climate characterized by long rains (March to May) and short rains (September to November). The average annual rainfall varies from 1000-1800mm during the long rains and 450-600mm during the short rains. It experiences a humid climate falling within the agroecological zone of lower Midland three (LM3), which is a semi-humid zone (Kenya, 2017a).

The temperature ranges between 18° C to 35 ° C. The soils are dominated by lake sediments, commonly sand and clay soils. The mean agricultural parcel size is 1acre. The percentage of land with title deeds in the county is 61.3 percent, (Kenya, 2017a). The city had a fairly high literacy level of 83.1% of the population and a poverty rate standing at 47.8% by 2022, (Kenya, 2019; Kenya, 2017a). The altitude varies from 1,144 meters above sea level on the plains to 1,525 meters above sea level in the Maseno and Lower Nyakach areas. This greatly influences temperatures and rainfall in the municipality. It is noteworthy to observe that the rainfall is adequate and evenly distributed for small-scale food-crop production and cash-crop growing.

### **3.2.1.2 Kakamega Town**

Kakamega is the headquarters of Kakamega county lying about 30 km north of the Equator, with a population of 1,867,579 (Kenya, 2019). The town is situated 52 km north of Kisumu, the tenth

largest city in Kenya. The altitudes for Kakamega range from 1,240 metres to 2,000 metres above sea level. The southern part of the town is hilly and is made up of rugged granites rising in places to 1,950 metres above sea level. The Nandi Escarpment forms a prominent feature on the town's eastern border, with its main scarp rising from the general elevation of 1,700 metres to 2,000 metres. (Kenya, 2017b).

Kakamega has an annual rainfall ranging from 1280.1mm to 2214.1 mm per year. The rainfall pattern is evenly distributed all year round with March and July receiving heavy rains while December and February receive light rains. The temperatures range from 18 0C to 29 0C (Kenya, 2017b). The town has an average humidity of 67 percent. The population of Kakamega town according to National Census (Kenya, 2019) is 682, 717 and Lurambi Sub-County is the most densely populated part of the town with a population density of 1,305. This high population density can be attributed to urbanization and several higher learning institutions within. High population density, especially in Lurambi Sub-County and other urban areas comes with subdivision of land into uneconomical sizes, high levels of unemployment, and pressure on the available infrastructural and social facilities. This calls for strategies like urban agriculture to address these shortcomings.

### **3.2.1.3 Eldoret Town**

Eldoret town is the headquarters of Uasin Gishu County. The town extends between longitudes 34° 50' east and 35° 37' east and latitudes 0° 03' South and 0° 55' North. It covers a total of 1,125 Km<sup>2</sup>. The population density is between 424 persons per km<sup>2</sup> and 661 persons per km<sup>2</sup>. (Kenya, 2017c). Eldoret town is situated in a highland plateau. Altitudes fall gently from 2,700m above sea level at Timboroa in the East to about 1,500m above sea level at Kipkaren in the West. The topography is higher in the east and declines towards the western borders. The plateau

terrain in the county allows easier construction of infrastructures such as roads and use of modern machinery for farming. The town is within the Lake Victoria catchment zone and therefore all the rivers from the county drain into Lake Victoria. The major rivers which provide water for livestock, domestic and industrial use include; Moiben, Sergoit, Kipkarren, Chepkoilel, and Sosiani.

Uashin Gishu is divided into three zones namely: the upper highlands, upper midlands, and Lower highlands. These zones have greatly influenced the land use patterns in the county as they determine the climatic conditions of an area. The geology of the county is dominated by tertiary volcanic rock, with no known commercially exploitable minerals, (Kenya, 2017c).

There are four main soil types in the county; red loam, red clay, brown loam, and brown clay. The red loam soils are found mainly in the northern part of the county in Turbo, Moi's Bridge, and lower Moiben and this type of soil mainly support maize, sunflower, and cattle farming. The red clay soils occur around Soy, upper Moiben, and Nandi border areas and they support wheat and maize growing, and the natural vegetation is similar to that of the areas with red loam soil. The brown clay soils occur mainly on the plateau and cover most of the upper Lessos plateau areas and are good for rearing livestock. Deep brown loam soils occur in high-altitude areas of the county around Ainabkoi and Kaptagat that are good for forestry, dairy farming, and wheat, pyrethrum, potato, oat, and barley farming. The town experiences a high and reliable rainfall with an average annual rainfall ranging between 624.9mm-1560.4mm. It occurs between the months of March and September with two distinct peaks in May and August. The dry spells start in the month of November and end in February. Average temperatures range between 70C and 290C. The rainfall and temperatures in the county are conducive for both agriculture and livestock farming. The average land holding size in the town is 0.1Ha. Most of the land holding

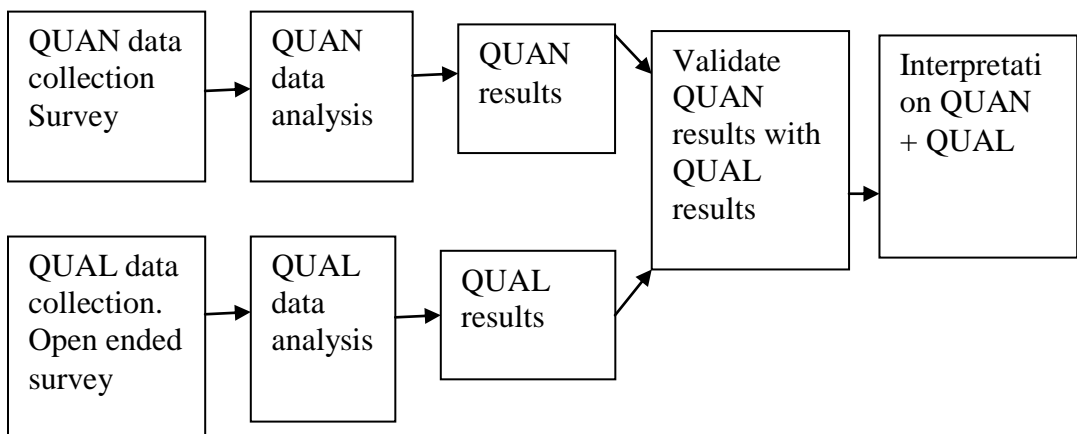
in the county is private with about 95 percent of the entire land with title deeds. The type of land tenure in the county is 90 percent freehold and 10 percent leasehold. Operationalization of the county Spatial Plan should guide land use and management to ensure the long-term quality of land which is a key resource in the development process of the town (Kenya, 2017c).

There are varied land use practices across the town classified into farmland, built-up land, and conservation land. The spatial spread of the land cover is mainly influenced by the physiographic characteristics of the town, and the level of service provision. Urbanization and population dynamics have led to a variation in land use patterns over the last few years. The built-up land covers the largest proportion of the total land area of the town is 524Km<sup>2</sup> of total land; conservation land covers 36 Km<sup>2</sup> and farmland covers about 2.49 percent of total land.

### **3.3 Research Design**

This study adopted a mixed-methods research approach utilizing both quantitative and qualitative methods of data collection and analysis. A research design provides a framework for the collection and analysis of data. A choice of research design reflects decisions about the priority given to a range of dimensions of the research process such as data collection methods, data analysis methods, and interpretation and presentation of the analyzed data (Saunders, Lewis, and Thornhill, 2009). In this study, a mixed method approach using concurrent triangulation research design was used which involved concurrent triangulation, collection, and analysis of quantitative and qualitative data separately yet concurrently, and giving equal priority to both types of research. Quantitative and qualitative data were collected separately and concurrently using closed and open-ended questions respectively. Data analysis and results were also obtained separately and concurrently then quantitative results were validated with qualitative results before interpretation of both quantitative and qualitative results was to done to obtain the

findings. The mixed-methods approach involves gathering both numeric information using questionnaires as well as text information using interviews so that the final database represents both quantitative and qualitative information (Creswell, 2012). Onwuegbuzie *et al* (2007) state that mixed method approach offers a bridge and a continuum by using quantitative methods to measure some aspects of the phenomenon under study and qualitative methods for others. This approach provided for complementarity and diversity in data collection and interpretation, hence bringing together the differing strength and non-overlapping weaknesses of quantitative methods with those of qualitative methods (Creswell, 2014). Qualitative designs tend to collect data that is open-ended without predetermined responses while quantitative designs usually include closed-ended responses such as found in questionnaire instruments (Saunders et al, 2009). The design was deemed appropriate by the researcher because the study directly compared and contrasted quantitative statistical results with qualitative findings, thus gaining from the concept of concurrent triangulation as presented in Figure 3.2



**Figure 3.2: Concurrent Triangulation Design (Source; Creswell, 2014)**

Figure 3.2 illustrates that the study used Quantitative (QUAN) and Qualitative (QUAL) data collection methods, and Quantitative (QUAN) as well as Qualitative (QUAL) data analyses, thereby obtaining both Quantitative (QUAN) and Qualitative (QUAL) results. The two types of

results were merged at the point of interpretation of the study findings to aid validation of the quantitative results. Success in triangulation demands a careful analysis of the type of information provided by each method, including its strengths and weaknesses. In mixed method design involving concurrent triangulation, quantitative and qualitative data collection and analysis are conducted separately yet concurrently, and equal priority is given to both types of research (Creswell, 2014).

### **3.4 Targeted Population and Sampling**

The target population was the farming community in cities/towns. The unit of analysis was the urban farmer who was practicing urban farming in towns. The study population comprised four hundred and forty (440) urban farmers. Information for triangulation was obtained from twenty-four (24) Focus Group Discussion(FGD) participants; twelve (12) Key informants comprising three (3) county Directors of Physical planning, three (3) town/city planners, two (2) chief officers; two (2) County directors for agriculture and two (2) County directors of Livestock. The total study population was therefore four hundred and seventy-six (476) respondents. The urban farmers were obtained from the county department of Agriculture and were targeted because they were the ones whose farming practices were influenced by institutional frameworks. They were therefore expected to explain how they have been interacting with planning institutional framework within the towns where they were operating.

On the other hand, officials of farmer groups were targeted to participate in focus group discussions (FGD), because they often represented farmers, particularly during stakeholder meetings, where they participate in articulating urban farmers' issues. They were therefore expected to be in a position to explain how the existing frameworks influence UA practices from the point of view of their members (urban farmers). Similarly, the study targeted county directors

of agriculture, county directors of livestock, and planners because these are officials who were charged with implementing the institutional frameworks and enforcement of town regulations. They were therefore expected to be better placed to provide information related to how by-laws affecting UA practices were enforced based on their experiences.

The planners were targeted because, being experts in planning, they were expected to provide critical information concerning how planning institutional frameworks under their dockets had influenced UA practices. The county Directors of Agriculture were also expected to provide ratings of how UA had influenced social, economic as well as environmental well-being of the farming families. Similarly, the town planners/managers who are officials directly concerned with implementing town plans were expected to provide information regarding how the plans had influenced UA practices. Similarly, all the directors of agriculture and livestock were included in the study sample. In addition, one chief officer and town managers/planners were included, alongside officials of the farmer groups.

### **3.5 Sample Size and Sampling Procedure**

#### **3.5.1 Sample Size**

A sample is a small part of the total number that is to be studied. The size of a sample should neither be excessively large nor too small but should be optimum (Kothari & Guarav, 2015). The study used two methods for obtaining the study sample: Fisher's formula and census. The sample size of the urban farmers was calculated by using the Fisher formula (Mugenda and Mugenda, 2012) as follows;

$$n = \frac{Z^2 pq}{d^2}$$

Where;

$n$ =The desired sample size (if the target population is greater than 10,000)

$Z$ =The standard normal deviation, set at 1.96, which corresponds to 95% confidence level

$P$ =The proportion in the target population estimated to have the characteristics being measured

$$q=1-p$$

$d$ =the level of statistical significance set (the degree of accuracy desired, here set at 0.05 corresponding to the 1.96)

If there is no reasonable estimate available of the proportion in the target population assumed to have characteristics of interest, 50 percent is used as recommended by Fisher *et al*

$$q=1-p$$

$d$ =the degree of accuracy desired, here set at 0.05 corresponding to the 1.96

$$n=\frac{(1.96)^2(0.5) \times (0.5)}{(0.05)^2}$$

$$n=\frac{3.8416 \times 0.5 \times 0.5}{0.05^2}$$

$$n=\frac{0.9604}{0.0025}$$

$$n=384$$

But since the study population was less than 1000, the formula below was adopted

$$n_f=n/(1+n/N)$$

$$n_f=384/(1+384/440)$$

$$n_f=384/1.872$$



$$n_f=205$$

To ensure equal representation of respondents in each town based on the targeted population, stratified random sampling involving dividing the population into homogeneous subgroups and then taking a simple random sample of  $f = n/N \times$  sample size in each subgroup was used (Patton, 2002). Where  $f$  is the sample size of the subgroup;  $n$  is the population of the subgroup and  $N$  is the target population. The sample distribution of urban farmers is as shown in Table 3.2.

**Table 3.2: Total Sample Size for the Study Areas**

<b>Town</b>	<b>Study population</b>	<b>Sample size</b>	<b>Percent</b>
Kisumu	145	68	33.2
Kakamega	130	60	29.3
Eldoret	165	77	37.5
<b>Total</b>	<b>440</b>	<b>205</b>	<b>100</b>

### 3.5.2 Sampling Procedure

Simple random sampling was used to select urban farmers who participated in the study. According to Creswell (2015), simple random sampling provides each member of a population equal opportunity of participating in a survey. On the other hand, the census method was used to select the key informant (all the directors of planning, agriculture and livestock, chief officers, and town managers in each town) in the study. Similarly, all the officials of farmer groups were also included as study respondents. According to Orodho (2005), the census method is preferred in cases of small proportions. It involves collection of data from every member of the population to analyze incidences as well as trends in the population. Since the key informants were only 12 while the officials of farmer groups were 24, all of them formed part of the study sample.

### 3.6 Primary Data Collection

The study used the interview method to obtain information from both urban farmers, Key informants, and Focus group interviews (FGD). Questionnaires were used to collect data from

urban farmers who had been practicing UA continuously for five years before inception of the study. A checklist was used as a tool to collect data from Focus groups (FGD), while an interview schedule was used to collect data from Key informants. Additionally, an observation guide was used to collect data, especially during urban farmer interviews in the field. The following section highlights the data collection method, data collection tools, and the data analysis methods used in the study to investigate all three study objectives.

### **3.6.1 Urban Farmer Interview**

The study used a closed-ended structured questionnaire to collect quantitative data from farmers. A questionnaire was deemed suitable in this study since it solicited the views of respondents on their experiences with existing frameworks during their UA practices (Creswell, 2014). Questionnaires are recommended as an appropriate tool for surveys, particularly cross-sectional surveys for gathering constructs of respondents' views with the intent of generalizing from a sample to a population (Fowler, 2008). The questionnaires used had three constructs namely; Yes, No, and Not sure /I do not know. These types of responses enabled the researcher to conduct further log-linear analysis to ascertain the best model for the study.

The questionnaire for urban farmers had five parts (Appendix 1). Section A of the questionnaire was on demographic characteristics of respondents , section B on socio-economic characteristics of urban agriculture , section C on socio-economic and environmental status of urban agriculture, section D on effect of planning legislative framework on urban agriculture ,and section E on contribution of planning strategies, plans and programmes to urban agriculture. Questionnaires enabled the researcher to gather data from a large number of respondents and were easily administered.

The use of questionnaires was advantageous as it enabled the researcher to gather more objective responses from the sampled respondents. These responses were easy to code during analysis since a single number represents the participant's response (Subedi, 2016). This also enables interpretation since the single numbers represent a level of agreement as explained by Taherdoost (2019). The questions were framed in the sequence of the study objectives to enhance clarity and meaning to the respondents. The questionnaires were self-administered by the researcher over a period of three months. An introductory cover letter (appendix 1) was designed to introduce the researcher to the selected respondents.

### **3.6.2 Focus Group Discussions (FGD) Interview**

The researcher similarly designed a focus group discussion (FGD) guide to aid in the collection of opinions of farmer groups on the study object (Appendix 2). Focus group discussions were conducted to assess the general opinion of 24 randomly sampled farmer group officials on the study subject (Appendix 6). The discussions helped verify issues that were not captured through the questionnaire method. Information obtained through this technique was helpful in the final analysis and interpretation of the data. The groups or discussants were primarily composed of officials of urban farmer groups. Three (3) FGD discussions involving eight (8) discussants were held in each of the three towns.

### **3.6.3 Key Informant Interview**

A semi-structured interview schedule was used to collect data from the county Director of Physical Planning, Town planners, county Director of Agriculture/Livestock, and chief officers in the three towns (Appendix 3). An interview is a process of communication or interaction in which the subject or the interviewer gives the needed information, verbally in a face-to-face situation. Interviewing as a research technique involves the researcher asking questions and

hopefully receiving answers from the people being interviewed (Kombo and Tromp, 2006). Creswell (2012) holds that semi-structured and structured interviews are widely used in flexible qualitative designs. The interview schedule was appropriate for the study as it provided in-depth information and a detailed understanding of the issue under research based on lived experiences of the officers. The interview schedule was structured in the sequence of the study objectives.

#### **3.6.4 Secondary Data Collection**

A document analysis guide was used in gathering data related to documented information. In this regard, planning institutional frameworks in the urban areas in Kenya were analyzed, to reveal how they had been influencing urban agriculture among the three towns. These documents included the Physical and Land Use Planning Act, Urban Areas and Cities Act (UACA), Land Policy, and the National Urban Development Policy (NUDP) among others. The researcher analyzed how the planning legislative framework has influenced urban agriculture in the three selected towns of Kisumu, Kakamega, and Eldoret. Similarly, the researcher also analyzed how the planning governance under UACA as mandated by Article 184 (1) (b) of the 2010 Constitution has been managing urban agriculture planning in Eldoret, Kakamega, and Kisumu. In addition, as mandated by Article 185 (2) of the Constitution of Kenya (Kenya, 2010), enacted laws by the county assembly for the effective performance of development functions such as urban agriculture were also analyzed by the researcher. The Land policy 2009 was analyzed, with regard to, how it has ensured that legal and regulatory mechanisms are put in place to regulate urban agriculture. Equally, the extent to which the National Urban Development Policy (NUDP) has been used to provide frameworks for strengthening governance, planning, urban investments, and delivery of social and physical infrastructure among cities under a devolved government was also analyzed. Appendix 5 presents the document analysis guide.

### **3.6.5 Pilot Study**

The study conducted a pilot study involving 20 (or the equivalent of 10% of the sample size) urban farmers from Vihiga Town, who were selected through a simple random sampling technique. These respondents were eventually excluded from the main study. Orodho (2010) declared that a pilot study assists in the feasibility test of the study and enhances instrument validity and reliability.

## **3.7 Validity and Reliability of Research Instruments**

### **3.7.1 Validity of the Research Instruments**

Validity is one of the two threats whose effects must be controlled or minimized throughout a piece of research (Cohen, Manion & Morrison, 2000). Validity is the degree to which results from a study are likely to be true and free from bias if done repeatedly and separately by another study (Rahi, 2017). It is the extent to which results obtained from the analysis of data represent the phenomenon under study.

The study asked questions that required expert knowledge from key informants, and the responses were instrumental in correctly interpreting and triangulating the findings obtained from urban farmer interviews. Several forms of validity were also considered in the study namely; face, content, construct, and criterion validity. Face validity ascertains that the measure appears to be assessing the intended construct under study. Face validity of the research instruments was ensured through pilot testing to help refine the instruments, whereby one town manager was randomly selected from Vihiga town and interviewed. This ensured that the instructions were clear and all possible responses to a question were captured. Before pre-testing, the researcher sought expert and peer opinions on the representativeness and suitability of the items. Suggestions for improvement were made as per necessary amendments to the instrument

hence improving face validity. For construct validity, the researcher took care through the operationalization of the research variables. The researcher ensured that the operationalization through translation reflects the true meaning of the constructs. Kothari (2004) postulates that construct validity is how the researcher translates or transforms a concept of an idea into function and operating reality. The researcher also consulted the supervisors in validating the operationalization of the research variables. Content validity is described as the degree to which an instrument has an appropriate sample of items for the construct being measured (Polit & Beck, 2006). The content validity index (CVI) was used to measure the degree to which the instruments had appropriate items for measuring UA practices.

Criterion validity was ensured using a suitable sampling method that allowed for good measurement of the variables as well as allowing for generalization and transferability. The use of correlation was helpful to ensure criterion validity by establishing the causal relationship between existing institutional planning frameworks and UA. The researcher sought the help of the supervisors to appropriately establish all aspects of validity which sufficiently assisted in measuring the relationship of the study variables.

### **3.7.2 Reliability of Research Instruments**

Reliability is another form of threat whose effects a researcher must strive to minimize. Pre-testing of the tools was undertaken to test whether the questions are clear and easily understood. The pre-testing was also done to improve the content of the questions and to estimate the time required in undertaking the exercise; this helped in identifying the exact number of enumerators required and also in estimating the cost. The pilot testing of the questionnaire was carried out on 20 urban farmers from Vihiga Town, an area with similar socioeconomic characteristics as the study area; thereafter issues arising from the questionnaire were clarified. Internal consistency of

the instrument was determined via the split-half method using Cronbach's Alpha coefficient (Cronbach, 1951). This involved dividing the scale/test in the questionnaire into two halves so that the first half formed the first part of the entire test/scale and the second half the remaining part of the test/scale. This approach was necessary owing to the busy schedules of the farmers and the unlikelihood of finding time with them during second visits, as advised by Kumar (2005). Based on data collected during the pilot study, the reliability of the study questionnaire was tested using Cronbach's Alpha. The target sample for the pilot study was 20 urban farmers from Vihiga Town. The researcher was able to collect data from 19 out of 20 respondents, representing a 95% return rate. Table 3.3 presents the results of the general reliability of the instrument that were used to collect quantitative data from study respondents:

**Table 3.3: Reliability Test Result**

<b>Cronbach's Alpha</b>	<b>Number of Items</b>
0.849	22

Table 3.3 gives evidence that the internal consistency (reliability) of the study questionnaires measured through Cronbach's Alpha is found to be 0.849 which is greater than the threshold of 0.7 (zero point seven). This means that 84.9% of the variance of the score can be considered as true score variance or internal reliability score. Therefore, as the values exceeded the threshold value of 0.7, we can conclude that the questionnaires were of a high level of consistency. If a particular item was deleted from the scale, the Cronbach Alpha would be lowered so that there was no necessity to remove items. Besides this, it is helpful to assess the intra-class correlation. Similarly, Table 3.4 illustrates the reliability analysis results of the study variables:

**Table 3.4: Reliability Analysis of the variables**

<b>Variables</b>	<b>Cronbach's Alpha</b>	<b>Number of Items</b>
Socio-economic & environmental status of UA	0.754	8
Effect of planning legislative framework on UA	0.803	10
Contribution of planning strategies, plans & programmes to UA	0.932	4

As presented in Table 3.4, the reliability analysis reveals an alpha coefficient above the standard of 0.70. For instance, the socio-economic and environmental status of UA was measured by using 8 items and the reported reliability is 0.754; the contribution of planning strategies, plans and programmes to UA was measured using 4 items and the reported reliability is 0.946, and the effect of planning legislative framework on UA was measured using 10 items and the reported reliability is 0.803. Since the Cronbach's Alpha scales obtained were all above the acceptable values of 0.70 (zero point seven), the scales were considered to be consistent. This was capable of ensuring that variables measured the same construct, hence generating internal consistency.

The researcher interviewed one director from Vihiga Town during the pilot study to gauge the effectiveness of the interview schedule in collecting quality data. Dependability of the tool was ensured through examination of raw data, data reduction products and actively taking notes during the interview process as well as recording the whole process. After the interview process, the particular key informant was debriefed on what had been recorded so that those unclear areas could be noted and possibly corrected.

The authenticity and trustworthiness of qualitative data describe the steps taken to ensure the accuracy of study findings and interpretation (Creswell, 2012). The researcher adopted three methods to validate the qualitative data: triangulation, member checking, and auditing. Triangulation involved corroborating evidence from farmer group officials during FGDs as well



as from the town planners, directors of agriculture and livestock, and physical planning during Key informant interviews. Data from the observational field also assisted the researcher in validating descriptions and themes generated in the study. This process aided in the examination of each information source to find evidence to support the themes. This ensured that the study was accurate because the information drew on multiple sources of information, individuals, and processes (Creswell & Miller, 2000). In this way, it encouraged the researcher to develop a report that was both accurate and credible.

The researcher also checked the study findings with the participants to determine if the findings were accurate in a process known as member checking (Lincoln & Guba, 1985). In this regard, the researcher asked one director of agriculture and three farmer group officials from each town to check the accuracy of the findings. This check involved taking the findings back to the randomly selected participants and asking them through interviews about the accuracy of the report. These participants were asked about aspects of the study such as whether the description was complete and realistic if the themes were accurate to include, and if the interpretations were fair and representative. Similarly, the researcher requested a colleague who had previously obtained a graduate degree in sociology to conduct a thorough audit of the study and report back in writing, the strengths and weaknesses of the project: a process referred to as an external audit (Creswell, 2012). The auditor reviewed the work and presented an evaluation of the study during and after its conclusion. The aspects of the study evaluated by the audit include whether the findings were grounded on data; whether inferences were logical; whether themes were appropriate; whether data collection and methodology steps were justified; the degree of research bias; and the strategies used to enhance credibility based on recommendations by Schwandt and Halpern (1988). The concerns raised by the auditor were sufficiently adopted in the report.

### **3.8 Data Analysis**

This study collected and analyzed both qualitative and quantitative data in all the objectives. Qualitative data was collected through the use of key informant interviews(KII) and Focus group discussions(FGD) interview methods, aided by the use of data collection tools such as interview schedules for KII and checklists for FGD. Using content analysis texts from KII and FGD were closely examined then codes were developed which were later subjected to statistical descriptive analysis through the use of SPSS software. Additionally, further log-linear analysis was done to establish the final model amongst the variables for each of the three study objectives.

On the other hand, quantitative data were collected from 205 urban farmers using the interview method through the aid of a questionnaire as a data collection tool. Additional data was further collected from KII and FGD through the use of the interview method aided by the interview schedule and checklist respectively. Descriptive analysis was then used to analyze the quantitative data to yield statistics like percentages and frequencies, while further log-linear analysis was also done to establish the final model among variables for each of the three objectives. In log-linear analysis, the level of significance (whereby  $p < 0.05$ , was considered significant) was used to select the models, identify the critical partial associations, and eventually the final model. The final model from log-linear was then given meaning by explaining the interactions from a planning perspective.

#### **3.8.1 Qualitative Data Analysis**

The study used content analysis that examined the intensity with which certain words had been used (Kombo and Tromp, 2006). Content analysis is a systematic approach to analyzing qualitative data especially qualitative data from focus group discussions and key informant interviews (Bengtsson, 2016). Content analysis was chosen because it enabled close examination

of texts derived from FGDs and interviews consequently allowing the researcher to develop codes from the derived texts which were statistically analyzed.

### **3.8.2 Quantitative Data Analysis**

Descriptive statistics involving measures of central tendency such as frequency, mean, and percentages were employed to assess the current socio-economic and environmental status of UA, legislative frameworks, and contribution to planning strategies, plans, and programmes. Similarly, log-linear analysis was used to obtain the best final linear model that explains the effects and interaction among variables of the three objectives of the study. The advantage of using descriptive statistics was that it aided in presenting descriptions in a manageable form for easy interpretation through contingency tables. According to William (2006), descriptive statistics aids in presenting what the data shows by describing the basic features of the content in a study. Apart from descriptive analysis through the use of contingency tables, the study used log linear analysis to further investigate the interactions among the variables within the three towns. Association between urban agriculture, planning legislative framework, and planning administration in the towns was measured using log linear model. Milewska et al (2018) used results of log-linear analysis to build a model predicting the chances of achieving a clinical pregnancy that contained interactions, and also maintain that log-linear analysis is a practical tool for examining relationships, successfully applied in many fields of science. Berger (2017) outlines a summary of Loglinear Analysis requirements which include the following steps;

Determining whether log-linear modelling is appropriate to the data and research questions. First, if all variables are categorical with a limited number of categories and there is no special dependent variable, consider using basic log-linear analysis. If there is a clear dependent variable, consider logit procedures within log-linear analysis (only effects that involve the DV

are of interest). If the design has both categorical and continuous independent variables, consider using logistic regression, especially if the DV is dichotomous. If the dependent variable has more than two categories, the analysis requires a multinomial response model, and it can be done within the usual log-linear or logistic regression framework. Secondly, the sample size should be at least four times the number of cells, with all expected frequencies greater than 1. Categories may be collapsed or variables dropped to meet these criteria. Larger samples are better, though you must consider effect size along with statistical significance. Third, all observations should be independent. Multiple observations from a single sampling unit are not appropriate for log-linear analysis. Using theory to screen potential models. First, stepwise procedures are used to find the 'best' model, by considering testing ordinal effects and interactions for ordinal variables. (Berger, 2017). If the dependent variable is categorical but some of the predictors are continuous, logistic regression may be the best choice. However, if a cell is structurally empty (e.g., women with prostate surgery), it is important to tell the program to omit that cell from the model. Third, evaluate the fit of the selected model(s) and interpret results and examine tests of significance for each effect in the model, then look at the data and parameter estimates to understand the direction and size of the effects. Lastly, consider the impact of sample size on the power of the statistical tests. Odds ratios and proportions may aid interpretation. Check the residuals from the model to see if there are any outlying cells, (Berger, 2017)

### **3.9 Ethical Considerations**

Ethics in research refer to "moral principles" or codes of behaviour that call for respect of rights of the research participants by the researcher (Gatara, 2010). The main ethical considerations revolved around voluntary participation, informed consent, confidentiality of data, and ethical clearance for conducting the research. The researcher explicitly explained the objectives of the

research and clarified the need for voluntary participation. Ethical clearance was obtained from Maseno University Ethics and Review Committee (MUERC). Before data collection, informed consent was obtained by first requesting the permission of the respondent, in the opening session of the interview, and only preceded where such consent was guaranteed, either verbally or through signed consent (Appendix 11). Responses were not attributed to individuals so confidentiality was maintained. The collected data was stored in soft copy, hard copy, and back-ups to ensure safety.

## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

#### 4.1 Introduction

This section deals with results presentation and discussions based on the objectives of the study. The areas covered include respondents' response rates and demographic characteristics of the surveyed respondents. In addition, the results of content analysis as well as descriptive statistical analysis and log-linear analysis are discussed and presented. The Statistical Package for Social Sciences (SPSS) version 21.0 was used to analyze the data.

#### 4.2 Response Rate

A total of 205 questionnaires were issued to respondents and after several visits alongside assistance from officials of farmer groups, the researcher was able to collect back all the questionnaires. This was therefore 100% return rate. Creswell (2014) asserts that a feedback rate of more than 50% is adequate for analysis. Table 4.1 presents the questionnaire response rate.

**Table 4.1: Questionnaire Response Rate**

<b>Questionnaire</b>	<b>Number</b>	<b>Percentage %</b>
Delivered	205	100
Returned	205	100

#### 4.3 Demographic Information of Respondents

The first section of the study questionnaire enquired about biographical information of the study respondents. Demographic information was categorized as gender, age, education level, and household size of the study respondents. The data was disaggregated and analyzed per town to highlight any unique similarities and differences. This information is presented in Table 4.2.

**Table 4.2: Demographic Characteristics of Respondents**

Characteristic	Category	Town		
		Kisumu	Kakamega	Eldoret
Gender	Male	41.2	68.3	55.8
	Female	58.8	31.7	44.2
<b>Total</b>		<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Age	Below 30	25.0	0.0	10.4
	31 – 40	64.7	8.3	31.2
	41 – 50	10.3	26.7	11.7
	51 - 60	0.0	11.7	19.5
	Above 61	0.0	53.3	27.3
<b>Total</b>		<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Education Level	Primary	0.0	8.3	0.0
	Secondary	45.6	68.3	6.5
	College/University	54.4	23.3	93.5
<b>Total</b>		<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Household size	2 – 5	39.7	25.0	58.4
	6 – 10	60.3	63.3	41.6
	Above 10	0.0	11.7	0.0
<b>Total</b>		<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Level of adoption	Very high	2.9	65.0	62.3
	High	82.4	21.7	32.5
	Average	10.3	11.7	1.3
	Low	4.4	1.7	3.9
<b>Total</b>		<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

The results in Table 4.2 above indicate that males dominated Kakamega and Eldoret, while females were the majority in Kisumu town. This finding concurs with Dima, Ogunmokun & Nantanga (2002) who revealed that male and female-headed households were 78% and 2% respectively. This finding shows that more males participated in this study than females since they dominated in two towns.

Table 4.2 indicates that the age category of 31-40 years was most common in Kisumu and Eldoret towns, as opposed to Kakamega where the age category above 61 years dominated. This contrasts with the finding by Dima, Ogunmokun & Nantanga (2002) that the majority of the respondents are young people falling in the age range of 21-40 (66.3%). The distribution of the sampled respondents by age in the study towns signifies that majority of people undertaking urban agriculture was mostly dominated by youths, with probable responsibility of providing food to their households. With regards to education level, Table 4.2 illustrates that respondents who had attained primary and secondary level education were mostly in Kakamega, while those who had college and university level education were most common in Eldoret. This finding implies that, except for Kakamega town where a small proportion of respondents had primary level education, majority of urban farmers in the three towns had a good level of education ranging from secondary to university. This implies that most respondents had some level of education, which is an indicator of the level of literacy, hence may have enhanced understanding of respondents on issues under study.

Results from Table 4.2 show that majority of respondents in Kisumu and Kakamega were mostly having a household size of 6-10 members, while a household size of 2-5 members was most common in Eldoret. It appears that majority of respondents in Kisumu and Kakamega had larger household sizes than in Eldoret, a pointer to a possible high demand for food in these two towns than the latter, thereby necessitating more urban agriculture practice. In terms of adoption of urban agriculture, Table 4.2 shows that adoption was high in Kisumu (82.4%) and Eldoret (62.3%), but very high in Kakamega (65.05%).



#### 4.4 Socio-Economic Characteristics of Respondents

The study also enquired about the socio-economic characteristics of the urban farmers, since these characteristics often relate to the status of urban agriculture. These characteristics included; income level, types of livestock kept, commodity produced, main crops grown, source of water, and main constraints in practicing urban agriculture. The following is the presentation of the results.

**Table 4.3: Plot size and Main Crop grown**

Name of town			Main crop grown		Total
			Vegetables (tomatoes, kales, local vegetables, onions)	Cereals (maize, sorghum)	
Kisumu	Plot size	Below 100m <sup>2</sup>	100.0%	0.0%	100.0%
		501-1000m <sup>2</sup>	64.3%	35.7%	100.0%
Kakamega	Plot size	Below 100m <sup>2</sup>	0.0%	100.0%	100.0%
		101-500m <sup>2</sup>	9.7%	90.3%	100.0%
		501-1000m <sup>2</sup>	0.0%	100.0%	100.0%
		1001-3000m <sup>2</sup>	0.0%	100.0%	100.0%
		Above 3000m <sup>2</sup>	0.0%	100.0%	100.0%
Eldoret	Plot size	Below 100m <sup>2</sup>	50.0%	50.0%	100.0%
		101-500m <sup>2</sup>	100.0%	0.0%	100.0%
		501-1000m <sup>2</sup>	26.7%	73.3%	100.0%
		Above 3000m <sup>2</sup>	100.0%	0.0%	100.0%

Results from Table 4.3 show that most respondents with plot sizes below 100m<sup>2</sup> and 101-500m<sup>2</sup> were growing vegetables as the main crop in Kisumu and Eldoret towns. However, majority of respondents were growing cereals, especially maize, in all plot sizes in Kakamega town. Half of respondents in Eldoret, with plot sizes below 100m<sup>2</sup>, had both vegetables and cereals in equal proportions, with the plot sizes 101-500m<sup>2</sup> and above 3000m<sup>2</sup> mostly having vegetables while respondents with plots 501-1000m<sup>2</sup> were mostly growing cereals. Overall, irrespective of plot size, the main crop grown was vegetables in Kisumu town, cereals especially maize in Kakamega town, and vegetables in Eldoret town. Dima, Ogunmokun & Nantanga (2002) concurs that in some cities in Africa like Harare, urban agriculture practice has advanced to the

production of maize as their main staple food. The size of a plot owned by a farmer may promote or restrict urban agriculture. Land space is a critical limiting factor in agricultural production, especially in urban areas where there are competing land uses, besides agriculture. From a planning perspective, the growing of short or tall crops in a town set up is regulated by Physical Planning and Land Use Regulation No. 13 and by-laws. Growing tall crops is prohibited by the regulations since it can harbour thieves and be a source of breeding mosquitoes while growing short crops less than 1 metre is allowed. It seems urban farmers in Kisumu and Eldoret were more compliant with the regulations than in Kakamega where farmers were growing tall crops, irrespective of plot sizes. This could be a pointer to strict enforcement of the law in Kisumu and Eldoret than in Kakamega town or perhaps, due to the culture and sentimental value they attached to farming.

**Table 4.4: Plot Size and Type of livestock Kept**

Name of town			Type of livestock			Total
			Local	Exotic	Both	
Kisumu	Plot size	Below 100m sq.	92.6%	7.4%		100.0%
		501-1000m sq.	100.0%	0.0%		100.0%
Kakamega	Plot size	Below 100m sq.	0.0%	100.0%	0.0%	100.0%
		101-500m sq.	100.0%	0.0%	0.0%	100.0%
		501-1000m sq.	50.0%	50.0%	0.0%	100.0%
		1001-3000m sq.	0.0%	100.0%	0.0%	100.0%
		Above 3000m sq.	0.0%	0.0%	100.0%	100.0%
Eldoret	Plot size	Below 100m sq.	42.3%	57.7%		100.0%
		101-500m sq.	100.0%	0.0%		100.0%
		501-1000m sq.	0.0%	100.0%		100.0%
		Above 3000m sq.	0.0%	100.0%		100.0%

Results from Table 4.4 show that majority of respondents with plot sizes below 100m<sup>2</sup> and 501-1000m<sup>2</sup> were mostly keeping indigenous livestock in Kisumu town. Respondents in Kakamega with plot sizes below 100 m sq. and 1001-3000m sq were mostly keeping exotic livestock, those with 101-500m sq. were keeping indigenous livestock, while those with plot sizes 1001-3000m

sq. and above 3000m sq. were mostly keeping exotic or both types of livestock respectively. In Eldoret town, apart from respondents with plot sizes 101-500m sq. who were keeping indigenous livestock, majority with other categories of plot sizes were mostly keeping exotic livestock. Overall, indigenous livestock was mostly kept in Kisumu in plot sizes of below 100m<sup>2</sup> -500m<sup>2</sup> while exotic livestock was kept in all categories of plot sizes in Kakamega and Eldoret.

**Table 4.5: Main source of Income and Commodity produced**

Name of town			Commodity produced				Total
			Milk	Eggs	Kales	Local veges	
Kisumu	Main source of income	Farming	6.7%	40.0%	53.3%		100.0%
		Formal employment	0.0%	100.0%	0.0%		100.0%
Kakamega	Main source of income	Farming	33.3%	6.7%	44.4%	15.6%	100.0%
		small scale business	0.0%	41.7%	0.0%	58.3%	100.0%
		Rental houses	100.0%	0.0%	0.0%	0.0%	100.0%
Eldoret	Main source of income	Farming	41.9%	0.0%	22.6%	35.5%	100.0%
		small scale business	0.0%	100.0%	0.0%	0.0%	100.0%
		Formal employment	37.5%	37.5%	25.0%	0.0%	100.0%

Results from Table 4.5 show that, in Kisumu, most respondents whose main source of income was farming were producing kales while those in formal employment were egg producers. In Kakamega, those doing farming were kale producers, small businesses were producing local vegetables, while rental house owners were mostly milk producers. In Eldoret town, those involved in farming as the main source of income were milk producers, and those with small-scale businesses produced eggs while most respondents with formal employment as the main source of income were milk and egg producers in equal proportions. It is important to note that urban farmers were producing different commodities based on their main source of income, with the majority whose main source of income is farming only able to invest in kales production,

while those with the main source of income as a rental, formal employment, and small scale business investing in eggs, milk and local vegetables, which perhaps required more investment capital. Most respondents involved in farming as the main source of income were kales and milk producers in all three towns. Those in formal employment were mostly eggs and milk producers in Kisumu and Eldoret towns, while those in small businesses mostly produced kales and eggs in Kakamega and Eldoret. Those whose main income source was rental houses were the only urban farmers producing milk in kakamega town. Overall, irrespective of the main source of income, respondents were mainly producing kales and eggs in Kisumu; kales, local vegetables, and milk in Kakamega; and eggs, local vegetables, and milk in Eldoret town.

**Table 4.6: Income Level and Source of water**

Name of town			Source of water				Total
			Piped water	Stream/River/Lake water	Rain/water vendors	Sewerage water	
Kisumu	Income level	Below Kshs. 30,000	43.6%	0.0%	15.4%	41.0%	100.0%
		Kshs. 31000-40000	75.0%	25.0%	0.0%	0.0%	100.0%
		Kshs. 41000-50000	100.0%	0.0%	0.0%	0.0%	100.0%
Kakamega	Income level	Below Kshs. 30,000	26.7%	22.2%	51.1%	0.0%	100.0%
		Kshs. 31000-40000	0.0%	0.0%	62.5%	37.5%	100.0%
		Kshs. 41000-50000	100.0%	0.0%	0.0%	0.0%	100.0%
Eldoret	Income level	Below Kshs. 30,000	29.7%	0.0%	70.3%		100.0%
		Kshs. 31000-40000	100.0%	0.0%	0.0%	??	100.0%
		Kshs. 41000-50000	0.0%	100.0%	0.0%	??	100.0%

Results from Table 4.6 show that respondent whose income levels were below Kshs. 30,000, the majority were using sewerage water, while those of income category Kshs. 31000-40000 and Kshs. 41000-50000 were mostly using piped water in Kisumu town. However, in Kakamega town, except for the income category Kshs. 41000-50000 which was using piped water, the rest of the respondents were using rain or water from water vendors for their farming activities. In Eldoret town, respondents with income levels below Kshs. 30,000 were mostly using rain or

water from water vendors for farming, those in the income category between Kshs. 31000-40000 used piped water, while the majority were in the income category of Kshs. 41000-50000 mainly used water from streams, rivers, or lakes to carry out their farming activities. Overall, irrespective of the income level of respondents, sewerage and piped water were the main sources of water for UA activities in Kisumu town; piped water and rain or water from water vendors in Kakamega; and rain or water from water vendors, piped water, and stream, river, or lake water were the most common sources of water for farming in Eldoret town. The use of sewerage water in Kisumu town is a serious environmental and health concern, although not uncommon in most rapidly growing cities.

**Table 4.7: Commodity produced and the Main constraint in UA**

Name of town			Main constraint in UA				Total	
			Non-supportive policies/legislations	Land shortage	Lack of credit	Inadequate knowledge/skills		Water shortage
Kisumu	Commodity produced	Milk	0.0%	0.0%			100.0%	100.0%
		Eggs	37.5%	37.5%			25.0%	100.0%
		Kales	21.9%	78.1%			0.0%	100.0%
Kakamega	Commodity produced	Milk	0.0%	50.0%	16.7%	0.0%	33.3%	100.0%
		Eggs	37.5%	0.0%	0.0%	62.5%	0.0%	100.0%
		Kales	25.0%	0.0%	0.0%	35.0%	40.0%	100.0%
		Local veges	50.0%	0.0%	0.0%	50.0%	0.0%	100.0%
Eldoret	Commodity produced	Milk		0.0%	46.4%	0.0%	53.6%	100.0%
		Eggs		0.0%	71.4%	0.0%	28.6%	100.0%
		Kales		0.0%	0.0%	58.8%	41.2%	100.0%
		Local veges		100.0%	0.0%	0.0%	0.0%	100.0%

Results from Table 4.7 show that among respondents whose main commodity produced was milk, the majority experienced water shortage as the main constraint, those producing eggs had non-supportive policies/legislations and land shortage in equal proportions, while those producing kales were mostly affected by land shortage in Kisumu town. However, in Kakamega,

milk producers experienced mostly land shortages, egg producers had inadequate knowledge/skills, and kale producers were affected by water shortages while those producing local vegetables mostly experienced inadequate knowledge/skills and non-supportive policies/legislations as the main constraints in their UA activities. In Eldoret town, respondents who were producing milk experienced water shortage as the main constraint, those producing eggs were mostly affected by land shortage, those producing kales by inadequate knowledge and skill, and lastly, local vegetable producers were most affected by land shortage. Notwithstanding the kind of commodity produced, water shortage, non-supportive policies/legislations, and land shortage were the main constraints affecting UA in Kisumu town, while in Kakamega, land shortage, water shortage, inadequate knowledge/skills, and non-supportive policies/legislations were the major constraints in UA. However, the main constraints in Eldoret town were water shortage, inadequate knowledge and skills, and land shortage. This finding on constraints ought to be considered in the future by planners and policymakers, as it can provide an important entry point for intervention in the promotion or facilitation of urban agriculture in the study towns

**Table 4.8 Capacity building workshop on agriculture or planning issue attended and Main crop grown**

Name of town			Main crop grown		Total
			Vegetables(tomatoes, kales, local vegetables, onions)	Cereals(maize, sorghum)	
Kisumu	capacity building workshop	Yes	91.2%	8.8%	100.0%
	on agriculture or planning issue attended	No	100.0%	0.0%	100.0%
Kakamega	capacity building workshop	Yes	4.3%	95.7%	100.0%
	on agriculture or planning issue attended	No	5.4%	94.6%	100.0%
Eldoret	capacity building workshop	Yes	69.7%	30.3%	100.0%
	on agriculture or planning issue attended	No	71.4%	28.6%	100.0%

Table 4.8 shows that majority of those who had received capacity building either in agriculture or planning were vegetable growers in Kisumu and Eldoret towns while in Kakamega, the

majority who had been capacity built were cereal growers. Similarly, the majority who had not been capacity built were vegetable growers in Kisumu and Eldoret towns, while in Kakamega, the majority who had not been capacity built were maize growers. In general, the majority of respondents who had been capacity built were vegetable growers in Kisumu and Eldoret while in Kakamega, they were cereal growers.

#### 4.5 The Socio-Economic and Environmental Status of Urban Agriculture

The first objective of the study sought to establish the socio-economic and environmental status of urban agriculture in the three study towns, which was analyzed in terms of social, economic, and environmental dimensions of urban agriculture. The factors which were under investigation included: the main objective of farming, provision of continuous supply of fresh and healthy produce, supplementing household food supply, poultry keeping yielding high income, generation of employment and reuse of greywater in farm reduces discharge to the environment.

##### 4.5.1 Social Dimension

The variables which were investigated under the social contribution /dimension of urban agriculture were the main objective of the study and urban agriculture as a provider of fresh and healthy produce to urban farmers.

**Table 4.9: Household size and Main objective of participating in UA**

Name of town			Main objective- UA improves household food nutrition		Total
			Yes	No	
Kisumu	Household size	2-5	100.0%		100.0%
		6-10	100.0%		100.0%
Kakamega	Household size	2-5	66.7%	33.3%	100.0%
		6-10	100.0%	0.0%	100.0%
		Above 10	100.0%	0.0%	100.0%
Eldoret	Household size	2-5	75.6%	24.4%	100.0%
		6-10	65.6%	34.4%	100.0%

Results from Table 4.9 show that majority of respondents of varying household sizes 2-5, 6-10, and above 10 members, agreed that their main objective of engaging in UA is to improve household food nutrition in Kisumu, Kakamega, and Eldoret towns. Thus, food provision was a driver of UA practice that seems to be the motivating factor among the sampled farmers. This finding concurs with Abera, Tadesse & Belayneh, (2017) who assert that vegetables provide important minerals and vitamins in human nutrition and add variety as well as interest to meals.

Interviews with the County Directors of Agriculture in the three study towns revealed that UA activities improve household food nutrition. The director explained that UA plays a special role in towns, since it makes towns liveable, besides providing food, income, and self-employment. A statement from one County Director of Agriculture, with regards to UA making towns liveable and reducing the cost of living was;

*"Today, I was giving a story to my sister about UA making towns liveable, by reducing the cost of living. If you have Kshs. 100 to budget for the day, you don't have unga and mboga, would you go for oranges? No, you wouldn't, you would go for sukuma wiki and unga straight away. But if you have a small garden at the back of your house, you can plant vegetables then you can reduce your cost of living. UA can therefore provide foods for the family and surplus for sale" (County Director of Agriculture-1).*

This statement attributed to the County Director of Agriculture-1 implies that UA has benefits to families, in terms of food and income provision. Also, UA helps the farmers to save money that could have been used to buy food, thus assisting farmers in meeting their social livelihood needs. These findings seem to concur with earlier studies especially those done in Sub-Saharan Africa (SSA). For instance, Salau and Attah (2012) assessed the contribution of UA to the socio-economic development of urban farmers in Nigeria and concluded that people adopt urban agriculture due to its benefits such as provision of food, income, and employment among others. The findings also concur with Gelan and Seifu (2016) who observed that various types of urban



farming such as; poultry, fattening, dairy, fruit and vegetable, nursery, and ornamental crops play multiple roles to the farmers including income generation, employment, and household food supplement in Ethiopia. Thus, it can be deduced that UA plays a significant role in supplementing household nutrition as well as acting as a source of income.

The study further analyzed how plot ownership relates to UA practice aimed at providing fresh and healthy food produce to families in the three towns. Table 4.10 presents the cross- of plot ownership and UA provision of fresh and healthy produce.

**Table 4.10: Plot Ownership and UA Provides Fresh & Healthy Produce**

Name of town			UA provides fresh & healthy produce		Total
			Yes	No	
Kisumu	Plot ownership	Yes	100.0%	0.0%	100.0%
		No	81.8%	18.2%	100.0%
Kakamega	Plot ownership	Yes	9.1%	90.9%	100.0%
		No	0.0%	100.0%	100.0%
Eldoret	Plot ownership	Yes	69.9%	30.1%	100.0%

Results from Table 4.9 show that majority of respondents who owned or did not own plots agreed that UA provides fresh and healthy produce in Kisumu and Eldoret towns. However, in Kakamega town, the majority who owned or did not own plots disagreed. This finding shows that UA plays a critical role in the provision of fresh and healthy produce to urban farmer households.

Further discussions during FGD revealed that UA supplements household food supply by providing vegetables, milk, and eggs. This was captured in a statement by one of the FGD members;

*I grow mostly indigenous vegetables and kale in the plot where I stay. Additionally, I also keep some indigenous chicken for egg and meat production. Sometimes when I do not have enough cash to buy food, I harvest some vegetables and pick some eggs to prepare a meal for my family. In this way, UA supplements my food needs as a source of vegetables and eggs (FGD member-1).*

The statement by FGD member-1 attempts to illustrate the role played by UA in supplementing household food needs. UA is therefore an important source of vitamins and proteins that helps to improve the nutrition of household members. The role played by UA in providing better nutrition also formed a major finding in a study done in Eldoret (Kenya) by Korir et al (2015).

#### 4.5.2 Economic Dimension

The researcher additionally analyzed how urban agriculture relates to provision of income, and self-employment generation. Income provision is one of the economic benefits that urban farmers accrue from practicing urban agriculture. For instance, poultry keeping enables farmers to earn income from sales of poultry products including eggs and chicken. This contribution of UA to households was illustrated during an interview with urban farmers. Table 4.11 presents the distribution of types of livestock and poultry keeping for income generation among the sampled urban farmers.

**Table 4.11: Type of Livestock and Poultry Keeping results in High Income**

Name of town			Poultry keeping results in high income		Total
			Yes	No	
Kisumu	Type of livestock	Indigenous	93.9%	6.1%	100.0%
		Exotic	100.0%	0.0%	100.0%
Kakamega	Type of livestock	Indigenous	75.0%	25.0%	100.0%
		Exotic	100.0%	0.0%	100.0%
		Both	0.0%	100.0%	100.0%
Eldoret	Type of livestock	Indigenous	100.0%	0.0%	100.0%
		Exotic	36.7%	63.3%	100.0%

Results from Table 4.10 show that majority of respondents who were keeping indigenous livestock affirmed that poultry keeping resulted in high income in Kisumu, Kakamega, and Eldoret towns, while the majority of those keeping exotic livestock similarly affirmed that poultry keeping resulted in high income in Kisumu, and Kakamega but not in Eldoret town.

Overall, among those keeping indigenous livestock, the majority affirmed that poultry keeping resulted in high income in Kisumu, Kakamega, and Eldoret towns.

Further interview with one County Director of Livestock in one of the three study towns revealed that most urban farmers keep either exotic, indigenous, or both types of livestock, as a source of food, income, and employment. The Director narrated that;

*In this town, most urban farmers keep either exotic, indigenous, or both types of livestock as a source of food, income, and employment. Dairy and poultry keeping are especially popular with farmers due to the high returns accrued from these enterprises. Most farmers keep dairy cows and poultry in their backyards (County Director of Livestock -2).*

This statement attributed to the County Director of Livestock-2 suggests that due to inadequate spaces for practicing UA, most livestock farmers in the town use their backyards. This seems to concur with earlier studies such as Kuusaana and Eledi (2015) which highlighted that the absence of urban green belts reduces farming to flood plains and along public drains where wastewater is used for irrigation in Ghana. This finding shows that urban agriculture is viewed more or less as a leftover category, which acts like a filler or complimentary user or Locally Unwanted Land Use (LULU) rather than a main land user category in most zoning plans. Similarly, Martinez and colleagues (2010) identified regulatory uncertainties as significant barriers to UA, almost falling short of decrying the absence of suitable institutional frameworks to guide UA in three study towns.

The researcher additionally analyzed whether or not UA generates self-employment based on commodities produced by the farmers. The commodities or farm produce assessed included milk, eggs, kale, and local vegetables. Table 4.12 presents the distribution of commodities or produce and generation of self-employment among the three towns.

**Table 4.12: Commodity produced and Urban Agriculture generates Self-Employment**

Name of town			UA generates self-employment		Total
			Yes	No	
Kisumu	Commodity produced	Milk	100.0%	0.0%	100.0%
		Eggs	90.6%	9.4%	100.0%
		Kales	87.5%	12.5%	100.0%
Kakamega	Commodity produced	Milk	0.0%	100.0%	100.0%
		Eggs	100.0%	0.0%	100.0%
		Kales	100.0%	0.0%	100.0%
		Local veges	100.0%	0.0%	100.0%
Eldoret	Commodity produced	Milk	100.0%	0.0%	100.0%
		Eggs	71.4%	28.6%	100.0%
		Kales	0.0%	100.0%	100.0%
		Local veges	100.0%	0.0%	100.0%

Results from Table 4.12 show that majority of respondents who were producing eggs maintained that UA generates self-employment in all towns, while milk producers asserted that UA generates self-employment in Kisumu and Eldoret. However, the majority of respondents producing kales maintained that UA generates self-employment in Kisumu and Kakamega but not in Eldoret. Similarly, those who mostly produced local vegetables also maintained UA generates self-employment in Kakamega and Eldoret towns

Overall, the majority of egg producers maintained that UA generates self-employment in all towns, milk producers agreed to the same in Kisumu and Eldoret, Majority of kale producers maintained that UA generates self-employment in Kisumu and Kakamega, and likewise local vegetable producers in Kakamega and Eldoret towns. Gelan and Seifu (2016) concur that urban agriculture leads to income generation, employment, and household food supplement. Similarly, Abera, Tadesse, and Belayneh (2017) also concurred UA generates household income, employment opportunities, and contributes to food supply to households. Thus It is the finding of this study UA provides income and self-employment.

### 4.5.3 Environmental Dimension

Additionally, this study also enquired about the reuse of greywater on farms, and whether it leads to reduction of discharge to the environment or not. It is widely documented that urban agriculture has a beneficial environmental dimension, as it can contribute to a clean environment through the recycling of waste and reuse of wastewater. This is besides benefits attributed to tree crops for those undertaking fruit farming. The researcher, therefore, assessed the sources of water used by the sampled farmers and their understanding with regards to reuse of greywater on farms and reduction of discharges to the environment. Table 4.13 presents the distribution by source of water and reuse of greywater in farms for reduced discharges to the environment.

**Table 4.13: Main source of water for UA and Reuse of greywater in farm reduces discharge to environment**

Name of town			Reuse of greywater on farm reduces discharge to environment		Total
			Yes	No	
Kisumu	Main source of water	Piped water	100.0%		100.0%
		Stream/River/Lake water	100.0%		100.0%
		Rain/water vendors	100.0%		100.0%
		Sewerage water	100.0%		100.0%
Kakamega	Main source of water	Piped water	100.0%	0.0%	100.0%
		Stream/River/Lake water	0.0%	100.0%	100.0%
		Rain/water vendors	68.8%	31.3%	100.0%
		Sewerage water	0.0%	100.0%	100.0%
Eldoret	Main source of water	Piped water	51.5%	48.5%	100.0%
		Stream/River/Lake water	100.0%	0.0%	100.0%
		Rain/water vendors	57.9%	42.1%	100.0%

Table 4.13 shows that most respondents who affirmed that reuse of grey water on farm reduces discharges to the environment were mostly using piped water, rainwater/water vendors, as the main source of water for farming in Kisumu, Kakamega, and Eldoret towns, while in Kisumu, Kakamega and Eldoret towns, they used rain or water from water vendors for farming. However, in Kisumu town, respondents who used sewerage water agreed that reuse of grey water on farm reduces discharges to the environment, while their counterparts in Kakamega disagreed. Overall,

majority of respondents, irrespective of the main source of water used for farming, agreed that reuse of grey water on farm reduces discharges to the environment in Kisumu, Kakamega, and Eldoret, with exception of those who used stream, river, or lake water, and sewerage in Kakamega town who disagreed.

Further discussions with members of FGD, on how reuse of grey water reduces discharges and hence improves the environment, revealed that UA can be useful in conserving the environment if it is practiced under proper regulation. Additionally, UA has many environmental benefits which included; cleaning of the environment during waste collection, production of manure for farming, provision of clean and safe energy (biogas), and mitigation of climate change effects in urban environments. It, therefore, implies that by one autonomous system (farmers) opting to reuse water in conducting UA, the whole community (entire system) stands to benefit from the clean environment.

Based on the foregoing discussions, the current status of UA in the three study towns is summarized as follows; The demographic characteristics of the respondents show that males dominated the study mostly in Kakamega and Eldoret, while females were the majority in Kisumu town. The age category of 31-40 years was most common in Kisumu and Eldoret towns, as opposed to Kakamega where the age category above 61 years dominated. Except for Kakamega town where a small proportion of respondents had primary level education, the majority of urban farmers in the three towns had a good level of education ranging from secondary to university. Majority of respondents in Kisumu and Kakamega were mostly having household size of 6-10 members, while household size of 2-5 members was most common in Eldoret.

In terms of socio-economic characteristics of respondents, indigenous livestock was mostly kept by most respondents in Kisumu in plot sizes of below 100m<sup>2</sup> -500m<sup>2</sup> while exotic livestock was kept in all categories of plot sizes in Kakamega and Eldoret. Most urban farmers in Kisumu and Eldoret were growing short crops while in Kakamega town, farmers were mostly growing tall crops, irrespective of plot sizes. Indigenous livestock was mostly kept in Kisumu in plot sizes of below 100m<sup>2</sup> -500m<sup>2</sup> while exotic livestock was kept in all categories of plot sizes in Kakamega and Eldoret.

Again, irrespective of the type of main source of income, respondents were mainly producing kales and eggs in Kisumu, kales, local vegetables and milk in Kakamega, and eggs, local vegetables, and milk in Eldoret town. Irrespective of the income level of respondents, sewerage and piped water were the main sources of water for UA activities in Kisumu town, piped water and rain or water from water vendors in Kakamega, while rain or water from water vendors, piped water, and stream, river or lake water were the most common sources of water for farming in Eldoret town. The use of sewerage water by urban farmers in Kisumu city implies that farmers are using polluted water in their farming activities which may expose consumers as well as the farmers themselves to diseases and other health problems. It further points to the need to regulate urban agriculture to create a trade-off between maximizing its benefits and reducing its risks.

Notwithstanding the kind of commodity produced, water shortage, non-supportive policies/legislations, and land shortage were the main constraints affecting UA in Kisumu town, while in Kakamega, land shortage, water shortage, inadequate knowledge/skills, and non-supportive policies/legislations were the major constraints in UA. However, the main constraints in Eldoret town were water shortage, inadequate knowledge and skills, and land shortage.

Furthermore, on the basis of cross-tabulations of variables for the socio-economic and environmental status of UA, findings indicate that the majority of respondents of varying household sizes (2–5, 6–10, and above 10 members) agreed that their main objective of engaging in UA was to improve household food nutrition in Kisumu, Kakamega, and Eldoret towns. It was observed that the majority of respondents, irrespective of ownership of plot, affirmed that UA provides fresh and healthy produce in Kisumu and Eldoret towns, while in Kakamega town, the majority did not affirm.

Findings show that the majority of respondents who were keeping indigenous livestock affirmed that poultry keeping resulted in high income in Kisumu, Kakamega, and Eldoret towns, while majority of those keeping exotic livestock similarly affirmed that poultry keeping resulted in high income, except in Eldoret where respondents disagreed. Thus, irrespective of the type of livestock kept, majority agreed that poultry keeping resulted in high income in Kisumu and Kakamega, while, those keeping indigenous livestock or exotic either agreed or disagreed in Eldoret. Majority of respondents who agreed that UA generates self-employment were mostly milk and eggs producers in Kisumu and Eldoret towns, and vegetable (kales) producers in Kisumu and Kakamega towns. Respondents affirmed that reuse of grey water on farms reduce discharges to the environment in Kisumu, Kakamega, and Eldoret, with exception of those who used stream, river, or lake water, and sewerage in Kakamega town who disagreed.

#### **4.5.4 Loglinear Analysis for Variables of Current Status of Urban Agriculture**

The log-linear analysis is a practical tool for examining relationships, successfully applied in many fields of science (Milewska *et al*, 2018). The study sought to further analyze the relationship between a few selected variables of UA which include; improving food nutrition,



poultry keeping yield high income, and reuse of grey water reduces discharge to the environment  
(Table 4.14)

**Table 4.14: Description of Categorical data for Loglinear Model**

Name of Constructs	Symbols of Categorical variable
Food nutrition	FN
Poultry yield high income	PI
Greywater reuse reduces discharge to environment	GW

#### 4.5.4.1 Model Selection

Model selection was done by subjecting the three selected variables to a log-linear analysis in SPSS Version 21. Table 4.15 displays the k-way and higher order effects.

**Table 4.15: K-way and Higher-order effects**

	K	Df	Likelihood Ratio Chi-Square	Ratio Sig.	Pearson Chi-Square	Sig.	Number of Iterations
K-way and Higher Order Effects	1	26	503.391	.000	1012.435	.000	0
	2	20	19.169	.511	16.472	.687	2
	3	8	.000	1.000	.000	1.000	3
K-way Effects	1	6	484.221	.000	995.963	.000	0
	2	12	19.169	.085	16.472	.171	0
	3	8	.000	1.000	.000	1.000	0

Table 4.15 shows there are two tables, the top and lower table. Since K way terms and higher in the top table are not included in the model, they can be tested for inclusion in the model, in the lower table, by subtracting likelihood ratio chi-squares of the 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> K way terms and higher effects. The top table shows the significance of all terms of a given order and higher. For example, 19.169 tests the significance of all terms of second order and higher, while 0.000 tests significance of third term or 3-way interactions in the last K-way terms and high order since there are only three variables for analysis.

From the top table, 503.391 is the likelihood ratio chi-square of the mean only excluding parameters while 0.000 is the likelihood ratio chi-square for the complete independence model.

The difference between 503.391 and 19.169 is 484.222 which weighs the improvement of the model after including main effects. Since the improvement is related to a p-value = 0.687, which was not significant, the hypothesis that main effects do not exist is rejected.

The inclusion of 2-way effects also changes the likelihood ratio chi-square by 484.221 with a p-value of .000, implying that it is significant. Since the p-value < .05, the hypothesis that the first-order effects do not exist is rejected.

Similarly, the likelihood ratio chi-square is also not improved by 0.000 when third-order effects are included which is not significant (p=1.000), since the p-value > .001. The hypothesis that the third-order effects are zero is also accepted since p > .05 meaning that third-order effects do not exist.

#### 4.5.4.2 Partial associations

Table 4.16 shows the partial association among the variables

**Table 4.16: Partial Associations**

<b>Effect</b>	<b>Df</b>	<b>Partial Chi-Square</b>	<b>Sig.</b>	<b>Number of Iterations</b>
FN*PI	4	6.745	.150	2
FN*GW	4	12.493	.014	2
PI*GW	4	3.815	.432	2
FN	2	182.134	.000	2
PI	2	135.302	.000	2
GW	2	166.786	.000	2

Results from Table 4.16 shows the relationship of the variables(factors) in terms of their partial association between the main terms and interaction effects. The interaction effects with p-values < .05 are significant. From the values displayed in Table 4.16, all three main terms FN, PI, GW and the 2-way interactions FN\*GW were significant at p-value =0.000 and 0.014 respectively. This implies that the possibility of them being included in the final model is very high. However,

the other 2-way interactions PI\* GW and FN\* PI were not significant and hence were to be left out of the resultant model. Results also show that only 2 k factor has a p-value of 0.014 which has a p-value<0.05, which explain the 2-way interaction between FN\*GW, while the other two factors (1 and 3), representing FN\*PI and PI\*GW respectively, have p-values > .001, hence the second term (K-factor) is of high significant while first and third factor are not significant. The inclusion of the second-order interaction into the resultant model is therefore necessary.

From the partial associations of the three variables FN, PI, and GW, we conclude that there is a significant effect in the inclusion of the main effects in the model, but only the two-factor interaction of FN\*GW shows a significant effect and therefore should be included alongside the main effects. There is no evidence to support the inclusion of the three-factor interaction. After analysis of partial association, the next step of backward elimination is adopted to obtain the convergence information. Table 4.17 shows the convergence information.

**Table 4.17: Convergence Information**

Generating Class	UA_Nutrition*UA_greywater, UA_Salespoultry
Number of Iterations	0
Max. Difference between Observed and Fitted Marginals	.000
Convergence Criterion	.250

a. Statistics for the final model after Backward Elimination.

Results from the convergence information table 4.17 show that the final model after backward elimination is FN\*GW and PI. Food nutrition (FN) and greywater reuse reduce discharge to Environment (GW) displayed a 2-way interaction effect, which implies that most urban farmers were recycling greywater from their kitchens to grow crops in their gardens. Majority of urban farmers (100%) in Kisumu and Kakamega towns were reusing greywater to grow mostly vegetables and cereals, while some 79.5% were also doing the same in Eldoret town. The finding implies that water access and shortage is a major constraint to urban farmers hence the need to

recycle grey water for crop production, while at the same time conserving the environment through reduced disposal of grey water on roads. This concurs with other findings in this study in Table 4.13 which shows that most respondents who agreed that reuse of grey water on farms reduce discharges to the environment were mostly using piped water, rain water/water vendors, as main source of water for farming in Kisumu, Kakamega and Eldoret towns. FGD findings also reveal that water shortage is one of the biggest challenges faced by the farmer, hence reuse of grey water provides many benefits namely; improving sanitation of the environment, reducing cost of water, providing water for irrigation, besides reducing odour due to discharges in the environment.

Similarly, a 2-way interaction effect existed between food nutrition and poultry keeping yielding high income. During FGD discussions, urban farmers noted that grey water is essential for growing vegetables for domestic use. From the lens of General systems theory, there appears to be some interconnectedness between the urban farmer (human interaction), conservation of the environment through recycling of greywater(environment), and the government (social organization). Lai & Lin (2017) asserts that the systems theory focuses on three levels of observations: the environment, the social organization as a system, and human participants within the organization. Moreover, the practice of reuse of greywater is a best practice as it conserves the environment. According to Bassey (2020), the theory of Regulatory compliance tries to link compliance with regulations to best practices by stakeholders. Thus, the recycling of greywater is a best practice that is beneficial to planning, the environment and urban farmers.

## 4.6 The Effect of Planning Legislative Framework on Urban Agriculture

The second objective of the study was to investigate the effects of planning legislative framework on urban agriculture in the selected towns in Western Kenya. The main features of planning legislative framework that were investigated included; planning policies, regulations, laws enforcement and compliance, and taxation and penalties.

### 4.6.1 National Policies and Urban Agriculture

The study sought to understand the relationship between commodity produced such as eggs, vegetables (kales and local vegetables), and milk, and perception of respondents on whether or not the national land policy supports UA activities. Table 4.18 presents the distribution of farm commodities produced with support of existing land policy.

**Table 4.18: Commodity Produced and National Land policy supportive of UA activities**

Name of town			National Land policy supports UA		Total
			Yes	No	
Kisumu	Commodity produced	Eggs	28.0%	72.0%	100.0%
		Kales	37.5%	62.5%	100.0%
Kakamega	Commodity produced	Milk	55.6%	44.4%	100.0%
		Eggs	37.5%	62.5%	100.0%
		Kales	35.0%	65.0%	100.0%
		Local veges	28.6%	71.4%	100.0%
Eldoret	Commodity produced	Milk	21.7%	78.3%	100.0%
		Eggs	11.8%	88.2%	100.0%
		Kales	47.1%	52.9%	100.0%

Results from Table 4.18 show that most respondents who were producers of eggs, kales, and local vegetables maintained that national land policy does not support UA in all towns, except in Kakamega where most milk producers affirmed that national Land policy supports UA in Kakamega but not in Eldoret town. This finding shows that majority of respondents who produced eggs, kales, and local vegetables did not affirm that national land policy is supportive of UA. This finding concurs with provisions of section 3.4.1.4 of the National Land Policy of

2009, which explicitly states that urban agriculture has not been properly regulated and facilitated, and goes ahead to emphasize the promotion of multi-functional urban land use and the establishment of an appropriate legal and regulatory framework for urban agriculture as ways of integrating it into development planning (Kenya, 2009). Similarly, section 3.7 of the Land Use Planning Draft Policy 2016, on urban land uses, also asserts the need to encourage sustainable urban agriculture (Kenya, 2009; Kenya, 2016). The fact that sampled farmers did not view national policies as supportive of UA is a pointer to inadequate implementation of the land policy as a regulator of land use.

Previous studies including those done in developed countries have also documented lack of clarity in existing land policies as far as they interact with UA. For instance, Castillo et al (2013) concluded in a study done in Chicago that urban and peri-urban farmers commonly are being forced to operate within a legal limbo or petition for exceptions to a variety of regulations. Cinà and Khatami (2017) conducted a study that sought to point out the factors that hinder or favour urban agriculture in Iran which concurred that the three main factors that can favour effective policies and practices for multifunctional urban agriculture are policy, education, and social commitment. The presence of a supportive policy for UA would therefore be necessary for authenticating the practice of UA as a legal practice.

#### **4.6.2 Planning Laws and Regulations, and Urban Agriculture**

All over the world, developmental activities are controlled by planning laws and regulations. In the same vein, urban agriculture is controlled by many legislations and by-laws which are either enacted at the national assembly or county assembly. These laws include the physical and land use planning Act (PLUPA) No. 13 of 2019, county legislations, and National Environmental Management Act (NEMA). Oladele, Olufunke, and Adeoti (2012) argue that programmes and

legislation can be introduced to institutionalize urban agriculture, reduce the contamination of wastes, modify agricultural practices, and educate cultivators. So far in Kenya, a few county governments have led the way in this direction namely Nairobi and Kiambu. Kenya (2015) gazette notice on Nairobi City County Urban Agriculture Promotion and Regulation Act, 2015 part II (5) ensures the inclusion of urban agriculture in the planning process as a component of land use and food policy and zoning, marketing and market infrastructure (Kenya, 2015). This is the first time in the history of Kenya that a county government has legislated on such a controversial issue as urban agriculture thereby setting the pace for other county governments to follow suit. This paradigm shift is bound to persist in the future since such county legislations are now supported by certain articles embedded in key national legislations such as the Urban Areas and Cities Act and the land policy, (Kenya, 2012 & Kenya, 2009). The researcher, therefore, enquired from the sampled farmers to indicate how regulations on land use designations or allotment of open spaces are beneficial to them, with regards to the permission of UA in open spaces. Table 4.19 presents the distribution of respondents by land use permission of UA on open spaces and regulations on land use designations.

**Table 4.19: Plot Size and Regulations on land use designations/allotment of open spaces are beneficial to UA farmer**

Name of town			Regulations on land use designations/allotment on open spaces are beneficial to farmers		Total
			Yes	No	
Kisumu	Plot size	Below 100m sq.	25.7%	74.3%	100.0%
		501-1000m sq.	0.0%	100.0%	100.0%
Kakamega	Plot size	101-500m sq.	24.0%	76.0%	100.0%
		501-1000m sq.	0.0%	100.0%	100.0%
		Above 3000m sq.	0.0%	100.0%	100.0%
Eldoret	Plot size	Below 100m sq.	0.0%	100.0%	100.0%
		101-500m sq.	75.0%	25.0%	100.0%
		501-1000m sq.	100.0%	0.0%	100.0%

Results from Table 4.19 show that the majority of respondents with various plot sizes maintained that regulations on land use designations/allotment on open spaces were not beneficial to farmers

in Kisumu and Kakamega, while in Eldoret town those with plot sizes 101-1000m sq. said that regulations on land use designations or allotment of open spaces were beneficial to UA farmers. Interestingly, Table 4.30 indicates that plot size cases were not uniform across the three towns. The table was based on direct responses from individual farmer interviews in these towns, and apparently, there were no responses about certain plot sizes. It is noteworthy to observe that Kisumu and Eldoret both had responses up to a maximum plot size of 1000m<sup>2</sup> while Kakamega town had plot sizes up to a maximum of above 3000m<sup>2</sup>. This implies that there were much bigger plots in Kakamega than in Kisumu or Eldoret, perhaps alluding to the level of urbanization of these towns. Elsewhere in this study in Table 3.1, when urbanization percent was calculated by the researcher, Kakamega was 58% urbanized, Kisumu 90% urbanized, and Kericho 93% urbanized.

This finding shows that, although the majority of the respondents with various plot sizes maintained that regulations on land use designations or allotment of open spaces were not beneficial to urban farmers in Kisumu and Kakamega, only a few urban farmers in Eldoret town maintained it was beneficial. Mubvami & Mushamba (2006) concur that urban agricultural practices have always been part of the city, but integration into the urban economy is what is lacking in today's urban planning and policies. Similarly, Foeken (2006) and Kamwele et al (2014) also concur that in many African countries, many urban farmers operate without formal recognition due to lack of structural support and proper municipal policies and legislation for urban agriculture. Mireri (2005) pointed out that the by-laws do not recognize urban agriculture as legitimate land use. The researchers (Kamwele et al, 2014; Simuyu & Foeken, 2011; Mireri, 2005) appear to decry the absence of formal recognition, appropriate legislation, and relevant by-laws. Based on the finding of this study, urban agriculture is not necessarily legal but allowed,



since it is already incorporated into the national legislation, although so far, no specific county legislation has been enacted that officially legitimizes the practice at the county level. Since the county legislations are usually derived or domesticated from national policies and laws, it means urban agriculture is allowed but operates under other government laws like public health, NEMA, Physical and land use planning regulations framework among others.

An interview with one of the County Directors of Physical planning indicated that UA activities are allowed although, the growing of tall crops is usually discouraged. During the discussion, it also emerged that the practice of backyard farming is also discouraged due to a notion among urban dwellers known as "Not In My Backyard (NIMBY)". This was captured in a statement by one planner;

*Planning usually allows the cultivation of crops in residential plots, as long as the crops do not grow higher than one metre. However, the notion among urban dwellers of "Not in My Backyard, (NIMBY)", often discourages farming in backyards, especially in core urban areas. (County Director of Physical Planning-2)*

The statement from the County Director of Physical Planning -2 seems to suggest that urban agriculture activities are discouraged in urban residential plots due to the prevailing attitude of "Not In My Backyard" (NIMBY) among town dwellers. Brown & Glanz (2018) describe the terms NIMBY (Not-In-My-Back-Yard) and YIMBY (Yes-In-My-Back-Yard) as negative and positive public attitudes toward proposed development projects, respectively. Specifically, YIMBY refers to people who promote local development close to where they live, whereas NIMBY is defined as a social response to undesirable facilities, commonly dubbed Locally Unwanted Land Uses (LULUs) (Brown & Glanz, 2018). Wu et al. (2002) assessed the advantages of urban open space and cropland with various nearby public facilities that were deemed to be locally undesirable ("not in my backyard," NIMBY) or desirable ("yes in my backyard," YIMBY). They discovered that, for individual housing units, the total damage is

1.87% of the average housing price for cropland-type open space with adjacent NIMBY or YIMBY facilities, and the total benefit is 7.43% of the average housing price.

The researcher additionally enquired whether the sampled urban farmers were aware of any regulations prohibiting livestock keeping in their respective towns. Table 4.20 presents the distribution of awareness of livestock keeping prohibition in the towns based on the type of livestock.

**Table 4.20: Type of Livestock Kept and Awareness of livestock keeping prohibition in town by Town Authorities**

Name of town			Awareness of livestock keeping prohibition in town by town authorities		Total
			Yes	No	
Kisumu	Type of livestock	Local	32.2%	67.8%	100.0%
		Exotic	100.0%	0.0%	100.0%
Kakamega	Type of livestock	Local	47.2%	52.8%	100.0%
		Exotic	100.0%	0.0%	100.0%
Eldoret	Type of livestock	Local	73.1%	26.9%	100.0%
		Exotic	68.6%	31.4%	100.0%

Table 4.20 indicates that except in Eldoret town, majority of respondents keeping local livestock were not aware of prohibition of livestock keeping in town both in Kisumu and Kakamega. Majority of exotic livestock keepers were aware of prohibition of livestock keeping in all towns. Overall, this finding shows that, whereas most local livestock keepers were not aware of prohibition of livestock keeping in town, majority of exotic livestock keepers were aware in all towns. Despite livestock keeping being prohibited in town by most municipal by-laws, the practice especially of keeping poultry and dairy was common due to the high returns accrued from such ventures. The proximity to market within an urban area and the high returns seem to be driving most urban farmers to livestock farming in town. An interview with one Town planner indicate that the

Physical and land use planning regulations are the statute that was being used to regulate locally unwanted land use (LULUs) activities in town. This was captured in a statement:

*Despite livestock keeping being prohibited in town by most municipal by-laws, the practice especially of keeping poultry and dairy was common due to the high returns accrued from such ventures. The proximity to market within an urban area and the high returns seem to be driving most urban farmers to livestock farming in town. Livestock keeping especially dairy and poultry keeping are commonly practiced by town residents especially in low-density residential areas, perhaps due to the high returns they accrue and the ready market for produce in town. However, the town management authorities are regulating these activities using the Physical and land use planning regulations framework, which was approved by the Director of Physical Planning in Nairobi, and also by the County Assembly (Town Planner 3)*

The Town Planner's declaration demonstrates that the national physical and land use planning rules framework has been domesticated for use at the county level, even if there are no special county laws that have been launched and produced by the county to control urban agriculture. As a result, it is clear that there are no legal voids because adopted national laws and regulations have been used to replace any gaps in the law caused by the repeal of the previous local bylaws.

This finding concurs with other studies, which contend that municipalities were filling policy and legal gaps by enacting enabling ordinances, regulating urban agriculture production, using fiscal policy tools (such as taxes and penalties), amending the city master plan to set up goals for urban agriculture, promoting urban agriculture as a component of the city's economy, and changing the purpose and intent of the zoning ordinance to regulate agriculture, among other things (Mahbubur, Morales, & Bonarek, 2017).

Further FGD discussions confirmed that apart from prohibition of livestock keeping, certain UA activities are also prohibited in town due to environmental conservation reasons. For example, members observed that the construction of certain structures like greenhouses may require one to meet certain pre-conditions from National Environmental Management Authority (NEMA). This was well illustrated by one FGD as follows:

*I am in a group that was formed in the year 2007 after Post-Election Violence with the sole aim of growing vegetables for household consumption and sale. Later, the group was lucky to have received a greenhouse for vegetable production from the county government. However, before constructing the greenhouse, we had to conduct an Environmental Impact Assessment (EIA) as a planning pre-condition as per National Environmental Management Authority (NEMA) Act and regulations. This delayed the project as we could not get enough funds to comply with this requirement, (FGD-3).*

This statement from this FGD-3 shows that although some UA activities are permitted, farmers are expected to comply with certain planning pre-requisite conditions which hinder UA project implementation since such costs are never factored in during project design. Studies show that most municipalities have tended to discourage or prohibit urban agricultural activities primarily due to health reasons (Guendel, 2002; Kenya, 2004; World Bank, 2002). Some of the health reasons militating against urban agriculture include the claim that crop production provides breeding grounds for mosquitoes and diseases. Also, governments have not recognized the legal existence of urban farming, and have made very little provision for research and extension of urban farming techniques while planners, (World Bank, 2002). A further interview with one planner revealed that planning does not "support" but "allows" UA. "Allowing" means that it is permissible within a given zoned area while "Supporting" means facilitating, promoting, or championing UA. One planner said;

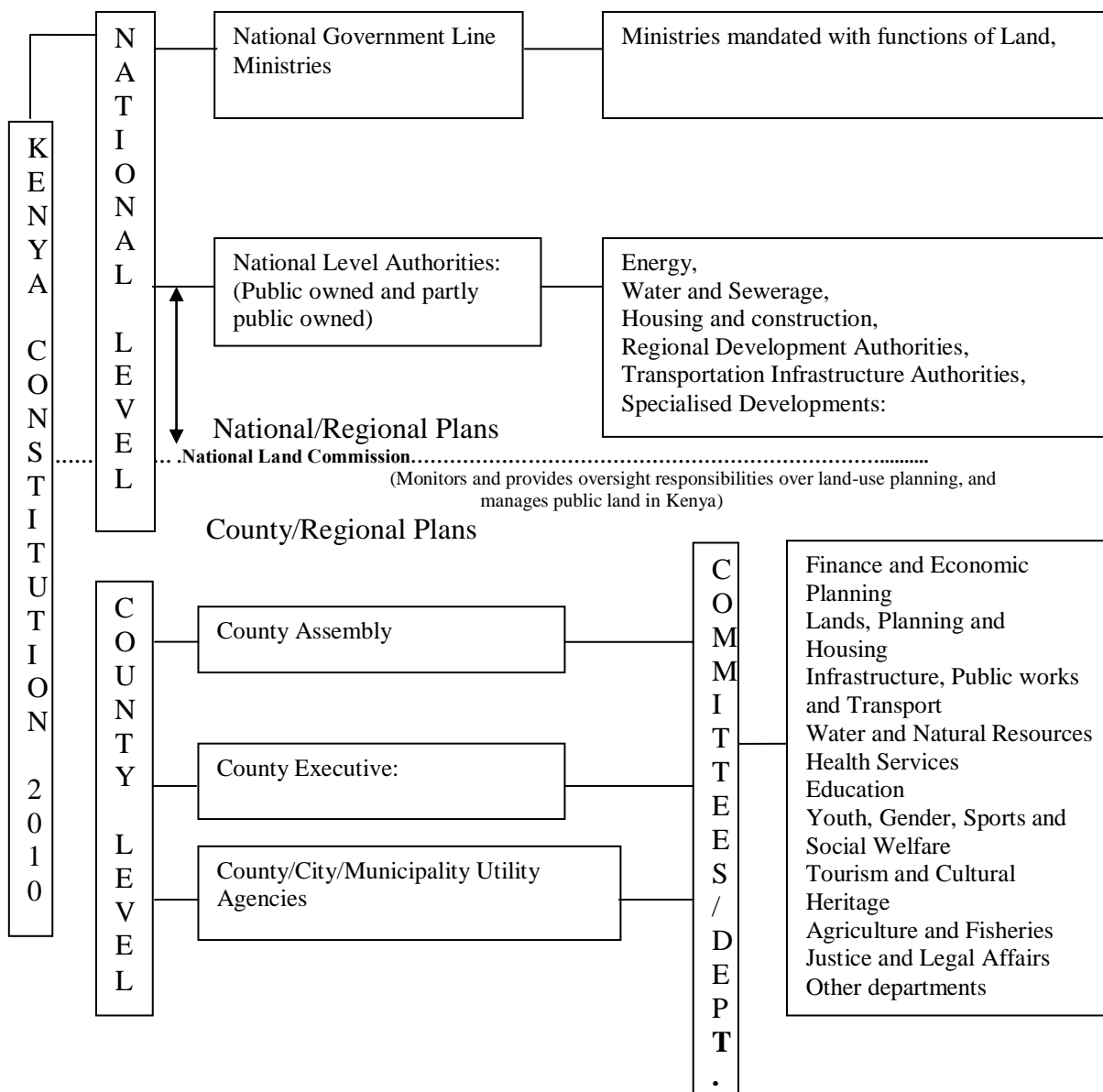
*At the moment, planning does not "support" but simply "allows" urban agriculture. There is a clear distinction between the two terminologies; "allow" means it's a necessary evil that we may do away with it, but we cannot. "Supporting or promoting" means championing UA. Although UA is allowed, a bit of championing (supporting) for UA activities among planners is what is lacking (County Director of Physical Planning-3)*

According to the statement from Planner-3 urban agriculture is allowed but not supported. However, this position of the planner contradicts the provisions of Sessional Paper No.13 of National Land policy section 3.4.1.4 (110) of the policy states that urban agriculture has not been properly regulated and facilitated, while sec (111(a) & (b) emphasizes the promotion of multi-

functional urban land use, and putting in place an appropriate legal framework to facilitate and regulate urban agriculture. On the other hand, Urban Areas and Cities Act 2012 section 36. (1) stipulates that every city and municipality shall operate within the framework of integrated development planning, which shall provide a framework for regulated urban agriculture. Therefore, Planning has allowed for the inclusion of urban agriculture through integrated development planning and provision of the regulatory framework but has not supported the actual implementation of the practice.

#### **4.6.2.1 Planning Institutional Context in Kenya**

Planning institutional context refers to the planning administrative framework that executes planning functions in urban areas. The study reviewed literature that showed that the planning institutional context in Kenya comprises two tier-level governments, formal institutions consisting of ministries, authorities, county assembly, executive context, County/City/Municipality Utility Agencies, and committees. The three components of planning institutional context include governance, organizational and administrative structure are illustrated in figure 4.1.



**Figure 4.1: Planning Institutional Context in Kenya (Source: UN-Habitat (2018))**

Based on this planning institutional context (Fig.4.1), land use planning in Kenya is guided by the supreme law which is the constitution of Kenya 2010. According to the Constitution, the state can regulate the use of any type of land, including private land as stated in Article 66 (1) "The State may regulate the use of any land, or any interest in or right over any land, in the interest of defence, public safety, public order, public morality, public health, or land use

planning." (Kenya, 2010). This implies that the national legislations for land use planning are derived from the Constitution, while the county legislations and by-laws must also be aligned to the national policies and legislations. Under Schedule Four of the Constitution of Kenya, planning functions are distributed across two tier levels of government namely; national and county governments (Kenya, 2010). National level institutions mostly include; national government line ministries mandated with functions of land, spatial planning, infrastructure and services, housing, environment, agriculture and urban development.

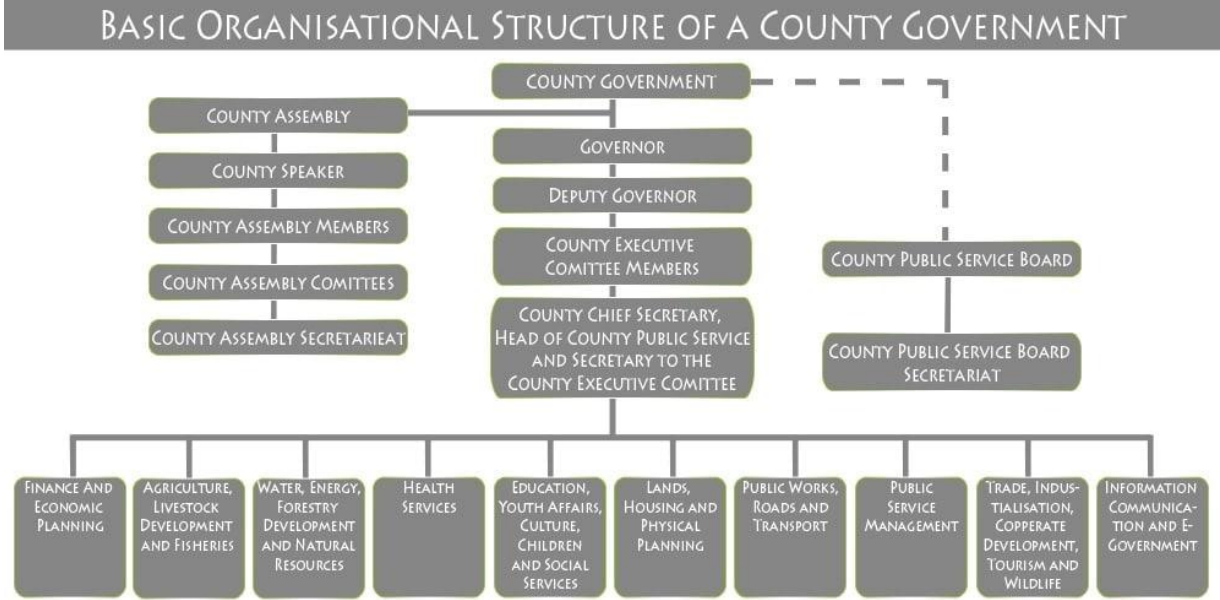
Under schedule Four of the constitution, planning functions are distributed across two tier levels of government namely; national and county governments (Kenya, 2010). National level institutions mostly include; national government line ministries mandated with functions of land, spatial planning, infrastructure and services, housing, environment, agriculture, and urban development. The national level planning authorities are mostly public owned or partly public owned, with planning functions cutting across the line ministries. Public planning authorities play critical roles in ensuring planning systems are efficient and fit for purpose. The authorities have specific planning functions such as plan formulation, enacting planning legislative framework, developing regulations, and other functions. In addition, there is a National Land Commission that is responsible for oversight and is mandated to monitor land use planning throughout the country, (Kenya, 2010 and UN-Habitat, 2018). Thus, planning functions are distributed across the two-tier levels of government, but with provisions for coordination across the two levels, (UN-Habitat, 2018). At the national government level, departments and parastatal agencies within various ministries are tasked with urban planning and development functions.

At county level, planning functions are prescribed by the constitution, County Governments Act, and Urban Areas and Cities Act. Furthermore, planning authorities are envisaged to operate at

different levels in the counties. Whereas the County Governments Act designates county departments and decentralized units as planning authorities in a county, the Urban Areas and Cities Act designates urban boards and committees as planning authorities, in the case of planning for cities and towns. (UN-Habitat, 2018). Planning functions at the county level are executed through three bodies which include; the County Assembly, County Executive, and City or Municipality Utility Agencies that are in charge of water and sewerage, solid waste management, and energy among others. The county Assembly plays a legislative and oversight role, plans and approves budgets, and works with sectoral line departments. These bodies work closely with established committees and departments to ensure the proper execution of planning functions. On the other hand, the County/City/Municipality utility agencies are in charge of providing service delivery on water and sewerage, solid waste management, and energy among others, (UN-Habitat, 2018).

The administrative structure is one of the key components of planning administration; hence the inclusion of urban agriculture unit in such a structure would be essential in ensuring its integration in urban planning. Within the county, the county government is headed by a Governor, a deputy Governor, County Executive Committee Member, and a county Secretary, who heads the public service. Several departments constitute the public service, with the department of lands, housing and physical planning, and the department of Agriculture, Livestock Development, and Fisheries being the two key departments that relate to urban agriculture, (Kenya, 2018). Figure 4.2 denotes the basic organizational structure of a county government.

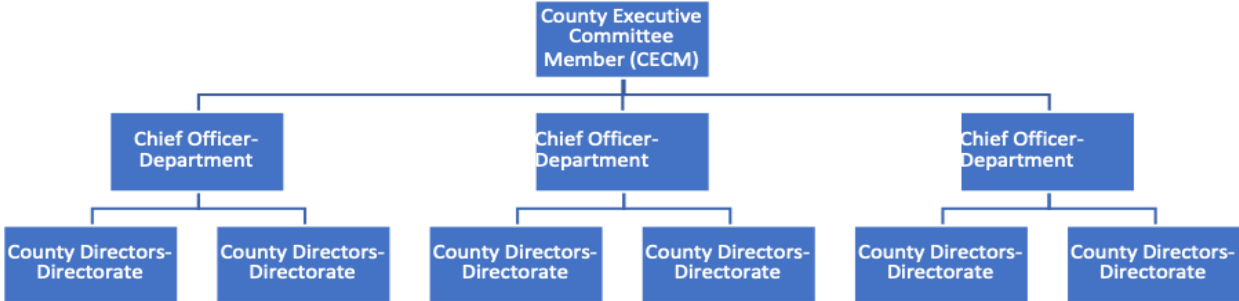




**Figure 4.2: Basic organizational structure of a county government in Kenya, (Source: Kenya, 2018)**

At departmental level, the departments, for instance, the departments of physical planning is headed by a County Executive Committee Member (CECM), the Chief Executive, followed by Chief Officer, County Directors, Sub-county Officers and Ward Officers at the lowest level.

Figure 4.3 shows a proto-type of the new administrative structure at county level.

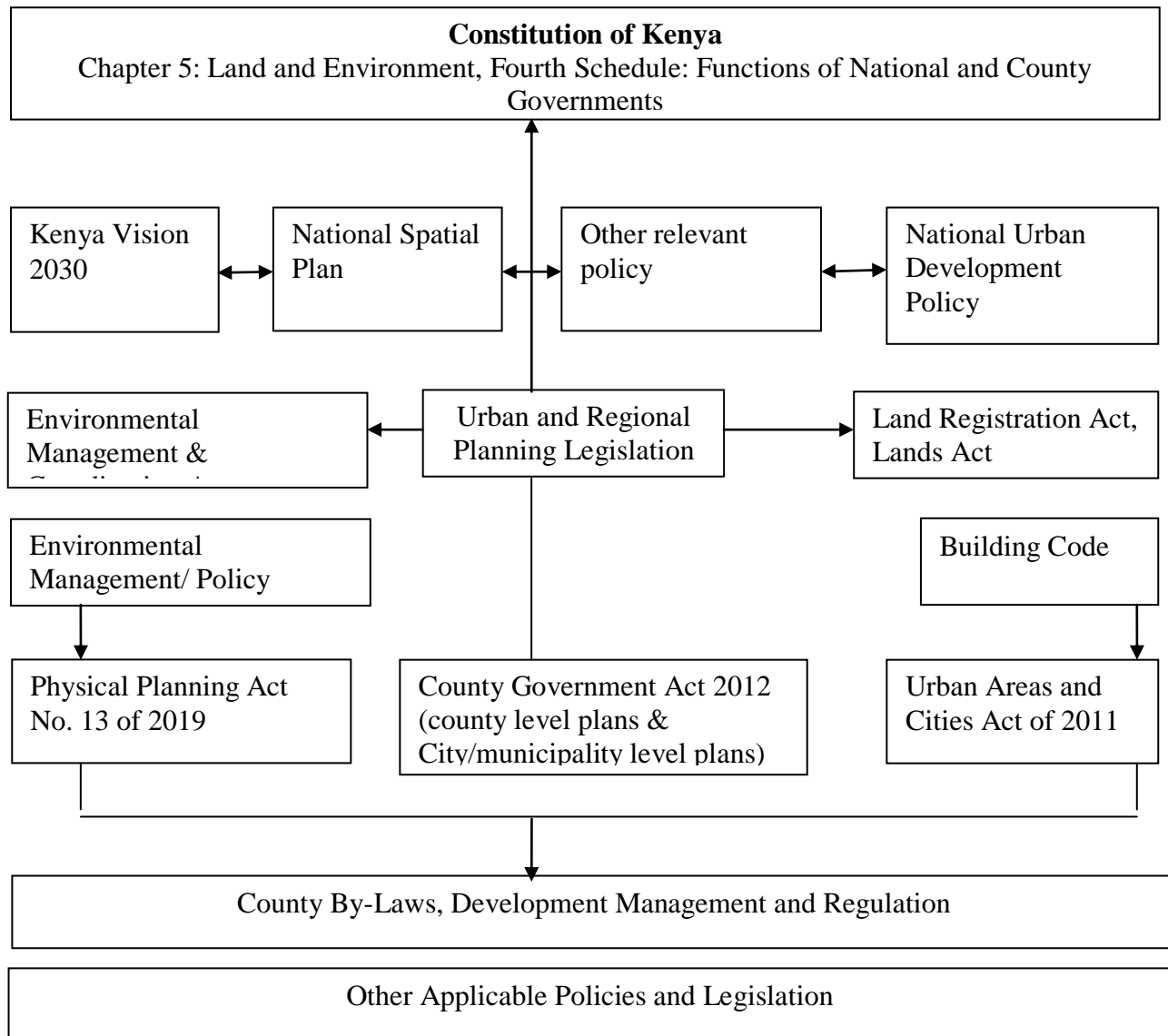


**Figure 4.3: Basic Organizational Structure for County government departments (Source: Kenya, 2018)**

The foregoing discussions show that good governance (planning administration) ensures that the relationship between actors in urban development enhances the sustainability of cities in terms of how development activities are coordinated (Smit, 2016). However, whereas the existence and activities of urban planning governance are well documented in developing countries, the same seems scanty in developing countries including Kenya (Reynolds, 2011; Stojanović et al, 2016). Similarly, the majority of studies focusing on urban governance in Africa (Fuseini, 2016; Mohammed & Ahmed, 2017; Abiodun, et al, 2018) have revealed lack of coordination among governing institutions including political leaders. Moreover, how planning governance has influenced urban agriculture practice tends to have attracted limited documentation as far as existing literature is concerned. From the foregoing discussion on planning institutional context, it is apparent that there is no specific body or unit within the organizational structure that deals with urban agriculture.

#### **4.6.2.2 Planning Policy and Legislative Framework in Kenya**

Literature review, through document analysis of government policy documents in Kenya, revealed that the planning policy and legislative framework, that influences urban agriculture in towns is comprised of; the constitutional, policy, and legal context. The major planning legislative frameworks that guide urban agriculture that relate to spatial land use planning in Kenya include; the constitution of Kenya of 2010, the Sessional Paper No.3 of Land Policy of 2009, the Land use planning draft Policy 2016, the Physical Planning Act No. 13 of 2019, county government Act, 2012 and Urban Areas and Cities Act (UACA) of 2012, Public Health Act and National Environmental Authority Act (NEMA). Fig. 4.4 shows the Policy and legislative Framework for Spatial Planning in Kenya.



**Figure 4.4: Policy and legislative Framework for spatial planning in Kenya Source: (UN-Habitat, (2018)**

However, despite the existence of this robust policy and legal framework especially at the national level, the land policy of 2009 asserts that urban agriculture is still not adequately facilitated and regulated in Kenya (Kenya, 2009). The Constitution of Kenya, article 43 stipulates that urban land use plans are essential instruments to realize constitutional rights for urban citizens. These rights include; having a clean and healthy environment, environmental protection for the benefit of present and future generations, the highest attainable standard of

health, accessible adequate housing, reasonable standards of sanitation, and clean and safe water in adequate quantities, (Kenya, 2010). Article 60 of the constitution of Kenya, further recognizes the role of urban land use planning as a fundamental factor in achieving the principles of Land Policy, (Kenya, 2010). These rights together with principles of land policy do impact urban agriculture since the practice has both pros and cons, some of which may infringe on the right of others in towns.

Additionally, section 43 (c) under the Bill of Rights, the Constitution stipulates that “every person has the right to be free from hunger and to have adequate food of acceptable quality”, (Kenya, 2010). This may imply that urban citizens who are food insecure have some “right” to grow crops and keep some livestock in towns to mitigate their food insecurity. Agriculture is a devolved function, with national government dealing with policy formulation and capacity building, while the county government is concerned with the provision of agricultural extension to farmers. Some of the key national policies that directly influence the practice of UA include: the land policy and Kenya's Vision 2030, The Sessional Paper Number 3 of 2009, and the Land use planning draft policy 2016 (Kenya 2009 and Kenya, 2016).

Kenya Vision 2030 is a long-term development blueprint for the country that aspires for Kenya to become "a globally competitive and prosperous country with a high quality of life by 2030". It also relates to urban agriculture with regard to improving quality of life for all its citizens. Also, the vision identified Kisumu, Kakamega, and Eldoret among the other six metropolitan regions, as towns for implementation of flagship projects on urbanization and housing, (Kenya, 2007). Other national policies that may influence UA include National Urban Development Policy (NUDP) and National Spatial Plan as well as the National Agriculture Policy (NAP) among others.

In terms of planning laws, the principal laws guiding urban land use planning that relate to UA activities include the County Governments Act 2012, the Urban Areas and Cities Act 275, and the physical planning and land use Act No. 13 of 2019. Plans developed by the planning administration are often backed by planning legislative frameworks. According to the County Government Act of 2012, part XI on county integrated planning, it is the responsibility of the County Planning Unit and Physical Planning department, under the oversight of the County Executive Committee, to make both county level plans and city level/municipal level plans (Kenya, 2012). The county-level plans usually include a county development plan, also known as a County Integrated Development Plan (Kenya, 2018a), county sectoral plans based on Kenya (2018a), and a County Spatial Plan, which is a ten (10) year spatial development framework for the county.

Urban farmers must be involved in the development, execution, and evaluation of plans since they may aid in integrating UA into planning, therefore this is a crucial point to make. The County Government Act of 2012 gives the planning department the authority to create a variety of plans, such as regional physical development plans (RPDP), local physical development plans (LPDP), long-term, short-term, renewal, and redevelopment plans (Kenya, 2019). The Part Development Plan (PDP), zoning or advisory plans for land subdivisions and densities, subject/sectoral plans including transportation plans, water supply and sewerage plans, among others, are some examples of such plans (Kenya, 2019).

A town management board is responsible for regulating land use, land subdivision, land development, and zoning by the public and private sectors for any purpose, including industry, commerce, markets, shopping and other employment centers, residential areas, recreational areas, parks, entertainment, passenger transport, agriculture, and freight and transit stations

within the framework of the Urban Areas and Cities Act (UACA) 2012 article 20 sections I and (d). UACA article 40 (a, b & c) assert that an integrated urban area or city development plan shall reflect a board's vision for the long term development of the city or urban area. It also states that such plans should include an assessment of the existing level of development in the city and identify communities which do not have access to basic services.

UACA under article 36 section (f) sets out the objectives of integrated urban areas and city development planning as that of providing a framework for regulated urban agriculture, while section (g) forms the basis for development control. UACA stipulates under article 40 subsection (1) that an integrated urban or city development plan shall bind, guide, and inform all planning development and decisions and ensure comprehensive inclusion of all functions. A thorough inclusion of all functions is guaranteed by an integrated urban or city development plan, which is required by UACA's Article 40, subparagraph (1), to bind, guide, and inform all planning development and decisions.

Based on the reviewed literature in this section, the studies indicate that although urban agriculture exists, it does not have a specific planning policy, and various barriers such as financial resources, legal regime (administration), and institutional setup among others, hinder its implementation (Kamwele, Wagah, Onyango and Nyström, 2014; and Kitur, 2019). This implies that planning policy and legislative framework do influence the implementation of urban agriculture in Kenya.

#### **4.6.3 Law Enforcement and Compliance**

Taxes and penalties act both as incentives and mitigating measures to regulate UA activities in town. Whereas the taxes on UA produce do generate revenue for the town management,

penalties are punitive measures put in place by laws and regulations to regulate urban agriculture. This study, therefore, sought to create a better understanding of how law enforcement and compliance, with regard to taxes and penalties, have influenced UA activities in the three towns.

#### 4.6.3.1 Taxation

**Table 4.21: Commodity produced and Tax charged on UA produce are fair**

Name of town			Tax on UA produce is fair		Total
			Yes	No	
Kisumu	Commodity produced	Milk	100.0%	0.0%	100.0%
		Eggs	77.3%	22.7%	100.0%
		Kales	0.0%	100.0%	100.0%
Kakamega	Commodity produced	Milk	75.0%	25.0%	100.0%
		Eggs	37.5%	62.5%	100.0%
		Kales	53.3%	46.7%	100.0%
		Local veges	100.0%	0.0%	100.0%
Eldoret	Commodity produced	Milk	17.4%	82.6%	100.0%
		Eggs	0.0%	100.0%	100.0%
		Kales	0.0%	100.0%	100.0%
		Local veges	0.0%	100.0%	100.0%

Table 4.21 shows that respondents who were producing milk, except for Eldoret town, majority asserted that tax charged on milk by planning authorities was fair in Kisumu and Kakamega towns. Those respondents producing eggs, except for Kisumu town where taxes were fair, majority maintained that taxes charged on eggs were not fair in Kakamega and Eldoret. Similarly, majority of those producing local vegetables maintained that tax charged on local vegetables were fair or not fair in equal proportions in Kakamega and Eldoret towns respectively.

This finding shows that the urban farmers were being affected negatively by their inclusion in the tax net espoused by the government. Tax charged on milk by planning authorities was fair or not fair in Kisumu and Kakamega towns respectively, according to respondents. Majority of

those producing local vegetables maintained that tax charged on local vegetables were fair or non-existent in Eldoret town. Tax charged on eggs also varied from one respondent to the other. OECD (2019) concurs that tax policy can affect innovation, productivity and sustainability in the food and agriculture sector through decisions of firms and households to save or invest in physical and human capital, with implications for the adoption of innovation. Miles, Boumbakare and Gerold (2019) confirms that many developing countries ignore collection of taxes in the farming sector, or exempt farm-based incomes altogether, however, Kenya and Pakistan, provide examples of proactive efforts to include farmers into the tax net. OECD (2019) concurs that tax policy is often used as a lever through which to affect behaviour in the agricultural sector, impacting producer income, farm land transfer, investment, innovation, and sustainability outcomes.

However, taxes or tax concessions in one area provide incentives that are contrary to the achievement of policy goals in other areas. The tax charged on UA produce were generally unfair to urban farmers, which is a reflection of the efforts of government of Kenya to include farmers in the tax net in the three study towns. This finding concurs with Mahbubur, Morales & Bonarek, (2017) that suggests use of fiscal policy instruments such as use of taxes and penalties are some of the interventions that can be adopted to fill policy & legal vacuums in a municipality. Indeed, the use of taxes and penalties as “carrot and stick” or rewards and sanctions to UA, were being implemented widely thus affecting urban farmers negatively within the three towns. Tax reduction can act as an inducement, or reward, while penalties or sanctions are punitive measures against a practice. Both tax and penalties are therefore meant to make UA sustainable, in the long run. These two aspects of planning have the potential to integrate UA into urban planning, if properly applied under an appropriate legislative framework.



**Table 4.22: Gender and Licensing fee charged on UA -related business are favourable**

Name of town			Licensing fee charged on UA -related business are favourable		Total
			Yes	No	
Kisumu	Gender	Male	14.3%	85.7%	100.0%
		Female	20.0%	80.0%	100.0%
Kakamega	Gender	Male	17.5%	49.1%	66.7%
		Female	36.8%	63.2%	100.0%
Eldoret	Gender	Male	23.9%	36.6%	60.6%
		Female	0.0%	100.0%	100.0%

Results from Table 4.22 indicate that majority of both male and female respondents disagreed that licensing fees charged on UA -related businesses were favourable in Kisumu, Kakamega, and Eldoret. In short, the majority of respondents felt that the licensing fees charged on UA-related businesses were unfair hence negatively affecting their operations by reducing their income. Miles, Boumbakare, and Gerold (2019) concur that currently, the most popular revenue-generating activities in low-income countries use indirect methods: typically, fixed fees such as license fees, land fees, and trading fees.

These fees can be imposed easily, often at a single location. For example, Rwanda applies a trading license fee to farmers who wish to sell their products commercially. OECD (2019) concurs that tax credits or reduced tax rates (either on income or, in some cases, on labour costs) theoretically incentivize innovation by reducing the relative cost of that activity, but the extent to which this occurs is highly dependent upon the policy's design. Moreover, Miles, Boumbakare, and Gerold (2019) argue that attitudes are shifting in some countries, where the conventional wisdom that farm subsidies and tax exemptions are helpful is being eschewed since there has been little evidence of clear cause and effect between tax exemptions and farm activity. Additionally, during the discussion with Chief Officer-Agriculture, Livestock & Fisheries, the researcher gathered that there were no special licensing fees or exceptions for urban farmers.

Indeed, it emerged that, just like business premises, people selling UA produce were expected to pay for permits for selling farm produce. An outstanding statement captured by the researcher was that:

*At the markets, there are the usual permits that one pays for to sell one's produce. There is no special consideration in terms of the fee paid or taxes charged on UA produce. For those selling food products like milk, there are even more requirements like public health permit (Chief Officer-Agriculture, Livestock & Fisheries)*

The statement from Chief Officer-Agriculture, Livestock & Fisheries implies that licensing fee charged to farmers, including urban farmers, were fair, although farmers were paying fee for selling the produce and licenses for operating premises where produce are sold. In a nutshell, tax and licensing fees, as tools of generating revenue, had a negative influence on UA activities in the three different towns, despite these tools being considered as incentives or disincentives in the facilitation and regulation of UA.

#### **4.6.3.2 Penalties**

Concerning penalties, the researcher sought the views of the respondents regarding penalties imposed for non-compliance by the municipal authorities.

**Table 4.23: Commodity Produced and Penalties imposed for non-compliance to Regulations of UA are fair**

Name of town	Penalties imposed for non-compliance to regulations of UA fair	Total			
		Yes	No		
Kisumu	Commodity produced	Milk	0.0%	100.0%	100.0%
		Eggs	32.0%	68.0%	100.0%
		Kales	100.0%	0.0%	100.0%
Kakamega	Commodity produced	Milk	83.3%	16.7%	100.0%
		Eggs	100.0%	0.0%	100.0%
		Kales	0.0%	100.0%	100.0%
		Local veges	0.0%	100.0%	100.0%
		Milk	17.4%	82.6%	100.0%
Eldoret	Commodity produced	Eggs	0.0%	100.0%	100.0%
		Kales	0.0%	100.0%	100.0%
		Local veges	0.0%	100.0%	100.0%

Table 4.23 shows that except in Kakamega town, most milk and egg producers maintained that penalties imposed for non-compliance to regulations of UA were not fair in Kisumu and Eldoret towns. Similarly, except in Kisumu, Kales and local vegetable producers asserted that penalties imposed for non-compliance to regulations of UA were not fair in Kakamega and Eldoret towns. Overall, this study finds that the majority of the urban farmers who produced various commodities maintained that penalties imposed for non-compliance to regulations of UA were not fair, while only a few milk, egg, and kales producers were of a contrary opinion in Kisumu and Kakamega towns. Further interviews with planners on the same issue, revealed that farmers were sometimes given exemptions with regard to compliance and enforcement of environmental standards, depending on the kind of type of agricultural production activity being carried out.

This was captured in a statement by one planner:

*Vegetable and fruit tree growing are considered permissible activities, but there is no framework for poultry keeping. However, as long as we do not have complaints from neighbourhood, we do not interfere. But when there is a complaint, we enforce the law by restating it is not permissible user (Town Planner 1).*

The statement emerging from Planner-1 implies that compliance and law enforcement of environmental standards is carried out in an ad hoc manner, such that the standards are only enforced when there are complaints from the public regarding pollution, while other times it does not concern the enforcers. This suggests that there is weak law enforcement on UA activities by planning authorities. Vegetable growing is permitted because it is a short-growing crop, while fruit trees are beneficial for providing shade that creates micro-climates hence mitigating the effects of hot weather. The fact that enforcement is only done when there is a complaint means that certain aspects of urban agriculture, are permissible as long as they are compliant with the law.

**Table 4.24: Municipal by-laws regulating UA are enforced strictly and Zoning Ordinance permits crop cultivation within plots in town**

Name of town			zoning ordinance permits cultivation of crops within plots in town		Total
			Yes	No	
Kisumu	Municipal by- laws regulating UA are enforced strictly in town	Yes	88.6%	11.4%	100.0%
		No	100.0%	0.0%	100.0%
Kakamega	Municipal by-laws regulating UA are enforced strictly in town	Yes	0.0%	100.0%	100.0%
		No	100.0%	0.0%	100.0%
Eldoret	Municipal by- laws regulating UA are enforced strictly in town	No	83.7%	16.3%	100.0%

Table 4.24 indicate that, except for respondents who said Municipal by-laws regulating UA are enforced strictly in Kisumu town, the majority maintained that zoning ordinance permits the cultivation of crops within plots in town in all towns. During an interview with one of the County directors of Planning, it was revealed that the planning department often ensures that some ten

percent (10%) of the total plot size is often left as green space within low-density residential areas.

*"Planning department provides for reservation of up to 10% of the total plot size as green space, especially in low-density residential areas, where flowers, crops, and fruit trees such as avocado, and strawberries may be grown or left for landscaping purposes. However, this is not common in core urban areas with high-density residential areas, (County Director Physical Planning-2)"*

The statement by County Director Physical Planning -2 indicates that planning usually allocates 10% of any planned plot as green space, where urban agriculture may be practiced, although the word "green space" is rarely interpreted or understood to mean a space for practicing urban agriculture. This means urban agriculture is a passive and indirectly planned issue that can only be regarded as a locally Unwanted Land Use (LULUs) or simply a tolerated practice.

**Table 4.25: Awareness of Physical Planning and Land Use Regulations, and Town Planning Department having Urban Agriculture Unit**

Name of town			Town planning department has urban agriculture unit		Total
			Yes	No	
Kisumu	Awareness of physical planning and land use regulations	Yes	3.8%	96.2%	100.0%
		No	17.1%	82.9%	100.0%
Kakamega	Awareness of physical planning and land use regulations	Yes	42.1%	57.9%	100.0%
		No	0.0%	100.0%	100.0%
Eldoret	Awareness of physical planning and land use regulations	Yes	20.5%	79.5%	100.0%

Table 3.25 shows that majority of respondents who were either aware or not aware of physical planning and land use regulations, all maintained that town planning department did not have urban agriculture unit in its administrative structure. This study finds that irrespective of awareness of physical and land use planning regulations, the majority of respondents maintained that town planning department did not have a specific unit dealing with urban agriculture. The

establishment of an urban agriculture unit would be important in facilitating interdepartmental coordination, promotion, and regulation of urban agriculture. Studies (Ramaloo et al,2018, and Montes & Aslan, 2021) assert that one of the strategies for enhancing legal frameworks for urban agriculture include: Provision of a UA office by municipality to deliver UA activities, drafting UA policy document, establishing and executing By-law in favour of UA, and urban agriculture-friendly policies in general plans, among others

In terms of enforcement and compliance with environmental laws, a further interview with one of the town planners revealed that municipal by-laws enforced by the town authorities were sometimes leaning more towards public health and environmental law requirements. An outstanding statement captured by the researcher was:

*Most of the agricultural activities within the town are prohibited, due to public health and environmental reasons, supported by public health and environmental laws. One of the issues necessitating this prohibition is how waste produced from such agricultural activities is managed. For instance, some animals, like pigs are noisy and their wastes emit nauseating odour which often affects the neighbourhood. Furthermore, neighbours renting housing units close to where pigs are kept, will often, complain resulting in landlords or rental plot owners dismissing such a tenant. The same applies partly to large-scale poultry farming (Town planner-2).*

It is emerging from the statement attributed to Town planner-2 that most environmental standards being enforced are also related to waste management, in terms of their collection and safe disposal. Similarly, in the absence of set environmental standards to be met by urban farmers, enforcement seems to be carried out in response to complaints of the neighbours. Apart from Municipal-by-laws or county legislations, The Public Health Act and the National Environmental Management Act (NEMA) are two other key legislations that regulate urban agriculture in towns. Whereas Public Health Act prohibits the growing of tall crops due to security and health reasons, NEMA is more concerned with noise pollution in the environment,

waste disposal from agricultural wastes, and carrying out Environment Impact Assessment(EIA) where major UA projects are to be implemented.

**Table 4.26: Type of Livestock and Penalties for Non-Compliance With UA Regulations**

Name of town			Penalties for non-compliance are fair to UA farmers		Total
			Yes	No	
Kisumu	Type of livestock	Indigenous	67.3%	32.7%	100.0%
		Exotic	0.0%	100.0%	100.0%
Kakamega	Type of livestock	Indigenous	37.5%	62.5%	100.0%
		Exotic	66.7%	33.3%	100.0%
Eldoret	Type of livestock	Both	0.0%	100.0%	100.0%
		Indigenous	0.0%	100.0%	100.0%
		Exotic	13.3%	86.7%	100.0%

Results from Table 4.26 show that except for Kakamega town, respondents who were keeping exotic livestock had a majority asserting that penalties for non-compliance were fair to UA farmers in Kisumu and Eldoret towns. Similarly, except for Kisumu town, respondents who kept indigenous livestock said that penalties for non-compliance were not fair to UA farmers in Kakamega and Eldoret towns. Overall, most people who either keep exotic or indigenous livestock maintained that penalties for non-compliance were not fair to UA farmers in the three towns.

Results from an interview with one planner, also indicate that town administrators tended to use the old Municipal by-laws where there were various penalties (fines), including those for animals found roaming in town. An emerging statement during an interview session was:

*For animals found roaming in town, the options were that they could be impounded or just charged an impounding fee, which the farmer is required to pay on the spot. Generally, the charges range from Kshs. 2000-5000 per animal, depending on how long the animal stays in the impounding yard. Other options for impounded animals that overstayed in the municipal yard included; animals being auctioned or donated to public schools and prisons among others. At the moment, there is no new county legislation to control roaming animals in town; hence the enforcers are using the old municipal by-laws (County Director Physical Planning-3).*

The statement attributed to Planner-3 demonstrates that penalties enforced on urban farmers for non-compliant with regulations in the three towns were harsh and did not encourage urban UA practices. Penalties enforced seemed to be punitive, archaic, and were generally not proactive towards UA activities. It was observed that planning authorities were enforcing the old municipal by-laws despite these laws standing repealed after the promulgation of the constitution 2010 of Kenya. The authorities argue that in the absence of new county legislation enacted by the Municipality, it means a vacuum exists in the law, and therefore they cannot actively enforce the law hence simply resorting to using the old by-laws, environmental (NEMA), and public health laws. However, such repealed municipal bylaws do not have the force of the law and can easily be challenged in a court of law.

During FGD discussion, with sampled farmer group leaders, regarding penalties for non-compliant with regulations, it emerged that the law enforcers were extorting money from offenders of roaming cattle, and, in most cases, incidents of corruption were evident. A statement captured during one discussion was:

*.....whereas the Municipal councils used to charge offenders through "kangaroo courts" (unofficial courts), only Kshs. 200/= per cow per day for cattle found roaming in the street, however, after inception of the devolved system, the charges were raised to 1000/= per day per cow. Interpretation of roaming animals was, however, at the discretion of the enforcement officers, (FGD 3).*

The statement attributed to FGD 3 suggests that the issue of roaming livestock was being arbitrarily applied by enforcement officers of the three towns. It should be noted that, although the urban farmers were complaining of "kangaroo courts"-that is the unofficial courts, this was the practice of charging offenders on spot. However, this process was indeed subject to biases in the interpretation of the law on roaming animals. Again, at the inception of devolution, counties



had to step up their collection of revenue to boost their appropriation in aid hence the observed increased charges. This finding points to the incoherent manner in which regulatory measures were applied in the study town, thereby affecting UA farmers negatively.

Aluko (2011) concurs that planning agencies should be loyal to duty and avoid kickbacks in whatever form they may appear. Akeem, Olutayo, and Theophilus (2018) argued that weak implementation of planning regulations and the lack of political determination has resulted in the poor implementation of planning standards and laws regulating urban improvement. Moreover, planning regulations were partially or not enforced to standard. Similarly, Mubvami & Mushamba (2006) concur that urban planning in most developing countries has tended to be characterized by long-range comprehensive planning, which adopts a blue-print approach, a type of planning associated with rigidity and a lack of responsiveness to social issues, and has negatively affected the integration of urban agriculture. Simiyu and Foeken (2011) agree that urban agriculture in Eldoret town has been restricted and even criminalized. Moreover, Mosha (2016) emphasizes the role of central and local governments in creating an enabling environment for promoting food production.

During another FGD discussion, it emerged that instead of giving tax reductions to encourage urban agriculture, more levies were introduced. This fact was captured in a statement:

*Regarding more taxes, the county government introduced new market levies on selling livestock at the rate of 30/=and 50/= per chicken and Cattle respectively. Law enforcement was mainly executed through arrests, impounding livestock, and involving urban farmers in "kangaroo courts" by town management authorities (FGD 2).*

The statement captured from group discussions (FGD 2) alludes to the fact that the sale of livestock and poultry in the towns, seems to be targeted to generate more taxes for the county government. It is the finding of this study that instead of tax reduction to promote UA activities,

there were punitive taxes on the sale of livestock in the three towns under study. Results from an interview with one of the planners, also indicate that town administrators tended to use the old Municipal by-laws, whereby there were various penalties (fines) including those for animals found roaming in town. Penalties for crops were even more severe as law enforcers were removing or cutting the crops that were considered to have been cultivated in non-compliant zones.

#### 4.6.4 Loglinear Analysis for Variables of Planning legislative framework

The study carried out a further log-linear analysis of a few variables to demonstrate their associations and establish the selected model. The variable on land policy (LP), physical planning and land use law (PL), and municipal by-laws (MB) were used for the demonstration of association and establishment of a log-linear model.

**Table 4.27: Description of Categorical data for Loglinear Model**

Name of Constructs	Symbols of Categorical Variable
Land policy	LP
Physical and land use Planning law	PL
Municipal by-law	MB

##### 4.6.4.1 Model Selection.

**Table 4.28: K-Way and Higher-Order Effects**

	K	Df	Likelihood Ratio		Pearson		Number of Iterations
			Chi-Square	Sig.	Chi-Square	Sig.	
K-way and Higher Order Effects	1	26	110.798	.000	125.211	.000	0
	2	20	31.614	.048	27.907	.112	2
	3	8	13.792	.087	11.961	.153	3
K-way Effects	1	6	79.185	.000	97.304	.000	0
	2	12	17.822	.121	15.945	.194	0
	3	8	13.792	.087	11.961	.153	0

Results from Table 4.28 show that 110.798 tests the significance of all terms of the first order and higher, while 31.614 tests the significance of the second term and higher orders. 13.792 tests

the significance of the third term and higher orders. Since the likelihood ratio chi-square p-value (p=0.000) is less than 0.05, then the first K factor is significant, and the complete independent model needs to be included in the resultant model.

From the top table, 110.798 is the likelihood ratio chi-square of the mean only excluding parameters while 0.000 is the likelihood ratio chi-square for the complete independence model. The difference between 110.798 and 31.614 is 79.185 which weighs the improvement of the model after including the main effects. Since the improvement is related to a p-value = 0.112 which was not significant, the hypothesis that 1<sup>st</sup> K-way and higher order effects do not exist is rejected. When the 2-way effects were included, it also changes the likelihood ratio chi-square by 79.185 with a p-value of .000, implying that it is significant. Since the p-value < .05, the hypothesis that the first (1<sup>st</sup>) order effects do not exist is rejected. Since all the k-ways and higher order, as well as K-ways, have p-values greater than 0.05, they all turn out to be insignificant and are therefore left out in the resultant model.

#### 4.6.4.2 Partial Associations

After testing the significance of the k factors in the K-ways and higher order effects and K-way effects, for purposes of identifying the resultant model, partial associations between the main terms and interaction effects were evaluated. Table 4.29 shows the partial associations among the variables.

**Table 4.29: Partial Associations**

<b>Effect</b>	<b>Df</b>	<b>Partial Chi-Square</b>	<b>Sig.</b>	<b>Number of Iterations</b>
LP*PL	4	3.916	.417	2
LP*MB	4	13.054	.011	2
PP*MB	4	1.677	.795	2
LP	2	19.883	.000	2
PL	2	40.746	.000	2
MB	2	18.555	.000	2

Table 4.29 shows that the main terms which include land policy (LP), Physical planning and land use law (PP), and Municipal by-law (MB) were significant at  $p=0.000$ . Also significant was the 2-way interaction effect of LP\*MB at  $p$  value= $0.011$ . This finding tends to imply that although LP, PL, and MB were critical variables in determining the current socio-economic and environmental status of urban agriculture, there was only one significant 2-way interaction between LP\*MB. However, it was interesting to note that physical planning and land use law, which is one of the main statutes in the spatial planning policy and legal framework, had no significant interaction with land policy and municipal by-laws. This disconnect might have been brought about by low awareness of urban farmers on planning issues as opposed to land policy and municipal by-laws which were affecting their lives daily as farmers. The main factors LP, PL, and MB have significant effects in the model, as well as the interaction LP\*MB. There is no evidence to support the inclusion of the other two-way interactions, as well as the three-way interaction LP\*MB\*PL.

Table 4.30 shows the final model after backward elimination

**Table 4.30: Convergence Information<sup>a</sup>**

Generating Class	Land policy (LP)*Municipal by-law(MB), Physical and land use Planning law
Number of Iterations	0
Max. Difference between Observed and Fitted Marginals	.000
Convergence Criterion	.250

a. Statistics for the final model after Backward Elimination.

The final model after backward elimination was determined by assessing quality of uniform order models which included complete independence model, 2-way interactions (Homogeneous association) model and the 3-way interaction (saturated) model. Where  $p>0.05$ , the model was removed or deleted. Table 4.40 shows that there was an association relationship between Land policy and Municipal by-laws (LP\*MB), and Land Policy and Physical and land use planning

Act (LP\*PL). However, there was no association between the three main terms. This finding tends to imply that there was a disconnect between the land policy, physical planning Act and the current Municipal by-laws, a factor which may imply weak or non-existent facilitation or regulation of urban agriculture in the three study towns.

The 2-way interaction between Land policy and Municipal by-laws (LP\*MB) indicate that the land policy was interacting with the municipal by-laws thereby influencing the operations of urban agriculture in some way. This is particularly true because the land policy, as an overarching statute guiding land use in the country, was expected to be cascaded as county legislations and municipal by-laws. Elsewhere, Table 4.25 in this study indicate that majority of both male and females were not sure whether municipal by-laws regulating UA were being enforced strictly, thus hindering the practice in Kisumu and Eldoret towns, while in Kakamega most respondents of both genders maintained that municipal by-laws regulating UA were not being enforced strictly. In nutshell, the final model after backward elimination was determined by assessing quality of uniform order models which included complete independence model, 2-way interactions (Homogeneous association) model and the 3-way interaction (saturated) model. Table 4.40 shows that there was an association relationship between Land policy and Municipal by-laws (LP\*MB), and Land Policy and Physical and land use planning Act (LP\*PL).

From this finding, it seems that the majority of respondents generally felt that municipal by-laws regulating UA were not being enforced strictly, and even where they were enforced, the enforcement was skewed to public health and environmental law requirements. This implies that there was weak law enforcement and compliance with municipal by-laws within the towns. In light of section 3.4.1.4, on planning for urban agriculture in the Sessional Paper Number 3 of 2009, (Kenya, 2009), there should be an urban agriculture legislative and regulatory mechanism

at the municipality level to facilitate and regulate urban agriculture. The absence of such a mechanism, therefore implies that urban agriculture was operating under ineffective and weak law enforcement and compliance, which did not auger well for planning.

Regarding the homogeneous association revealed between Land Policy and Physical and land use planning Act (LP\*PL) in this study, it suggests that land policy and physical and land use planning are two statutes that are closely intertwined. Elsewhere in Table 4.29 of this study, it was revealed that the majority of respondents who produced eggs, kale, and local vegetables did not agree that the national land policy is supportive of UA. This finding shows that the national land policy was not influencing urban agriculture much, perhaps due to a disconnect between the policy and the physical and land use planning Act. Currently, the physical and land use planning Act does not view urban agriculture as one of the land users, hence does not cater to its operations. However, since the land policy already considers UA as a planning issue, the physical and land use planning Act ought to be reviewed to include it in spatial planning. Therefore, there is need to ensure that the land policy and the physical and land use planning act work in tandem, with regard to urban agriculture.

#### **4.7 Contribution of Planning Strategies, Plans, and Programmes to Urban Agriculture**

The third objective of the study was to analyze the contribution of planning strategies, plans, and programmes to urban agriculture in the three towns in Western Kenya. The main variables under study were: strategies, plans, and programmes related to urban agriculture.

##### **4.7.1 Planning Strategies and Urban Agriculture**

A strategy is a purposeful, design for action or conception preceding action (Mintzberg,1987). In this study, strategy is viewed both as a plan and purposeful action in planning. Redwood (2012)

examined concrete strategies to integrate city farming into the urban landscape and concluded that city farmers, politicians, environmentalists, and regulatory bodies, should work together to improve the long-term sustainability of urban farming as a major, secure source of food and employment for urban populations.

Literature studies show that one of the strategies for the promotion of urban agriculture is the establishment of an urban agriculture unit.

**Table 4.31: Plot Ownership and Urban Agriculture Unit for Farmer’s Service Delivery in Town**

Name of town		Urban Agriculture Unit for Service Delivery to farmers in town			Total
		Yes	No		
Kisumu	Plot ownership	Yes	4.2%	95.8%	100.0%
		No	16.2%	83.8%	100.0%
Kakamega	Plot ownership	Yes	40.0%	60.0%	100.0%
		No	0.0%	100.0%	100.0%
Eldoret	Plot ownership	Yes	20.5%	79.5%	100.0%

Table 4.31 shows that among respondents who owned plots, majority maintained that there was no urban agriculture unit that advises farmers in all three towns. This finding shows that there is no established office to facilitate urban agriculture in all three towns. Studies have shown that there is a need for an urban agriculture office to be established within the town planning department. This view is supported by Ramaloo *et al*, (2018), who identified the provision of a UA office or unit to facilitate delivery of UA activities within the municipality, as a strategic legal focus to propel the development of urban agriculture. Similarly, Krause, Feiock, & Hawkins (2016) observed that administrative structure can shape bureaucratic process, performance, and responsiveness, and is a particularly important consideration when new bureaucratic functions and programs are being established. Based on this, an administrative

structure, represented by an urban agriculture office/unit, would be ideal for improving performance and responsiveness to delivery of urban agriculture activities to urban farmers by the town planning department.

Further investigation on this issue, through an interview with County Director of Agriculture-1, revealed that previously before devolution of agriculture function to the county in the year 2012, there used to be a desk officer in charge of urban agriculture projects in the department of Agriculture. However, such officers were only active during implementation of specific UA projects rolled out by the Ministry of Agriculture, after which, they would revert to normal extension work. This finding tends to imply that urban agriculture has not been properly institutionalized either in the department of Agriculture or planning. During FGD discussions, members of FGD also asserted that there was no urban agriculture office desk either in the department of Agriculture or planning. However, discussants tended to concur that awareness creation and lobbying of policymakers was the best measure for promotion of UA practice. One statement from one FGD member was that:

*Apart from having a proper administrative structure, in form of urban agriculture office, some of the most effective measures of promoting urban agriculture in our town should include; creating awareness and lobbying policymakers as well as developing an urban agriculture policy (FGD-2)*

This finding from FGD-2 calls for a concerted effort to create more awareness, lobby planners and policymakers, and establish better administrative frameworks, in terms of structures and county legislations in the three study towns. Cissé, *et al* (2005) asserts that despite growing interest by public authorities in urban agriculture, there was never a corresponding effective consideration of the practice in the institutional and legal provisions of most West African countries.



Further discussion on the establishment of necessary administrative structures for facilitation of urban agriculture, revealed that the town management board/committees had the mandate to establish relevant guidelines, rules, and structures for facilitation and regulation of urban agriculture in towns. This was highlighted in an interview with Chief Officer-Planning Dept. 2, who asserted that, although there was awareness and interest by planning authorities to set up city/town management boards to provide effective administration of urban agriculture, among other issues, this did not take effect immediately, and even when they were finally established, such guidelines are yet to be developed. This was captured in a statement that:

*“In our town, there was a delay in establishing a city/town board of management, yet such boards are the ones mandated to set up guidelines for the proper practice for administration of urban agriculture (Chief Officer-Planning dept-2)*

The statement attributed to Chief Officer-Planning dept-2 suggests that planning administrative framework in the continuum of UA practice was inadequate because the city/town management board had not been established to set up guidelines or rules for the practice. Although the boards were later set up, the specific legislative framework for facilitation and regulation of UA is yet to be set up in these three study towns. The delay in appointment of the boards and establishment of a legislative framework for UA was in contravention to the aspirations of statutory guidelines in the country.

For instance, Kenya (2010) sec.184 (1) stipulates that the national legislation shall provide for the governance and management of urban areas and cities and shall, in particular, establish the principles of governance and management of urban areas and cities, and provide for participation by residents in the governance of urban areas and cities. Also, Urban Areas and Cities Act (UACA) 2012 provides for the establishment of city/town boards of management to ensure the integration of urban agriculture into urban planning by having a regulatory mechanism for the

practice. In addition, The Sessional paper no. 3 of 2009 on land policy, Sec. 110, states that urban agriculture has not been properly regulated and facilitated while Sec 111(b) provides for putting in place an appropriate legal framework to facilitate and regulate urban agriculture. (Kenya, 2010, Kenya, 2012 and Kenya 2009) However, there is contrasting evidence that suggests that institutional structures alone may not be sufficient in enhancing the performance of development activities, such as setting up an urban agriculture unit (Ramaloo *et al*, 2018 Krause, Feiock, & Hawkins, 2016). Nchanji (2017) cautions that informal governance arrangements are widespread but neither informal nor formal systems are always successful in resolving governance issues. Similarly, Udayaadithya and Gurtoo (2014) concur that the creation of formal democratic institutional channels, or better institutions alone, does not automatically play a role in governance performance, but this relationship is mediated by the economically and politically powerful stakeholders. Quick et al (2016) also concurs that governance encompasses formal and informal processes of decision-making and management of domains of collective community interest or concern. Moreover, Marsden and Groer (2016) assert that "better" structures are not sufficient to achieve the implementation of more effective policies and that although institutional structures must matter, it is the broader governance environment, resources, and politics that seem to dominate the implementation of policy.

This study concludes that whereas the establishment of an urban agriculture unit would be ideal for reducing conflict and improving planning as well as interdepartmental coordination, more special attention should be given to public participation by urban farmers to realize any success.

One of the documented strategies for the inclusion of urban agriculture into urban planning is the implementation of urban agriculture as a beautification and landscaping strategy. The

researcher, therefore, enquired about the use of rooftop and window gardening as a strategy for beautification in towns.

**Table 4.32: Gender and Rooftop and Window Gardening for town beautification**

Name of town			Rooftop and window gardening as a way of beautification			Total
			Yes	No	Not sure	
Kisumu	Gender	Male	33.3%	38.1%	28.6%	100.0%
		Female	20.0%	35.0%	45.0%	100.0%
Kakamega	Gender	Male	17.1%	26.8%	56.1%	100.0%
		Female	15.8%	42.1%	42.1%	100.0%
Eldoret	Gender	Male	42.1%	44.7%	13.2%	100.0%
		Female	33.3%	47.6%	19.0%	100.0%

Table 4.32 shows that males affirmed that rooftop and window gardening was used as a way of beautification in towns in Kisumu and Eldoret towns, while females did not affirm in Kakamega and Eldoret towns. This implies that the awareness level of both males and females on the use of window gardening as a strategy for town beautification was not the same. Overall, majority did not affirm or were not sure that rooftop and window gardening was used as a way of beautification in towns.

This finding contrasts with results revealed in earlier studies, especially studies in developed countries. In Germany, a study by Artmann and Sartison (2018) showed that urban agriculture contributes to; climate change through the creation of microclimate in towns, food security, biodiversity and ecosystem services, agricultural intensification, resource efficiency, urban renewal and regeneration, land management, public health, social cohesion, and economic growth. Similarly, a study done in Lisbon by Grilo et al (2016) showed that the great majority of urban farmers cultivated crops for leisure and environmental beautification, and highlighted the importance of being outdoors. Abera, Tadesse, and Belayneh (2017) also concur that UA plays a decisive role in generating household income, serving as employment opportunities, contributing to food supply, economic use of land and environmental enhancement, beautification of the town

and solid waste management are the major roles of urban agriculture in the area. Accordingly, town planning authorities ought to consider the use of urban agriculture as a beautification or landscaping strategy to incorporate it into urban planning. Allocation of specific zones for development activity, such as urban agriculture, in the spatial planning of each town is always intended to reduce conflicts between development stakeholders on land use. The respondents were, therefore, requested to indicate whether specific zones for UA were zones secluded for UA within estates and residential building Plans. Table 4.33 presents the distribution according to plot ownership and Zones for UA in plans of residential buildings in the three towns.

**Table 4.33: Plot ownership and Plans of estates and residential buildings with special zones/spaces for gardening**

Name of town			Plans of estates and residential buildings have special zones/spaces for gardening			Total
			Yes	No	Not sure	
Kisumu	Plot ownership	Yes	54.2%	41.7%	4.2%	100.0%
		No	0.0%	44.4%	55.6%	100.0%
Kakamega	Plot ownership	Yes	18.9%	56.6%	24.5%	100.0%
		No	100.0%	0.0%	0.0%	100.0%
Eldoret	Plot ownership	Yes	49.2%	27.9%	23.0%	100.0%

Table 4.33 shows that most respondents who owned plots maintained that plans of estates and residential buildings have special zones/spaces for gardening in Kisumu and Eldoret towns. Those who did not own plots had majority who were not sure in Kisumu while in Kakamega respondents asserted that plans of estates and residential buildings did not have special zones/spaces for gardening. This finding shows that UA was given some special preference by the planning department, during land allocation in spatial planning or drawing plot plans for estates and residential buildings. This finding concurs with practices carried out by planners in developed countries where UA is fully recognized and integrated into spatial plans of major cities such Berlin, New York, and Oslo. In these towns, urban planners have used urban agriculture as a strategy for the development of sustainable cities over the years, in areas such as

urban landscaping, biodiversity conservation, and long-term city planning and investments. A study by Freisinger et al (2015) in Berlin found that urban agriculture was supported by the local political authorities and explicitly promoted as a strategy for the city's sustainable development. It had been connected to general urban planning strategies and was being implemented into larger urban programs. This accounted for all types of urban agriculture from ground-based community gardens to commercial rooftop greenhouses. Similarly, Horst, et al (2017) concluded that planners should more explicitly orient their urban agriculture efforts by prioritizing urban agriculture in long-term planning efforts, and by targeting city investments in urban agriculture in the USA. This study, therefore, brings to the forefront an argument that the use of urban agriculture for urban landscaping, beautification, biodiversity conservation, and long-term city planning and investments are some of the possible strategies planners could employ to integrate urban agriculture in the three study towns.

**Table 4.34: Main crop grown and Gardening in open spaces or road reserves in Town**

Name of town			Gardening in open spaces or road reserves in town		Total
			Yes	No	
Kisumu	Main crop grown	Vegetables(tomatoes, kales, local veges, onions)	6.2%	93.8%	100.0%
		Cereals(maize, sorghum)	0.0%	100.0%	100.0%
Kakamega	Main crop grown	Vegetables(tomatoes, kales, local veges, onions)	100.0%	0.0%	100.0%
		Cereals(maize, sorghum)	9.6%	90.4%	100.0%
Eldoret	Main crop grown	Vegetables(tomatoes, kales, local veges, onions)	27.5%	72.5%	100.0%
		Cereals(maize, sorghum)	100.0%	0.0%	100.0%

Table 4.34 shows that majority of vegetable growers were not gardening in open spaces or road reserves in Kisumu and Eldoret towns but not so in Kakamega town. Also, the majority of cereal growers were not gardening in open spaces or road reserves in Kisumu and Kakamega town but not so in Eldoret. This finding shows among vegetable growers, except for Kakamega town, majority of respondents maintained that gardening in open spaces or road reserves was not taking place in Kisumu and Eldoret towns. Similarly, among cereal growers, except for Eldoret town, majority did not carry out gardening in open spaces or road reserves in Kisumu and Kakamega towns.

The physical and land use planning regulations No. 13 allows for the growing of vegetables in town, which means urban farmers in Kakamega were simply compliant with the law, while those in Kisumu and Eldoret had a possibility of growing vegetables within open spaces or road reserves. On the other hand, cereal growing, being a tall crop is prohibited in town and therefore the growing of cereals in Eldoret was a breach of the law but a compliance issue in Kisumu and Kakamega. This finding shows that majority of respondents had not been undertaking gardening in open spaces or road reserves in the study towns. However, urban farmers have an opportunity to liaise with planners and town management authorities to allow them to garden in open spaces and road reserves, so long as this is done under strict laws and regulations such as the Physical and land use planning regulations.

It seems the use of open spaces or road reserves for farming is an option, which is being used by urban farmers elsewhere but hardly exploited or explored by urban farmers. Khalilnezhad (2016) concurs that although UA is not a new concept in Iran since urban green spaces have been maintained and even expanded in the past, the implementation of UA as a solution for urban sustainability has not yet received sufficient attention. Similarly, Slade and Baldwin (2016)

assert that using zoning ordinances can be used to permit UA in existing open space. In another interview with planners, it became clear that the use of open spaces is largely restricted by town authorities. The open spaces include lands between roads, public parks, and regions along the road reserves. An outstanding statement from Planner illustrates this:

*No, there are no reservations of open zones for UA. Planners only reserve recreation areas and ecologically fragile areas, especially in Local physical and land use development Plans or county spatial plans, but not UA areas (County Director of Physical Planning-3).*

Based on the statement attributed to the Director of Physical Planning 3, it is emerging that there are no specific plans which isolation of some open spaces for urban agriculture. However, built up environment are often prioritized and take centre stage in planning of urban areas. Studies have shown that planning can be highly instrumental in the regulation of UA through legitimization and institutionalization of UA by facilitating multi-stakeholder processes, policy development, and, conservation and allocation of land (Halloran & Magid, 2013). Apart from allocation of land for urban agriculture, planning administration can be used to zone or permit UA in existing open space (Baldwin, 2016). Planning can also be used for : facilitating UA as a choice architecture by creating many features (choices) through use of UA in their environment, integrating food and UA into comprehensive plans and frameworks, establishing appropriate zoning and regulation, as well as creating an agriculture unit in the municipal planning department (Khalilnezhad,2016). It can therefore be deduced that planning existing in the three towns does not facilitate UA in all its multiple roles (social, economic, and environmental). Modern planning trends show that compact planning strategies are continuously being adopted in modern sustainable cities. Further interviews with planners revealed that currently, planning revolves around creating compact towns with high-density residential areas, which do not allow space for UA. This view was reflected in a statement:

*UA has often been bedeviled by lack of attention from planners and not being actively planned for as a land user. Elsewhere in countries like Korea and China, UA has been embraced by planning authorities and is practiced on places like island road reserves etc. Incidentally, in Kenya, when you talk to people in rural areas where urban area is expanding, they fear that they will stop farming once the area becomes an urban area, since people may start viewing it as a locally Unwanted Land Use (LULUs). However, that may not necessarily be so, since they can still adopt modern farming that is in tandem with town planning requirements (Town Planner 3).*

It can be deduced from the response of sampled planner-3 that for UA to continue, planning in Kenya ought to undergo a paradigm shift in its focus and approach to planning, to give proper attention to UA. Currently, urban agriculture is either passively or not just planned for at all. Elsewhere, in countries like Korea and China, planners are actively planning for UA. In Kenya, UA is well grounded in the national legislations, such as the Urban Areas and Cities Act 2012 sec (20, 36 & 40), but lacks specific county legislation to guide it, hence is often considered a supportive, complementary land use or simply a locally unwanted land use (LULU) rather than a stand-alone user. Seemingly, the perception of planners is that UA is a rural-urban interface issue that belongs more to the rural than to urban areas. From a planning perspective, UA cannot be practiced as ordinary extensive farming, due to limited urban land sizes as well as for health and security reasons.

Another disturbing issue for planners is the decision on where to allocate land for urban agriculture, due to its competition with other land uses. An interview with one planner revealed that due to increased urbanization, agricultural land is being reduced as a result of continuous subdivisions of freehold land and change of user arrangements. A statement from the planner was:

*“The way people practice UA mimics the pattern demonstrated by the Von Thunen model. There is a leasehold area which is within town centre and freehold area where urban expansion is taking place. Within that freehold area, local people are already doing land subdivisions for urban activities. This has impacted the UA since many of the landowners prefer to sell because of the high demand. Most*



*landowners have not been able to utilize their land productively. However, even when they sell the land, they do not re-invest in the little land remaining for agricultural purposes. Sometimes, the land is just left idle or simply rented out to people who use it for agriculture purposes" (Town Planner-1)*

The statement from Town Planner 1 suggests that the practice of urban agriculture in towns appears to mimic the Von Thunen theory, whereby land is rented to a competitive user depending on the market value for money. Most land owners in freehold areas often sell their land to get the highest rent or value for the land. Moreover, there are fewer UA activities in urban core areas such as the Central Business District (CBD) but agricultural activities increase as one goes to the periphery or urban fringes. However, despite this argument by the planner-1, The Von Thunen model of agricultural land use is one of the oldest land use models explaining land use in cities. However, it does not appear to provide sufficient explanation for contemporary urban agriculture. Urban agriculture does not necessarily offer the highest or best use of land compared to other land uses. The model was created by a farmer and amateur economist J.H. Von Thunen in 1826.

The model was based on assumptions that: the city is located centrally within an "isolated state" which is self-sufficient and has no external influences; the isolated state is surrounded by an unoccupied wilderness; the land of the isolated state is completely flat and has no rivers or mountains to interrupt the terrain; soil quality and climate are consistent throughout the state; farmers in the isolated state transport their goods to market via oxcart across the land directly to the central city; there are no roads; and farmers act to maximize profits (Malamis et al, 2016).

The Von Thunen model hypothesized that a pattern of four rings often develops around the city, with the first ring occupied by intensive farming and dairying, the second covered by forests to provide timber and firewood for fuel and building materials, third having increasing extensive

field crops and the fourth concentric ring having ranching and animal products. The model predicts the development of a city in terms of land use, with most productive activities located closer to the central market (Central Business District) and less productive activities far away. The relative cost for transport of agricultural products determines the use of agricultural land around the city (Malamis *et al*, 2016).

Consequently, the first concentric ring closest to the CBD would be occupied by intensive farming and dairying, which is more productive, while the fourth ring would have ranching and animal products since these are not so productive and hence located far away from the CBD. However, the major drawback is that the model does not consider differences in local, physical conditions since it has been developed in an isolated state (Malamis *et al*, 2016). It is imperative to note that land is a crucial factor of production in urban agriculture and therefore has been at the centre of most studies, with loss of agricultural land due to urban expansion and land shortage for urban agriculture being the main constraints facing urban agriculture. The finding on the loss of agricultural land due to urban expansion is one of the main constraints in urban agriculture. Erickson, Lovell & Méndez (2013) concur that agricultural land was continuously being lost to other land uses such as residential and commercial land uses. Also, Tugwell (2012) asserts that the availability of land is a significant determinant of UA practice in Zimbabwe, while Abera, Tadesse & Belayneh (2017) highlighted the land granting system as one of the main challenges facing UA practice in Ethiopia. This study, therefore, argues that urban expansion in the study towns is fueling the loss of agricultural land to other land uses, particularly residential and commercial land uses, hence planners ought to consider the integration of urban agriculture into land use planning strategies, as an innovative approach for

food production, as well as countering effects of urban expansion and loss of agricultural land to other land uses.

#### 4.7.2 Plans, Programmes, and Urban Agriculture

Plans are statutory and multi-topic policy statements for a subarea, which are backed with legislation, while programmes are non-statutory, single-topic statements for whole areas (Solesbury, 2013). Thus, strategy, plans, and programmes are interlinked and are all important in executing a particular policy. Plans, programmes, and legislations can be introduced to institutionalize urban agriculture, reduce the contamination of wastes, modify agricultural practices, and educate cultivators (Oladele, Olufunke, and Adeoti,2012). The primary purposes of a program are to carry out the strategy of the structure plan, state specific policies for the programme area, act as a link with resource management, conduct medium-term financial and manpower planning, and prepare the annual budget. In contrast, the purpose of a plan is to carry out the strategy of the structure plan, state specific local policies, and inform the public about local issues and policies (Solesbury, 2013).

**Table 4.35: Capacity building on Agriculture or Planning issue and Main support/facilitation or services Received for UA activities**

Name of town			Main support / facilitation or services received for UA activities				Total
			Livestock department	Agriculture department	Farmer to farmer	Planning department	
Kisumu	capacity building on agriculture or planning issue	Yes	67.9%	28.6%	1.8%	1.8%	100.0%
		No	63.6%	27.3%	0.0%	9.1%	100.0%
Kakamega	capacity building on agriculture or planning issue	Yes	39.1%	21.7%	30.4%	8.7%	100.0%
		No	48.6%	16.2%	35.1%	0.0%	100.0%
Eldoret	capacity building on agriculture or planning issue	Yes	24.6%	55.1%	5.8%	14.5%	100.0%
		No	25.0%	12.5%	50.0%	12.5%	100.0%

Table 4.35 show that among those respondents who had been capacity built on Agriculture or planning issue, most of the respondents maintained that they mainly received support or facilitation from livestock department both in Kisumu and Kakamega towns, while those in Eldoret received support mainly from the Department of Agriculture. On the other hand, those who had not been capacity built on agriculture or planning had most of the respondents asserting that they had all received support or facilitation from livestock departments in all three study towns. The little support or services that were received from the department of planning was mainly during land subdivision. This finding implies that most of the support for UA activities was received from either department of livestock or agriculture, with only little support coming from the planning department.

Further interviews with FGDs in the field revealed that the department of Agriculture was directly supporting urban farmers. For instance, urban farmers reported that sometimes the county government, through the department of Agriculture usually gives them some minimal support, in form of extension services and farm inputs. Figure 4.5 shows farmers receiving support from the county government, in form of agrochemicals for spraying vegetables, dairy cows, and goats. It appears that although UA is not supported by the planning department, the county government through the department of Agriculture was supporting urban farmers irrespective of whether they were urban or rural based.



**Figure 4.5: A farmer receiving agro-chemicals for spraying vegetables from an Agriculture Extension officer & the researcher holding a dairy goat buck that was given to a group by the county government**

The finding that county governments were supporting urban farmers shows that despite the absence of a specific urban agriculture policy or strategy, the practice still receives agricultural extension services from the county department of agriculture. This finding contrasts with studies from developed countries, where UA is highly supported by political structures as well as legal instruments. Freisinger et al. (2015) assert that in Berlin, urban agriculture is supported by the local political authorities and explicitly promoted as a strategy for the cities' sustainable development, and is connected to general urban planning strategies as well as implemented into larger urban programs. Similarly, Artmann and Sartison (2018) assert that UA is supported due to its multifunctionality value in providing social, economic, and environmental co-benefits and ecosystem services, besides contributing to solving ten key societal challenges of urbanization: climate change, food security, biodiversity, and ecosystem services, agricultural intensification, resource efficiency, urban renewal and regeneration, land management, public health, social cohesion, and economic growth. However, in some developing countries, scholars have reported a lack of supportive policy to ground UA practices. For instance, a study done in Iran by

Khalilnezhad (2016) revealed that concerted efforts have not yet been made by planners and policy-makers to develop a UA strategy in the country. Based on the foregoing discussion, it is evident that there are programmes that support urban agriculture since the county government, through the County Department of Agriculture, often supports farmers with agro-chemicals, seeds, and livestock breeding stock such as dairy cows, day-old chicks, and dairy goats.

The study conducted also interviewed county Directors of Planning as well as those of Agriculture in the three towns, with regard to plans and programmes that were being developed and implemented in their respective directorates. From a planning point of view, the main plans, strategies, and programmes undertaken by planning mainly include: County Integrated Development Plan (CIDP), Integrated Development Plan (IDEP), Integrated Strategic Urban Development Plan (ISUDP), Local Physical and Land Use Development Plans (LPLUDPs), County spatial Plan, Municipal spatial plan, Master plan among others. However, master plans are usually rare and take long before they can be reviewed. The following is a summary of the kind of plans and programmes that relate to urban agriculture and planning.

County Integrated Development Plan (CIDP) is a plan prepared by a county to guide development over five years. The Public Finance Management Act, 2012 provides that no public funds shall be appropriated outside a county's planning framework. The CIDP, therefore, contains information on development priorities that inform the annual budget process, particularly the preparation of annual development plans (ADP), the annual county fiscal strategy papers, and the annual budget estimates. It is a super plan that provides an overall framework for development to coordinate the work of both levels of the government in a coherent plan to improve the quality of life for all the people. . The county governments Act of 2012, under section 108, CIDP outlines the county development goals covering five years. The

County Governments Act, 2012 (CGA), 104 obligates a county to develop an integrated plan, designate planning units at all county administrative levels and promote public participation and engagement by non-state actors in the planning process. The County Integrated Development Plan (CIDP) is a 5-year plan that shall inform: The county's annual budget; County Sectoral Plan (10-year plan); County Spatial Plan is a 10-year plan using the Geographic Information System (GIS), and City and municipal plans. It will contain information on investments, projects, development initiatives, maps, statistics, and a resource mobilization framework.

The integrated Strategic Urban Development (ISUD) plan is another key plan which aims at providing a framework for future growth and development of the Municipal over the next 10 to 20 years and is often used as a budgeting and management tool by the Municipal's administration. This study sampled the Integrated Strategic Urban Development Plan (ISUDP, 2017-2037) for Kakamega Town. ISUDP usually involves a participatory process covering nine key areas namely: an introduction, development concept, municipal profile, and projections, structure plan, strategic sector plans, action area plans, development controls and zoning regulations, implementation plan, and a plan for monitoring and review. within the (ISUDP,2017-2037) agricultural zone activities allowed in agricultural zones in buildings or premises shall be normally permitted only for the following purposes: all agriculture uses, farm-house, building for agricultural activities subject, dairy and cattle farms, fish farms, poultry farms, stud farms, forestry, storing and drying of fertilizers incidental to the agricultural activities, and petrol pumps.

However, the ISUDP plan has a special focus on urban agriculture and proposes that the tracts of land between the nodes and the urban core be preserved as areas for urban agriculture. Proposals include intensive, mechanized production systems of fruits and vegetables to feed the proposed

agro-processing industries in the Municipal (ISUDP, 2017-2037). The plan mentions promoting urban agriculture through the development of water harvesting technologies, the promotion of organic manure and high yield seeds, the investigation of damming surface runoff for irrigation, soil conservation and soil fertility, the establishment of an agriculture incubation center at Masinde Muliro University of Science and Technology, and the establishment of county funding for agricultural-based activities (Kenya, 2017)

Apart from the ISUDP, the Annual Development Plan (ADP) is a document prepared as a requirement under Section 126 of the Public Finance Management Act, 2012. The section requires the County government to prepare a development plan under Article 220(2) of the Constitution of Kenya (COK) and submit the plan to County Assembly not later than 1st September of each year for approval, then publish and publicize it within seven days after submission. The FY 2022/2023 ADP articulates the County's strategic priorities within the medium-term expenditure framework (MTEF), reflecting the county government's priorities and plans, programmes, and projects. Specifically, the Plan presents the programmes and projects to be delivered by departments, a description of capital projects, and resource allocation.

The Annual Development Plan (ADP) draws from the CIDP (2018-2022), with the implementation of programs and projects therein seeking to achieve the County goals in the following ways: to achieve food security and improve the nutritional status of residents; to reduce poverty and increase incomes among residents; to improve health and well-being of residents; to improve access to clean and portable water; to attain a sustainable environment; to establish a sustainable, secure, compliant, and reliable infrastructure. According to ADP for Uashin Gishu, the objective of the department of crops in Uashin Gishu had an objective of increasing agricultural productivity, with the expected outcome of increased production and



productivity. To achieve these objectives, the department rolled out five key programmes postharvest management services, crop pest, and disease control services, crop diversification, value added services, empowerment programmes, and extension services. On the other hand, the department of Livestock production had programmes on livestock production services (Kenya, 2022). Analysis of the ADP 2021-2022 for Uashin Gishu shows that many crop and livestock production programmes being implemented by the two directorates of crops and Livestock. This study reveals that there was no single mention of the term "urban agriculture" either as a programme or a project. Given that agricultural extension services usually covered all administrative units such as the county, subcounty, wards, and villages, where there are farmers, this study concludes that urban agriculture is part and parcel of normal agricultural extension in towns although without any defined specific framework. Another important plan is the Local Physical and Land Use Development Plans (LPLUDPs). PLUPA 2019 under section 7 outlines nine (9) land use zones which include: Housing, industry, education, public infrastructure & utilities, transport, agriculture, and recreation, conservation, preservation, and open spaces. All these land use zonations are cascaded into the Local physical and land use Development Plan (LPLUDP). The LPLUDPs outline nine (9) land use categories in various parts of an urban area namely; commercial zone, industrial zone, residential zones with various densities, educational zone, public purpose zone, public utility zone, recreation, transportation, and conservation zone- which was initially known as agricultural zones, (UN-Habitat, 2018, Kenya, 2019). Among these land use categories, the ones that can somehow integrate urban agriculture include; residential, educational, public purpose, and transportation. On the other hand, the IDP plan is an important plan for every municipality as it is useful in resource mobilization. Other critical plans include the Integrated Strategic Urban Development Plan (ISUDP) and the County Spatial Plan.

### 4.7.3 Public Participation and Urban Agriculture

The study further investigated public participation as a tool for programmes implementation. Public participation forms a significant component of engaging stakeholders in every development activity, including urban agriculture. Public participation resonates with the aspirations of the General Systems theory which articulates the importance of interaction between systems forming a whole being. Each small system in the interaction has a contribution to make in making the bigger system fully operational. The respondents were, therefore, requested to indicate whether they participate in the review of town plans based on education and sensitization. Nchanji (2017) also cautions that participatory governance does not always seem possible due to actors' divergent interests.

**Table 4.36: Number of Years of Residence, and Public Participation during Development & Review of City/Town Plans**

Name of town			Public participation during the development & review of city/town plans		Total
			Yes	No	
Kisumu	No. of years's of practice	Below 1 yr	17.6%	82.4%	100.0%
		2-5 yrs	51.7%	48.3%	100.0%
		6-10 yrs	0.0%	100.0%	100.0%
Kakamega	No. of years's of practice	Below 1 yr	100.0%	0.0%	100.0%
		2-5 yrs	100.0%	0.0%	100.0%
		6-10 yrs	23.5%	76.5%	100.0%
		Above 10 yrs	29.0%	71.0%	100.0%
Eldoret	No. of years's of practice	Below 1 yr	0.0%	100.0%	100.0%
		2-5 yrs	39.3%	60.7%	100.0%

Table 4.36 indicates that those who had practiced for below 1 year, except for Kakamega town, majority maintained they were not involved in public participation during the development and review of city /town plans in Kisumu and Eldoret towns. Similarly, except for Eldoret town, majority of respondents who had practiced for 2-5 years maintained there they were not involved in public participation during development and review of city/town plans in Kisumu and

Kakamega towns. Except for Eldoret town, those who had practiced for between 6-10 years maintained that they were not involved in public participation during development and review of city/town plans in Kisumu and Kakamega towns. Similarly, those who had practiced for above 10 years, who were only found in Kakamega, maintained that they were not involved in public participation during development and review of city/town plans. In general, irrespective of the number of years of practice and with exception of a few respondents in Eldoret and Kakamega, majority of urban farmers maintained they were not involved during public participation on development of city/town plans.

This finding shows that except for a few farmers who were involved in public participation, majority of urban farmers were not involved in public participation during development of city/town plans. The lack or low involvement in public participation of urban farmers points to the framing and design of the physical and land use planning Act(PLUPA) No. 13 of 2019, which does not mention urban farmers as one of its stakeholders in planning. This deficiency in the wording of PLUPA means that planners cannot specifically target urban farmers to be involved in public participation, a situation that ends up excluding urban farmers from urban development activities. Also, the lack or low participation in the review of town plans points to limited interactions between urban farmers and the planning authorities. It can therefore be deduced that a disconnect exists with regards to the needs of the urban farmers on one hand and development, review, and implementation of urban plans. The foregoing finding contrasts with the aspirations of the General Systems Theory that interactions are the centre of relationships that lead to sustained behaviour of a single autonomous element, and this is different from its behaviour when the element interacts with other elements (Drack & Pouvreau, 2015). Also, Ismail & Said (2015) assert that community participation needs should be underpinned by a

philosophy that emphasizes empowerment, equity, trust, and learning and that the quality of decisions made through community participation is strongly reliant on the nature of the process leading to them. Similarly, Rowe & Frewer (2004) argue that public participation is better understood through a framework that considers three important mechanisms of participation namely; who participates, how participants communicate with one another and make decisions together, and how discussions are linked with policy or public action. The lack of involvement of urban farmers in public participation can be traced to the powers given to the county planning authority to identify key stakeholders, their interests and potential impacts. PLUPA 2019 states in Article 9 section (1) that "to ensure effective participation by stakeholders, the county planning authority shall identify key.

Since there is no defined structure for involvement, the interpretation of what is considered "key stakeholder", "interests" and "potential impacts" is at the discretion of the authority. The lack of involvement of urban farmers in public participation in the development and review of city/town plans can therefore imply that urban farmers are not considered "key stakeholders" by the county planning authority, and their "interest" and "potential impacts" are less important in development and review of city/town plans. Eckerd & Heidelberg (2020) maintain that public participation is managed by public administrators; who determine the extent of participation, shape the ways that the participation takes place, and decide whether or not participation is valuable for their work. In some cases, the process is rather democratic, whereas, in others, it is not. Also, it is up to administrators to shape the spaces for participation and select the participants in a manner consistent with their understanding of the task to be accomplished.

Interviews with planners, further confirmed that urban farmers have not been specifically targeted, and hence there is a huge gap since their voices have been missing. This is particularly

so, because UA is not considered a land use category in planning, and therefore there has been no deliberate and proactive intervention to get their views. One planner summarized this as follows;

*During public participation, Some stakeholders usually ask where industries will be built, but these are people looking for employment. Sometimes, planners talk to agricultural officers, and fisheries officers but hold no particular forum with urban farmers. So, there is a huge gap in that urban farmers' voices are not isolated, and neither are their issues singled out in plans because there is no deliberate and proactive intervention to get their views. Sometimes when they voice their issues, they are told those are retrogressive practices, we are moving on, the Dubai way. Indeed, we have failed urban farmers (Planner 2).*

The statement from Planner 2 implies that the voices of urban farmers are generally missing in planning since there is no deliberate effort to identify and isolate their issues during planning. Urban agriculture is considered retrogressive and not modern, hence the use of the analogy " the Dubai way". It seems there is a lack of inclusion of urban farmers by planning authorities despite Physical and Land Use Planning (PLUP) regulations giving them powers to identify stakeholders for public participation. The PLUP regulations, under section 9 stipulates that to ensure effective participation of stakeholders, the county planning authority shall identify key stakeholders, and their interest and assess their potential impact of the county plan on the Stakeholders (Kenya, 2019).

Furthermore, it emerged from the interviews with the County Director of Physical Planning-2 that UA practitioners have not had the opportunity to provide their opinions regarding the suitability of the plans or instruments. An outstanding statement obtained by the researcher was:

*I am afraid we have let them down. We have not involved them as urban farmers. Even when holding stakeholder meetings, no one seeks to find urban farmers. Among stakeholders, there are usually urban farmers but no one ever tries to find out exactly what urban farmers want. We just talk to them in the crowd but no one seeks to find what they think. In public participation, stakeholders usually ask where centres for value addition will be and this ends up in plans (County Director of Physical Planning-2)*

The statement obtained from the County Director of Physical Planning-2 suggests that there is inadequate participation of urban farmers during formulation and implementation of town plans. According to this statement, it can be deduced that the lack of active participation of urban farmers during the evaluation and reviews of implementation of town plans denies the planners the opportunity to obtain good feedback capable of enhancing planning. According to Kenya (2020), the CECM for the planning department has powers to include or exclude views from public participation. The Physical and Land use planning (PLUP) regulations under section 10 on review of comments from public participation state that, the County Executive Committee Member (CECM) may wholly, partially, or dismiss altogether the comments or representations from the public participation. This law vests all the powers on CECM to incorporate or disregards comments from public participation, implying that views of urban farmers can easily be dismissed should there be no lobby agencies, such as urban farmer associations, to persuade CECM (Kenya, 2020). The lack of inclusive participation of the players is worrying and seems to breach the tenets of the General Systems Theory as espoused by Bertalanffy (1956). This theory focuses on interactions as the centre of relationships that lead to sustained behaviour of a single autonomous element which is different from its behaviour when the element interacts with other elements (Drack & Pouvreau, 2015).

#### **4.7.4 Loglinear Analysis for variables of Planning Administration**

The study carried out a further log-linear analysis of three variables of planning administration namely; gardening in open spaces or road reserves, public participation on development & review of city/town plans, and town planning department having a unit dealing with urban agriculture, to ascertain associations and log-linear models.

**Table 4.37: Description of Categorical data for Loglinear Model**

Name of Constructs	Symbols of Categorical variable
Gardening in Open spaces or road reserves	GO
Public participation on development & review of city/town plans	PP
Town planning department having a unit dealing with Urban agriculture	TU

#### 4.7.4.1 Model Selection

**Table 4.38: K-Way and Higher-Order Effects**

	K	Df	Likelihood Ratio		Pearson		Number of Iterations
			Chi-Square	Sig.	Chi-Square	Sig.	
K-way and Higher Order Effects <sup>a</sup>	1	7	43.450	.000	45.596	.000	0
	2	4	20.336	.000	21.511	.000	2
	3	1	2.559	.110	1.742	.187	3
K-way Effects <sup>b</sup>	1	3	23.114	.000	24.085	.000	0
	2	3	17.777	.000	19.769	.000	0
	3	1	2.559	.110	1.742	.187	0

a. Tests that k-way and higher order effects are zero.

b. Tests that k-way effects are zero.

Table 4.38 presents the K-way and higher order effects of the main terms which include Gardening in Open spaces or road reserves (GO), public participation in development & review of city/town plans(PP), town planning department having a unit dealing with Urban agriculture (TU) and their interaction effects. Results show that 43.450 tests the significance of all terms of the first order and higher effects, while 20.336 tests the significance of the second term and higher order effects. 2.559 tests the significance of the third term and higher order effects. Since the likelihood ratio chi-square p-value ( $p=0.000$ ) is less than 0.05, then the first k factor is significant and is considered for inclusion in the resultant model.

Looking at the first table of K-way and higher order effects, 43.450 is the likelihood ratio chi-square of the mean only excluding parameters, while 0.000 is the likelihood ratio chi-square for

the complete independence model. The difference between 43.450 and 20.336 is 23.114 which weighs the improvement of the model after including the main effects. Since the improvement is related with a p-value = 0.000 which was significant, the hypothesis that the 1<sup>st</sup> K-way main term effect does not exist is rejected.

The inclusion of 2-way effects, also changes the likelihood ratio chi-square by 23.114 with a p-value of .000, implying that it is significant. Since the p-value < .05, the hypothesis that the first (1<sup>st</sup>) order effects do not exist is rejected. Similarly, since the second (2<sup>nd</sup>) K-way main term has a p-value = 0.000, the hypothesis that the 2<sup>nd</sup> k-way main effect does not exist is rejected, hence the second term also exists and should be included in the resultant model. However, the p-value for the 3 k factor in the K-way and higher order (p=0.187) and third main term (p=0.187) are all not significant (p= 0.187) hence should be left out of the final model.

#### 4.7.4.2 Partial Associations

Table 4.27 shows the partial associations between Gardening in Open spaces or road reserves (GO), public participation during development and review of city/town plans (PP), town planning department having a unit dealing with Urban agriculture (TU).

**Table 4.39: Partial Associations**

<b>Effect</b>	<b>Df</b>	<b>Partial Chi-Square</b>	<b>Sig.</b>	<b>Number of Iterations</b>
GO*PP	1	11.986	.001	2
GO*TU	1	.687	.407	2
PP*TU	1	1.452	.228	2
GO	1	5.148	.023	2
PP	1	.158	.691	2
TU	1	17.808	.000	2

Results from Table 4.39 shows that the only main terms and interaction effects that were significant were town planning department having a unit dealing with urban agriculture (TU) and



interaction effects between gardening in open spaces or road reserves (GO) and public participation during development & review of city/town plans (PP) (GO\*PP) all having a p-value of 0.000. The rest of the partial associations namely GO\*TU, PP\*TU, and PE were not significant hence did not warrant being included in the final model.

An interesting result was that public participation during development & review of city/town plans (PP) was not significant as main term, but became significant in the 2-way interaction effects with town planning department having a unit dealing of Urban agriculture (PP\*TU). Perhaps, this finding tends to point to the fact that public participation during development & review of city/town plans (PP) may become more effective if there is a unit dealing with urban agriculture in the planning department. From the table of partial associations, it would therefore be conclusive to include the main effects, GO and TU in the model, as well as the interaction effect GO\*PP. There is no evidence to include the other variables.

After backward elimination, convergence information was obtained. Table 4.40 shows the convergence information with the final model.

**Table 4.40: Convergence Information**

Generating Class	GO*PP, TU	
Number of Iterations		0
Max. Difference between Observed and Fitted Marginals		.000
Convergence Criterion		.250
a. Statistics for the final model after Backward Elimination.		

Table 4.28 shows that the final model after backward elimination was two 2-way interactions (Homogeneous association) model namely GO\*PP and GO\*TU possible. However, there was no association between PE and TU which may imply that there was a disconnect between public participation on development & review of city/town plans, and town planning department having urban agriculture unit in the three study towns.

The homogeneous association between gardening in Open spaces or road reserves, and public participation on development & review of city/town plans (GO\*PP), tends to indicate that public participation on development & review of city/town plans is essential for the maintenance of the open spaces and road reserves.

Findings from Table 4.40 tends to show that majority of respondents had not been undertaking gardening in open spaces or road reserves in the study towns. Interviews with planners also confirmed that farming in open spaces or roadsides was largely restricted in these towns. However, according to the Sessional Paper Number 3 of 2009, under section 3.4.1.4, on planning for urban agriculture, strong emphasis is put on the adoption and promotion of multi-functional urban land use, and the establishment of an appropriate legal and regulatory framework for the practice, (Kenya, 2009). The full implementation of these two key principles by the planning department is envisaged to provide the planning department with various options, including allowing urban agriculture to be practiced on open spaces or roadsides.

Another viable 2-way interaction (association) was between gardening in Open spaces or road reserves and the town planning department having urban agriculture unit (GO\**TU*). This association tends to show the critical need for a unit to manage farming in open spaces and road reserves.

Results from Table 4.38 revealed that most respondents asserted that Town planning department did not have a unit dealing with urban agriculture in Kisumu and Eldoret towns, while in Kakamega town some respondents agreed there was a unit. The establishment of such a unit would foster the integration and institutionalization of urban agriculture into urban planning. Once established, the unit can provide a central point in the town planning office for the

management and control of urban agriculture. The institutional theory, with its three components regulative, normative and cultural-cognitive pillars provides a perfect way of understanding the benefits of this homogeneous association. For instance, once urban agriculture unit is established, it will provide a regulatory unit for the practice while at the same time, playing its normative role of working as per the norms and meeting the societal expectation of delivering on food security. On the other hand, the urban farmers would help the planning department change its cultural-cognitive (taken for granted "way of doing things in institutions) view by providing feedback and implementing farming in open spaces and roadsides under some regulatory mechanism.

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter covers the summary of findings, conclusions, recommendations, and areas of future research, based on each specific objective of the study. These are presented in the sequence of the study objectives which were as follows;

1. To appraise the socio-economic and environmental status of urban agriculture in the three towns in Western Kenya
2. To establish the effect of planning legislative framework on urban agriculture in the three towns in Western Kenya
3. To analyze the contribution of planning strategies, plans, and programmes to urban agriculture in the three towns in Western Kenya

#### **5.2 Summary of Findings**

##### **5.2.1 The Socio-Economic and Environmental Status of Urban Agriculture**

The first objective of the study sought to appraise the socio-economic and environmental status of urban agriculture in the three towns in Western Kenya. The study investigated the current status of urban agriculture through its social, economic, and environmentally related factors which included: Food nutrition provision, continuous supply of fresh and healthy produce, supplementing household food supply, poultry keeping yielding high income, generation of employment and reuse of greywater in farm reduces discharge to the environment. The current status of urban agriculture was summarized in terms of findings from socio-economic and environmental cross-tabulation of variables of the study.

Findings based on cross-tabulations of variables on the socio-economic and environmental status of urban agriculture show that: Majority of respondents of varying household sizes 2-5, 6-10, and above 10 members, maintained that their main objective of engaging in UA was to improve household food nutrition in all the three towns. Majority of respondents, irrespective of ownership of the plot, affirmed that UA provides fresh and healthy produce in Kisumu and Eldoret towns, while in Kakamega town, majority did not affirm. FGD discussions also confirmed that UA supplements household food supply by providing vegetables, milk, and eggs, and is therefore important in supplementing household food needs and a source of vitamins and proteins to households.

Findings show that majority of respondents who were keeping indigenous livestock affirmed that poultry keeping resulted in high income in Kisumu, Kakamega, and Eldoret towns, while majority of those keeping exotic livestock similarly affirmed that poultry keeping resulted in high income, except in Eldoret while respondents disagreed. Thus, irrespective of the type of livestock kept, majority agreed that poultry keeping resulted in high income in Kisumu and Kakamega, while, those keeping indigenous livestock or exotic either agreed or disagreed in Eldoret. Due to inadequate spaces for practicing UA, most livestock farmers in the town practiced farming in their backyards. However, a few stakeholders still viewed UA more or less as a leftover land use category, which acts like a filler or complimentary user or Locally Unwanted Land Use (LULU) rather than a mainland user category.

Overall, majority of eggs producers maintained that UA generates self-employment in all towns, milk producers agreed to the same in Kisumu and Eldoret, Majority of kales producers maintained that UA generates self-employment in Kisumu and Kakamega, and likewise local vegetable producers in Kakamega and Eldoret towns. Findings show that the reuse of grey water

on farms reduces discharges to the environment in Kisumu, Kakamega, and Eldoret, with exception of those who used stream, river, or lake water, and sewerage in Kakamega town who thought otherwise. FGD discussion revealed UA has benefits that can conserve the environment if practiced under proper regulation namely; cleaning of the environment during waste collection, production of manure for farming, provision of clean and safe energy (biogas), and mitigation of climate change effects in urban environments.

Loglinear analysis used three selected variables which include: Food Nutrition (FN), Poultry yield high income (PI), and Greywater reuse reduces discharge to the environment (GW). The possible models for selection were 1<sup>st</sup> K-way and Higher Order Effects and 1<sup>st</sup> K-way Effects (all with p-value < 0.05), while partial associations were between FN\*GW(p-value=0.014), and FN, PI & GW all significant with p=0.000. However, the final model after backward elimination was between variables FN\*GW, and FN \*PI. Thus, Food Nutrition (FN) and Greywater reuse reduce discharge to the environment (GW) displayed a 2-way interaction effect, which implies that most urban farmers were recycling greywater from their kitchens to grow crops in their gardens. Similarly, a 2-way interaction effect existed between food nutrition and poultry keeping yielding high income, meaning farmers were practicing UA for food nutrition and income.

### **5.2.2 The Effect of Planning legislative framework on Urban Agriculture**

The second objective of the study was to establish the effect of the planning legislative framework on urban agriculture in the three towns in Western Kenya. The main features of the planning legislative framework that were investigated included; planning policies, Laws, regulations, law enforcement and compliance, and taxation and penalties.

The study found majority of respondents who produced eggs, kales, and local vegetables did not affirm that national land policy is supportive of UA in all towns. The national land policy highlights the plight of UA as an activity that is not adequately facilitated and regulated, although these two impediments have not been effectively implemented at the county level.

Majority of respondents with various plot sizes maintained that regulations on land use designations/allotment on open spaces were not beneficial to farmers in Kisumu and Kakamega, while in Eldoret town those with plot sizes 101-1000m sq. said that regulations on land use designations or allotment of open spaces were beneficial to UA farmers. This finding shows that majority of the respondents with various plot sizes maintained that regulations on land use designations or allotment of open spaces were not beneficial in Kisumu and Kakamega, with only a few urban farmers in Eldoret town maintaining it was beneficial. It was revealed that urban agriculture activities are discouraged in urban residential plots due to the prevailing attitude of NIMBY among town dwellers.

The study found that whereas most local livestock keepers were not aware of the prohibition of livestock keeping in town, majority of exotic livestock keepers were aware in all towns. Despite livestock keeping being prohibited in town by most municipal by-laws, the practice especially of keeping poultry and dairy was common due to the high returns accrued from such ventures. Key informants indicated that the Physical and land use planning regulations framework was being used in the absence of municipal by-laws or substantive specific county legislation, to regulate UA or locally unwanted land use (LULUs) activities in town. It appears there were no legal vacuums as legislation gaps created, through the repeal of the old municipal by-laws, were being filled through use of domesticated national laws and regulations. FGD discussions confirmed that certain UA activities are also prohibited in town, such as the construction of certain farm

structures like a greenhouse, which may require an Environmental Impact Assessment (EIA) as a requirement of the National Environmental Management Authority (NEMA). Key informants indicated that planning does not "support" but "allows" UA. "Allowing" means that it is permissible within a certain zoned area while "Supporting" means facilitating, promoting, or championing UA. This means that urban agriculture is allowed but not supported. It appears that planning has allowed for the inclusion of urban agriculture in its statutes, like the national land policy and urban Areas and Cities Act, with emphasis on the need for facilitation and regulatory mechanism as well as integrated development planning, but is yet to support the actual implementation of the practice on the ground.

Findings show that the urban farmers were being affected negatively by their inclusion in the tax net espoused by the government, with tax charged being not fair specifically for milk, eggs, kales, and local vegetables in Eldoret, eggs in Kakamega and kales in Kisumu town.

Licensing fees charged on UA-related businesses were unfair hence negatively affecting their operations by reducing their income. However, key informants confirmed that there were no special licensing fees or exceptions for urban farmers. Tax and licensing fees, as fiscal policy tools for generating revenue, had a negative influence on UA activities in the three study towns, instead of being incentives for the facilitation and regulation of UA. The study found that majority of the urban farmers who produced various commodities were of the view that penalties imposed for non-compliance to regulations of UA were not fair, while only a few milk, egg, and kales producers were of a contrary opinion in Kisumu and Kakamega towns.

Key informants indicated that farmers were sometimes given exemptions with regard to compliance and enforcement of environmental standards, depending on the kind of type of agricultural production activity being carried out. For instance, vegetable growing is permitted



because it is a short-growing crop, while fruit trees are beneficial for providing shade that creates micro-climates hence mitigating the effects of hot weather. The key informant revealed that enforcement is usually done, only when there is a complaint from the neighbourhoods, which means that law enforcement was being applied discriminately and in an ad hoc manner, thereby alluding to weak law enforcement on UA activities by planning authorities.

Majority of respondents maintained that the zoning ordinance permits cultivation of crops within plots in town, except in Kisumu where Municipal by-laws regulating UA were enforced. Key informants confirmed that the planning department often allocates some ten percent (10%) of the total plot size as green space, within low-density residential areas. Although urban agriculture may be practiced within the green space, the word "green space" is rarely interpreted or understood to mean a space for practicing urban agriculture, but rather a place for planting flowers or landscaping. This implies that urban agriculture is a passive and indirectly planned issue that is sometimes regarded as a locally Unwanted Land Use (LULUs) or simply a tolerated practice.

Irrespective of awareness of physical and land use planning regulations, majority of respondents maintained that town planning department did not have a specific unit dealing with urban agriculture. The establishment of an urban agriculture unit would go a long way in facilitating interdepartmental coordination, promotion, and regulation of urban agriculture thus fulfilling the aspirations of the land policy and urban areas and cities Act.

Most people who either keep exotic or indigenous livestock maintained that penalties for non-compliance were not fair to UA farmers in the three towns. Key informants indicated that town administrators tended to use the old Municipal by-laws, in the absence of domesticated laws or

new county legislations, where there were various penalties (fines), including those for animals found roaming in town. FGD revealed that law enforcers were extorting money from offenders whose cattle were found roaming in town and, that enforcement officers arbitrarily applied municipal by-laws to their advantage. Urban farmers complained of "kangaroo courts"-that is the unofficial courts, where an offender is charged on the spot without being taken to the court. This finding points to the incoherent manner in which regulatory measures were applied within the study towns, thereby affecting UA farmers negatively.

Loglinear analysis for objective two involved selected variables which included: Land policy (LP), Physical and land use planning Act (PL), and Municipal by-laws(MB). The possible models selected were 1<sup>st</sup> K-way and Higher Order Effects and 1<sup>st</sup> K-way Effects all at  $p=0.000$  which were all significant. Partial associations were  $LP*MB(p=0.011)$ , LP, PL & MB which were all significant at  $p=0.000$ . Loglinear analysis revealed the final model after backward elimination was determined by assessing quality of uniform order models which included complete independence model, 2-way interactions (Homogeneous association) model and the 3-way interaction (saturated) model. Table 4.40 shows that there was an association relationship between Land policy and Municipal by-laws ( $LP*MB$ ), and Land Policy and Physical and land use planning Act ( $LP*PL$ ).

The homogeneous association revealed between Land Policy and Physical and land use planning Act ( $LP*PL$ ) suggests that land policy and physical and land use planning are two statutes that are closely intertwined. One of the findings of this study was that the national land policy was not influencing urban agriculture much, and this can be attributed to a disconnect between the Land policy and the physical and land use planning Act. Currently, the physical and land use planning Act does not view or mention urban agriculture as one of the land uses,

hence does not cater for its activities. This study finds that since land policy already considers UA as a planning issue, the physical and land use planning Act ought to consider including UA as a land use category, instead of viewing it as a LULU, complimentary, or filler land use in planning. In the long run, the land policy, the physical and land use planning act (PLUPA), and any municipal by-law or county legislation ought to work in tandem, if proper facilitation and regulation of UA is to be realized.

### **5.2.3 Contribution of Planning Strategies, Programmes, and Plans to Urban Agriculture**

The third objective was to analyze the contribution of planning strategies, plans, and programmes to urban agriculture in the three towns in Western Kenya. The main variables that were under study included: planning strategies, programmes, and plans related to urban agriculture.

In terms of planning Strategies used to integrate urban agriculture into planning, this study finds shows that there is no established office to facilitate urban agriculture in all three towns. An administrative structure, represented by an urban agriculture office/unit, would be ideal for improving performance and responsiveness to delivery of urban agriculture activities to urban farmers. Key informants confirmed that previously before devolution in 2012, the department of agriculture used to have a desk officer in charge of urban agriculture projects, but this was only possible whenever the department was rolling out a specific project on UA, otherwise, such officers would revert to normal extension work once the project ends. This finding shows that urban agriculture has not been properly institutionalized either in the department of Agriculture or planning. Additionally, key informants asserted that the planning administrative framework for practicing urban agriculture was inadequate because the city/town management board had not been established to set up guidelines or rules for the practice of urban agriculture. This impedes

the facilitation and regulation of urban agriculture in towns. The study found that majority maintained that rooftop and window gardening was not used as a way of beautification in towns. The use of urban agriculture as a beautification or landscaping strategy ought to be used as a planning strategy to incorporate UA into urban planning.

Most respondents who owned plots maintained that plans of estates and residential buildings have special zones/spaces for gardening in Kisumu and Eldoret towns. Those who did not own plots had majority who were not sure in Kisumu while in Kakamega respondents asserted that plans of estates and residential buildings did not have special zones/spaces for gardening. This finding shows that UA was given some special preference by the planning department, during land allocation in spatial planning or drawing plot plans for estates and residential buildings

The finding shows that majority of respondents had not been undertaking gardening in open spaces or road reserves in the study towns. However, urban farmers have an opportunity to liaise with planners and town management authorities to allow them to garden in open spaces and road reserves, so long as this is done under strict laws and regulations such as the Physical and land use planning regulations. The key informant revealed that the use of open spaces is largely restricted by town authorities, and there are no specific plans which articulate the isolation of some open spaces for urban agriculture. Planners are working on urban agriculture plans in other nations including China and Korea. In Kenya, UA is well grounded in the national legislations, such as the Urban Areas and Cities Act 2012 sec ( 20, 36 & 40), but lacks specific county legislation to guide it, hence is often considered as supportive, complementary land use or simply a locally unwanted land use (LULU) rather than a stand-alone user.

In terms of plans and programmes for the integration of urban agriculture, findings show that most of the support for UA activities was received from either department of livestock or

agriculture, with only little support coming from the planning department. FGD revealed that the department of Agriculture was directly supporting urban farmers with agrochemicals for spraying vegetables, day-old chicks, dairy cows, and goats. The finding that county governments were supporting urban farmers shows that despite the absence of a specific urban agriculture policy or strategy, the practice still receives agricultural extension services from the county department of agriculture.

Key informants revealed that from a planning point of view, the main plans, strategies, and programmes undertaken by planning mainly include: County Integrated Development Plan (CIDP), Integrated Development Plan (IDEP), Integrated Strategic Urban Development Plan (ISUDP), Local Physical and Land Use Development Plans (LPLUDPs), County spatial Plan, Municipal spatial plan, Master plan among others. Findings show that there was no single mention of the term "urban agriculture" either as a programme or a project in Annual Development Programme (ADP), especially in Uashin Gishu. Given that agricultural extension services are usually, county-wide, urban agriculture is therefore part and parcel of normal agricultural extension in towns, although without any defined specific framework.

In terms of public participation in plans and programmes of planning, In general, irrespective of the number of years of practice and with exception of a few respondents in Eldoret and Kakamega, majority of urban farmers maintained they were not involved during public participation in development of city/town plans.

Findings show that, except for a few farmers who were involved in public participation, majority of urban farmers were not involved in public participation during the development of city/town plans. The lack or low involvement in public participation by urban farmers points to the framing

and design of the physical and land use planning Act(PLUPA) No. 13 of 2019, which does not mention urban farmers as one of its stakeholders in planning. This deficiency in the wording of PLUPA means that planners cannot specifically target urban farmers in public participation, a situation that ends up excluding urban farmers from urban development activities. The lack of involvement of urban farmers in public participation during the development and review of city/town plans, therefore implies that urban farmers are not considered "key stakeholders" by the county planning authority, and their "interest" and "potential impacts" are less important in development and review of city/town plans.

Key informants confirmed that urban farmers have not been specifically targeted, and hence their voices have been missing in planning. UA is not considered a land use category in planning, and therefore there has been no deliberate and proactive intervention to get their views. This implies that the voices of urban farmers are generally missing in planning since there is no deliberate effort to identify and isolate their issues during planning. In general, inadequate participation of urban farmers during the development & review of town plans and programmes, therefore denies the planners the opportunity to obtain good feedback capable of enhancing planning.

Loglinear analysis results show that the variables used were gardening in open spaces or road reserves (GO), public participation during development & review of city/town plans(PP), and town planning department having a unit dealing with urban agriculture(TU). The possible models selected were the 1<sup>st</sup> and 2<sup>nd</sup> K-way and Higher Order Effects ( $p=0.000$ ), as well as the 1<sup>st</sup> and 2<sup>nd</sup> K-way Effects. The partial associations generated were GO\*PP tends to indicate that public participation during development & review of city/town plans is essential for the maintenance of the open spaces and road reserves in towns. The second final model GO\*TU shows that there is a critical need for a unit to manage farming in open spaces and road reserves.

The establishment of such a unit would foster the integration and institutionalization of urban agriculture into urban planning. Once established, the unit can provide a central point in the town planning office for the management and control of urban agriculture.

### 5.3 Conclusions

- i. Urban agriculture plays a progressive and critical socio-economic, and environmental role in all three study towns. It improves food nutrition, helps in supplying fresh produce to urban farmers provides high income, provides high income through poultry keeping, and generation of self-employment for milk, eggs, and vegetable producers. It also helps in reuse of grey water in farms to produce food and protect the environment. Lastly, Loglinear analysis concluded there was a final model among variables between FN\*GW, and FN \*PI, all showing a 2-way interaction effect (homogenous association). FN\*GW model implies that most urban farmers were recycling greywater from their kitchens to grow crops in their gardens as well as protect the environment. Similarly, the FN\*PI model shows that urban farmers were practicing UA for food nutrition and income.
- ii. It is concluded that the planning legislative framework affects urban agriculture unequally among the urban farmers in the three towns, thereby limiting the facilitation and regulation of urban agriculture. Whereas national planning legislative frameworks impact positively on urban agriculture, through the inclusion of UA in the policies, legislations, and regulations, inadequate county legislation, and weak law enforcement and compliance at the county level do affect UA negatively, thereby hindering its regulation. Loglinear analysis revealed the final model after backward elimination was an association relationship between Land policy and Municipal by-laws (LP\*MB), and Land Policy and Physical and land use planning Act (LP\*PL). The LP\*MB model indicates

that Land policy is closely intertwined but appears to have a disconnect, with LP advocating for adequate facilitation and regulation of urban agriculture into planning while MB (municipal by-laws or county legislations) remains more prohibitive rather than facilitative. Similarly, the LP\*PP model shows an association whereby LP stands for adequate facilitation and regulation of UA, while PP (Physical and land use planning Act –PLUPA) remains largely silent on matters of urban agriculture in urban areas.

- iii. The study concludes that planning strategies, plans, and programs do not immediately contribute to urban agriculture, with the exception of when residential plots are being drawn and spaced out, when 10% of the plot is frequently left as green space for urban agriculture or other forms of greenery. Due to a lack of suitable county legislation and an oversight entity for planning, interdepartmental coordination, and implementation, neither planning nor the department of agriculture has formalized UA. Urban agriculture (UA) is frequently seen as a supplementary, filler, or locally undesirable Land Use (LULUs) activity in urban areas; as a result, urban farmers are not taken into account as stakeholders who might have interests and potential impacts during public participation in planning. Urban strategies, plans, and programmes do not include urban farmers' perspectives in their planning. Loglinear analysis shows that the final model was among variables namely: Gardening in open spaces(GO) and public participation during development & review of city/town plans (PP) i.e GO\*PP, and Gardening in open spaces (GO) and Town planning department having UA unit(TU) i.e GO\*TU. The model GO\*PP implies indicates that public participation during development & review of city/town plans is essential for the maintenance of the open spaces and road reserves in towns. The second final model GO\*TU shows that there is a critical need for a unit to



manage farming in open spaces and road reserves. The establishment of such a unit would foster the integration, legitimization, and institutionalization of urban agriculture into urban planning. Once established, the unit can act as an oversight body at the town planning office for management and control of urban agriculture activities in town.

#### **5.4 Contribution of the Study**

This study has made three key contributions in science, practice and policy.

#### **5.5 Recommendations**

##### **5.5.1 Recommendations for Improving Urban Agriculture**

- i. Loglinear analysis revealed a final model between Food nutrition, greywater reuse reduce discharge to Environment, and poultry keeping yielding high income (FN\*GW & FN\*PI). This implies that a connection exists between provision of water for production of nutritious food as well as earning income. Town management authorities should therefore facilitate urban agriculture by providing water for urban farming so as to improve food nutrition and income of urban farmers.
- ii. The study showed that there was an association relationship between Land policy and Municipal by-laws, Land Policy and Physical and land use planning Act (LP\*MB & LP\*PL). It is therefore recommended that an appropriate specific urban agriculture county legislation or municipal by-laws be formulated and enacted, to legitimize and institutionalize UA for proper facilitation and regulation in the study towns. This may require the Physical and land use planning Act (PLUPA) to be reviewed to provide a nexus between land policy and municipal by-laws.
- iii. Loglinear analysis also showed there was a relationship between Gardening in open spaces, public participation during development & review of city/town plans, and Town

planning department having UA unit (GO\*PP & GO\*TU). Participation during development & review of city/town plan as necessary for maintaining open spaces and road reserves, while establishing an urban agriculture unit domiciled in planning department would be crucial in providing oversight for the integration, legitimization, and institutionalization of UA in urban strategies, plans, and programs. It is therefore recommended that public participation in planning be more participatory and inclusive of urban farmers for better integration of urban agriculture in planning strategies, plans, and programmes of planning in the three towns

- iv. Integrate urban agriculture in all planning strategies, plans and programmes, in conformity with the aspirations of the national policies and legislations, particularly land policy and Urban Areas and Cities Act

### **5.5.2 Recommendations for Further Research**

Based on the conclusion drawn and recommendations for improvement provided by the study, the following areas were suggested for further research:

- i. Conduct a survey on the risks and hazards of using of sewerage water in urban agriculture
- ii. Carry out an economic analysis of the utilizing grey water in improving urban agricultural productivity
- iii. Establish opportunities and threats of institutionalizing urban agriculture for food and income provision

## REFERENCES

- Abera, A., Tadesse, G., & Belayneh, M. (2017). Practices, roles and challenges of urban agriculture in south western part of Ethiopia: the case of bedelle tow. *International Journal of Scientific and Research Publications*, 7(5), 609-610.
- Abiodun, A. O., Olaitan, O. O., & Abimbola, T. A. (2018). Planning regulations and implementation mechanisms in postcolonial Lagos. *Journal of Globalization Studies*, 9(1), 91-106.
- Al Jarah, S. H., Zhou, B., Abdullah, R. J., Lu, Y., & Yu, W. (2019). Urbanization and urban sprawl issues in city structure: A case of the Sulaymaniah Iraqi Kurdistan region. *Sustainability (Switzerland)*, 11 (2).
- Altieri, M. A. and Nicholls, C. I. (2018). Urban Agroecology: Designing biodiverse, productive and resilient city farms. *Agro Sur*, 46, 49–60. doi: 10.4206/agrosur.2018.v46n2-07.
- Aluko, O. (2011). Functionality of the town planning authorities in effecting urban and regional planning laws and control in Nigeria: The case of Lagos State. *African Research Review*, 5(6), 156-171.
- Andersson, K., & Van Laerhoven, F. (2007). From local strongman to facilitator: Institutional incentives for participatory municipal governance in Latin America. *Comparative political studies*, 40(9), 1085-1111.
- Anwarudin, O., & Maryani, A. (2017). The effect of institutional strengthening on farmers participation and self-reliance in Bogor Indonesia. *International Journal of Research in Social Sciences*, 7(4), 409-422.
- Aribigbola, A. (2013). Constraints to urban land use planning and management in Nigeria: Evidence from Ondo state. *Journal of Environment*, 2(3), 66-73.
- Artmann, M., & Sartison, K. (2018). The role of urban agriculture as a nature-based solution: A review for developing a systemic assessment framework. *Sustainability*, 10(6), 1937.
- Atamewan, E. E. (2019). Factors affecting implementation and compliance with housing standards for sustainable housing delivery in Bayelsa State, Nigeria. *European Scientific Journal*, 15(3), 210-222.
- Ayaga, G., Kibata, G., Lee-Smith, D., Njenga, M., & Rege, R. (2005). Policy prospects for urban and peri-urban agriculture in Kenya. *Policy Dialogue Series*.
- Ayambire, R. A., Amponsah, O., Peprah, C., & Takyi, S. A. (2019). A review of practices for sustaining urban and peri-urban agriculture: Implications for land use planning in rapidly urbanising Ghanaian cities. *Land Use Policy*, 84, 260-277.
- Bandaragoda, D. J. (2000). *A framework for institutional analysis for water resources management in a river basin context* (Vol. 5). IWMI.
- Bassey, D. E. (2020). *Harnessing the regulatory framework for compliance with environmental regulations in the hydrocarbon sector in Nigeria* (Doctoral dissertation).
- Beattie, L., & Haarhoff, E. (2018). Urban growth, liveability and quality urban design: questions about the efficacy of urban planning systems in Auckland, New Zealand. *Journal of Contemporary Urban Affairs*, 2(2), 12-23.
- Bellwood-Howard, I., Häring, V., Karg, H., Roessler, R., Schlesinger, J., & Shakya, M. (2015). *Characteristics of urban and peri-urban agriculture in West Africa: results of an exploratory survey conducted in Tamale (Ghana) and Ouagadougou (Burkina Faso)* (Vol. 163). International Water Management Institute (IWMI).
- Bingen, J., Colasanti, K., Fitzpatrick, M., and Nault, K. (2009). *Urban Agriculture*. In L. E. Phoenix & L. Walter (Eds.), *Critical food issues: Problems and state-of-the art*

*solutions worldwide*: Greenwood.

- Bonye, S. Z., Yiridomoh, G. Y., & Bebelleh, F. D. (2021). Compliance with land use regulations in peri-urban areas in Ghana: a study of Bamahu and Danko residential areas in Wa municipality, Upper West Region. *GeoJournal*, 86(6), 2845-2859.
- Borron, A., & Holt, J. (2016). Expo Milano 2015: the overview, issue, and future for agricultural communicators. *Journal of Applied Communications*, 100(3), 7-12.
- Boyle, G. W., & Guthrie, G. A. (2003). Investment, uncertainty, and liquidity. *The Journal of finance*, 58(5), 2143-2166.
- Berger, D. E. (2017). *Log-linear analysis of categorical data*. Working paper, Claremont Graduate University]. Retrieved from [https://www.researchgate.net/publication/320505747\\_Log-linear\\_Analysis\\_of\\_Categorical\\_Data](https://www.researchgate.net/publication/320505747_Log-linear_Analysis_of_Categorical_Data).
- Mansfield, B., & Mendes, W. (2013). Municipal food strategies and integrated approaches to urban agriculture: Exploring three cases from the global north. *International Planning Studies*, 18(1), 37-60.
- Brown, P. D. (1966). Role of Urban Planning Agencies. *Archives of Environmental Health: An International Journal*, 12(3), 394-398.
- Buxton, M., & Carey, R. (2014). The use of planning provisions and legislation to protect peri-urban agricultural land. *Australian Environment Review*, 29, 191-195.
- Buxton, M., Carey, R., & Phelan, K. (2016). The role of peri-urban land use planning in resilient urban agriculture: A case study of Melbourne, Australia. In *Balanced Urban Development: Options and Strategies for Liveable Cities* (pp. 153-170). Springer, Cham.
- Castillo, S. R., Winkle, C. R., Krauss, S., Turkewitz, A., Silva, C., & Heinemann, E. S. (2013). Regulatory and other barriers to urban and peri-urban agriculture: A case study of urban planners and urban farmers from the greater Chicago metropolitan area. *Journal of Agriculture, Food Systems, and Community Development*, 3(3), 155-166.
- Chigudu, A. (2021). The changing institutional and legislative planning framework of Zambia and Zimbabwe: nuances for urban development. *Land Use Policy*, 100, 104941.
- Chireshe, E. (2021). Modeling Mortality by Causes of Death in South Africa Using Log-linear Analysis.
- Slade, C., Baldwin, C., & Budge, T. (2016). Urban planning roles in responding to food security needs. *Journal of Agriculture, Food Systems, and Community Development*, 7(1), 33-48.
- Cinà, G., & Khatami, F. (2017). Integrating urban agriculture and urban planning in Mashhad, Iran; a short survey of current status and constraints. *Agroecology and Sustainable Food Systems*, 41(8), 921-943.
- Cissé, O., Gueye, N. F. D., & Sy, M. (2005). Institutional and legal aspects of urban agriculture in French-speaking West Africa: from marginalization to legitimization. *Environment and Urbanization*, 17(2), 143-154.
- City of Cape Town (CoCT, 2007). *Urban agricultural policy for the city of Cape Town*. Republic of South Africa
- Cockx, L., Colen, L., De Weerd, J., & Paloma, G. Y. (2019). *Urbanization as a driver of changing food demand in Africa: evidence from rural-urban migration in Tanzania*.
- Cohen, N. (2020). The changing role of urban agriculture in municipal planning: from planning for urban agriculture to urban agriculture for planning. In *Achieving sustainable urban agriculture* (pp. 23-36). Burleigh Dodds Science Publishing.

- Cohen, N., Reynolds, K., and Sanghvi, R. (2012). *Five Borough Farm: Seeding the Future of urban agriculture in New York City*
- Cresswell, J. W. (2012). Educational research: Planning, conducting, and evaluating quantitative and qualitative research. *Lincoln: Pearson.*
- Cresswell, J. W. (2014). Research design: qualitative, quantitative, and mixed methods approach. *Handbook of mixed methods in social and behavioral research (pp 209-240)* Thousand Oaks, California: SAGE Publications.
- Cresswell, J. W. (2012). Educational research: Planning, conducting, and evaluating quantitative and qualitative research. *Lincoln: Pearson.*
- Cresswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into practice, 39*(3), 124-130.
- Daftary-Steel, S., Herrera, H., & Porter, C. M. (2015). The unattainable trifecta of urban agriculture. *Journal of Agriculture, Food Systems, and Community Development, 6*(1), 19-32.
- Danso-Abbeam, G., Ehiakpor, D. S., & Aidoo, R. (2018). Agricultural extension and its effects on farm productivity and income: insight from Northern Ghana. *Agriculture & Food Security, 7*(1), 1-10.
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American sociological review, 147*-160.
- Eckerd, A., & Heidelberg, R. L. (2020). Administering public participation. *The American Review of Public Administration, 50*(2), 133-147.
- Erickson, D. L., Lovell, S. T., & Méndez, V. E. (2013). Identifying, quantifying and classifying agricultural opportunities for land use planning. *Landscape and Urban Planning, 118*, 29-39.
- Eriksen-Hamel, N., & Danso, G. (2010). Agronomic considerations for urban agriculture in southern cities. *International Journal of Agricultural Sustainability, 8*(1-2), 86-93.
- Étienne, J. (2010). Compliance theories. *Revue française de science politique, 60*(3), 493-517.
- Eyaa, S., & Oluka, P. N. (2011). Explaining non-compliance in public procurement in Uganda. *International journal of business and social science, 2*(11).
- FAO (2013). *The State of Food Insecurity in the World. The multiple dimensions of food*
- Fiene, R. (2016). Theory of regulatory compliance. *SSRN Electr. J, 9*.
- Foeken, D. (2006). *To subsidise my income: urban farming in an East-African town*. Brill.
- Foley, J. A., Ramankutty, N., Brauman, K. A., Cassidy, E. S., Gerber, J. S., Johnston, M., ... & Zaks, D. P. (2011). Solutions for a cultivated planet. *Nature, 478*(7369), 337-342.
- Fowler Jr, F. J. (2013). *Survey research methods*. Sage publications.
- Freisinger, U. B., Specht, K., Sawicka, M., Busse, M., Siebert, R., Werner, A., ... & Walk, H. (2015). There's something growing on the roof. *Rooftop greenhouses. Idea, Planning, Implementation. Leibniz Centre for Agricultural Landscape Research (ZALF), Müncheberg.*
- Fuseini, I. (2016). *Urban governance and spatial planning for sustainable urban development in Tamale, Ghana*. Unpublished dissertation submitted to Stellenbosch University.
- Gatara, T. H. (2010). Introduction to research methodology. *Nairobi, Kenya. The Olive Marketing and Publishing Company.*
- Gelan, D. T., & Seifu, G. (2016). Determinates of Employment Generation through Urban Agriculture: The Case of Bishoftu Area of Oromia Region, Ethiopia. *studies, 26*.

- Giseke, U., Gerster-Bentaya, M., Helten, F., Kraume, M., Scherer, D., Spars, G., ... & Mdafai, M. (2015). *Urban agriculture for growing city regions: connecting urban-rural spheres in Casablanca*. Routledge.
- Githugunyi, D. K. (2014). *An Assessment of the Contribution of Urban Agriculture to Households' Livelihoods in Roysambu Ward, Nairobi County* (Doctoral dissertation, Master's Thesis, Nairobi, Kenya: Kenyatta University).
- Glover, J. L., Champion, D., Daniels, K. J., & Dainty, A. J. (2014). An Institutional Theory perspective on sustainable practices across the dairy supply chain. *International Journal of Production Economics*, 152, 102-111.
- Godfray, H. C. J., Beddington, J. R., Crute, I. R., Haddad, L., Lawrence, D., Muir, J. F., ... & Toulmin, C. (2010). Food security: the challenge of feeding 9 billion people. *science*, 327(5967), 812-818.
- Grewal, S. S., & Grewal, P. S. (2012). Can cities become self-reliant in food?. *Cities*, 29(1), 1-11.
- Grilo, F., Gonçalves, P., Luz, A. C., Branquinho, C., & Santos-Reis, M. Informal allotment gardens in Lisbon: the gardener's perspective.
- Guendel, S., & Richards, W. (2002). Peri-urban and urban livestock keeping in East Africa-a coping strategy for the poor. *Scoping study commissioned by the DFID Livestock Production Programme.: Natural Resources Institute*.
- Güneralp, B., Lwasa, S., Masundire, H., Parnell, S., & Seto, K. C. (2017). Urbanization in Africa: challenges and opportunities for conservation. *Environmental research letters*, 13(1), 015002.
- Peters, B. G. (2000). Institutional theory: Problems and prospects.
- Hagey, A., Rice, S., & Flournoy, R. (2012). Growing urban agriculture: Equitable strategies and policies for improving access to healthy food and revitalizing communities. *Report by PolicyLink, Oakland, CA*, 1-52.
- Halloran, A., & Magid, J. (2013). The role of local government in promoting sustainable urban agriculture in Dar es Salaam and Copenhagen. *Geografisk Tidsskrift-Danish Journal of Geography*, 113(2), 121-132.
- Hodgson, Geoffrey. (2006). *What Are Institutions? Journal of Economic Issues*. XL. 1-25. [10.1080/00213624.2006.11506879](https://doi.org/10.1080/00213624.2006.11506879).
- Hodgson, K., Campbell, M. C., & Bailkey, M. (2011). *Urban agriculture: Growing healthy, sustainable places*. American Planning Association.
- Hollingsworth, J. R. (2000). Doing institutional analysis: implications for the study of innovations. *Review of international political economy*, 7(4), 595-644.
- Horst, M., McClintock, N., & Hoey, L. (2017). The intersection of planning, urban agriculture, and food justice: A review of the literature. *Journal of the American Planning Association*, 83(3), 277-295.
- Hotho, J. J., & Pedersen, T. (2012). Beyond the 'rules of the game': Three institutional approaches and how they matter for international business. *Handbook of institutional approaches to international business*, 236, 236-273.
- Howell, D. C. (1992). *Statistical methods for psychology*. PWS-Kent Publishing Co.
- Jacobs, P., & Xaba, T. (2008). Women in urban and peri-agriculture: Sustaining livelihoods in the Cape Metropolitan Area. *Agenda*, 22(78), 186-197.
- Yin, R., Yao, S., & Huo, X. (2013). China's forest tenure reform and institutional change in the new century: What has been implemented and what remains to be pursued?. *Land Use*

*Policy*, 30(1), 825-833.

- Thoenig, J. C. (2012). Institutional Theories and Public Institutions: New Agendas and. *The SAGE handbook of public administration*, 169.
- Onwuegbuzie, A. J., Johnson, R. B., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of mixed methods research*, 1(2), 112-133.
- Kabando E. K., & Wuchuan, P. (2014). Flaws in the Current Building Code and Code Making Process in Kenya. *Civil and Environmental Research*, 6(5), 24-30.
- Kamwele, H. W., Onyango, G. M., & Wagah, G. G. (2016). Spatial Location Factors Affecting the Integration of Urban Agriculture into Land Use Planning of Eldoret Municipality, Kenya. *International Journal of Liberal Arts and Social Science*, 4(3), 41-57.
- Kamwele, H. W., Onyango, G. M., Wagah, G. G., & Nyström, M. (2014). Legal and policy framework affecting the development of urban agriculture market in Eldoret Municipality, Kenya. *Business and Management Review*, 3(11), 53-64.
- Kathambi, B., & Ogutu, F. A. (2021). Effects of Institutional Framework Lapses in Solid Waste Management; Case of Ngomongo, Nairobi, Kenya.
- Kenya, Republic of (2002). *Physical Planning handbook*. Ministry of Lands and Settlement. Government printer
- Kenya, Republic of (2011). Office of the President. *National Urban Development Policy*. Government printer. Nairobi
- Kenya, Republic of (2012). *County Governments Act No. 17 of 2012*. Laws of Kenya.
- Kenya, Republic of (2012). *Urban Areas and Cities Act Chapter 275*. Laws of Kenya. Published
- Kenya, Republic of (2015). *The Nairobi City County Urban Agriculture Promotion and Regulation*
- Kenya, Republic of (2016). *National Land Commission Guidelines pdf. "Sustainable Urban Land Use Planning to realise: internationally competitive, livable, functional,*
- Kenya, Republic of (2007b). Kenya Vision 2030. Government of Kenya.
- Kenya, Republic of (2009). *Sessional Paper No.3 on Land Policy*. Ministry of Lands and Physical Planning. Government Press, Nairobi.
- Kenya, Republic of (2017a). *County Integrated Development Plan, 2018 –2022. The Department of Economic Planning and Investments*. website: [www.kakamega.go.ke](http://www.kakamega.go.ke).
- Kenya, Republic of (2017b). *County Integrated Development Plan, 2018 –2022. The Department .County Government of Kakamega*
- Kenya, Republic of (2019). *The Physical and Land Use Planning Act, No. 13 of*
- Kenya, Republic of (2020). Physical and Land use Planning (County Physical and Land Use
- Kenya, Republic of, (2004). *Kisumu Development Plan 2004 -2009*. City development Plan
- Kenya, Republic of, (2007d). *Basic Report on Well-Being in Kenya, based on Kenya Integrated Household Survey*. KNBS.
- Kenya, Republic of, (2010). *Constitution of Kenya*. Laws of Kenya. Published
- Kenya, Republic of, (2017c). *County Integrated Development Plan, 2018 –2022. The Department . County Government of Kisumu*
- Kenya, Republic of, (2019). Agriculture Sector transformation and Growth Strategy (ASTGS-2019-2029).
- Khalilnezhad, S. M. R. (2016). Urban Agriculture as a Tool for City and Landscape Planning in Iran with Emphasize On the Role of Persian Garden.
- Kibiti, J. G. (2017). *Factors Influencing Adoption of Urban Hydroponic Farming. A Case of*

- Meru Town, Meru County, Kenya* (Doctoral dissertation, University of Nairobi).
- Kitur, R. C. (2019). *Barriers to implementing urban plans in Kenya* (Doctoral dissertation, Walden University).
- Kombo, D. K., & Tromp, D. L. (2006). Proposal and thesis writing: An introduction. *Nairobi: Paulines Publications Africa*, 5(1), 814-30.
- Koont, S. (2008). A Cuban success story: urban agriculture. *Review of Radical Political Economics*, 40(3), 285-291.
- Korir, S. C., Rotich, J. K., & Mining, P. (2015). Urban agriculture and food security in developing countries: a case study of Eldoret municipality, Kenya.
- Kortright, R., & Wakefield, S. (2011). Edible backyards: a qualitative study of household food growing and its contributions to food security. *Agriculture and Human Values*, 28(1), 39-53.
- Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.
- Kothari, C. R., & Guarav, G. (2015). *Research Methodology; Methods and Techniques (Third edition)* New Age International(P) Ltd, Publisher.
- Krause, R. M., Feiock, R. C., & Hawkins, C. V. (2016). The administrative organization of sustainability within local government. *Journal of Public Administration Research and Theory*, 26(1), 113-127.
- Kumar, C. R. (2005). *Research Methodology*. New Delhi: APH Publishing Corporation.
- Kutiwa, S., Boon, E., & Devuyst, D. (2010). Urban agriculture in low income households of Harare: an adaptive response to economic crisis. *Journal of Human Ecology*, 32(2), 85-96.
- Kuusaana, E. D., & Eledi, J. A. (2015, December). As the city grows, where do the farmers go? Understanding Peri-urbanization and food systems in Ghana-Evidence from the Tamale Metropolis. In *Urban Forum* (Vol. 26, No. 4, pp. 443-465). Springer Netherlands.
- Lawrence Thomas, B., & Roy, S. (2006). Institutions and Institutional work [w:] Stewart R. Clegg, Cynthia Hardy, Thomas B. Lawrence, Walter R. Nord, red.
- Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.
- Losada, H., Vargas, J. M., Cortés, J., Luna, L., & Alemán, V. (2015). Public policies affecting the development of urban agriculture in Mexico City. *Livestock Research for Rural Development*, 27, 163.
- Lovell, S.T. (2010). Multifunctional Urban Agriculture for Sustainable Land Use Planning in the United States. *Sustainability*, 2,2499-2522; doi:10.3390/su2082499.
- Abila, R., Ojwang, W., Othina, A., Lwenya, C., Oketch, R., & Okeyo, R. (2013). Using ICT for fish marketing: the EFMIS model in Kenya. *Food Chain*, 3(1), 48-63.
- Mahbubur Meenar, Alfonso Morales & Leonard Bonarek (2017) Regulatory Practices of Urban Planning
- Maidin, A. J., & Ali, B. B. M. (2009). Powers of the local authority in regulating land planning and development control: whither control. *Planning Malaysia*, 7.
- Makaya, E., & Todzwo, V. (2019). Impact of Urban Farming on Environmental Sustainability: Institutional Coordination Dissonance. *International Journal of Environmental Science and Society*, 1(1).
- Malamis S., Katsou, E., Inglezakis V.J., Kershaw S., Venetis D., Folini S. (2016). Modelling <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/von-thunen-model>
- Marsden, G., & Groer, S. (2016). Do institutional structures matter? A comparative analysis of urban carbon management policies in the UK and Germany. *Journal of transport*



- geography*, 51, 170-179.
- Martellozzo, F. E., Landry, J. S., Plouffe, D., Seufert, V., Rowhani, P., & Ramankutty, N. (2014). Urban agriculture: a global analysis of the space constraint to meet urban vegetable demand. *Environmental Research Letters*, 9(6), 064025.
- Martinez, S. (2010). *Local food systems; concepts, impacts, and issues*. Diane Publishing.
- Masson-Minock, M., & Stockmann, D. (2010). Creating a legal framework for urban agriculture: Lessons from Flint, Michigan. *Journal of Agriculture, Food Systems, and Community Development*, 1(2), 91-104.
- Mativo, J. M. (2015). *The role of law in urban planning in Kenya: Towards norms of good urban governance* (Doctoral dissertation).
- Mbago, M., Ntayi, J. M., & Muhwezi, M. (2016). Compliance to acts, rules and regulations: Evidence from Sub-Saharan Africa. *Journal of Public Procurement*.
- McClintock, N., & Simpson, M. (2018). Stacking functions: identifying motivational frames guiding urban agriculture organizations and businesses in the United States and Canada. *Agriculture and Human Values*, 35(1), 19-39.
- McGinnis, M. D. (2000). *Polycentric games and institutions: readings from the workshop in political theory and policy analysis*. University of Michigan Press.
- Meenar, M., Morales, A. and Bonarek, L. (2017). Regulatory Practices of Urban Agriculture: A Connection to Planning and Policy. *Journal of the American Planning Association*, 83(4), 389 – 403.
- Mentes, Y., & Aslan, F. (2021). Strategies for Urban Agriculture Regulations in Turkey.
- Miles K. Light, Boumbakare Pierre Celestin and Gerold Valentin (2019). *Study on the Implementation of a Tax Regime for Agriculture in Rwanda. Country Experience Review and Policy Options for Agricultural Taxation*
- Milewska, A. J., Citko, D., Jankowska, D., Milewski, R., Konończuk, K., Więsak, T., ... & Milewski, R. (2018). The use of log-linear analysis for pregnancy prediction. *Studies in Logic, Grammar and Rhetoric*, 56(1), 7-18.
- Mintzberg, H. (1987). The strategy concept I: Five Ps for strategy. *California management review*, 30(1), 11-24.
- Mireri, C. (2005). Challenges Facing the Conservation of Lake Naivasha, Kenya.
- Phil, C. M. (2013). Assessment of the contribution of urban agriculture to employment, income and food security in Kenya: a case of Kisumu municipality. *African Journal of Agricultural Research*, 8(23), 2884-2896.
- Mogk, J. E., Wiatkowski, S., & Weindorf, M. J. (2010). Promoting urban agriculture as an alternative land use for vacant properties in the city of Detroit: Benefits, problems and proposals for a regulatory framework for successful land use integration. *Wayne L. Rev.*, 56, 1521.
- Idris, M., & Mohammed, A. (2017). Route for sustainable development in Ethiopia: Opportunities and braves of good governance. *African Journal of Political Science and International Relations*, 11(6), 150-161.
- Mok, H. F., Williamson, V. G., Grove, J. R., Burry, K., Barker, S. F., & Hamilton, A. J. (2014). Strawberry fields forever? Urban agriculture in developed countries: a review. *Agronomy for sustainable development*, 34(1), 21-43.
- Mosha, A. C. (2015). Urban agriculture in Botswana. *Commonwealth Journal of Local Governance*, (18), 48-67.
- Mougeot, L. J. (2006). *Growing better cities: Urban agriculture for sustainable development*.

## IDRC.

- Mubvami, T., Mushamba, S., & De Zeeuw, H. (2006). Integration of agriculture in urban land use planning. *Cities Farming for the Future: Urban Agriculture for Green and Productive Cities. RUAFA, IIRR and IDRC, Silang, the Philippines*, 54-74.
- Mugenda, O. M., & Mugenda, A. G. (1999). *Research methods: Quantitative and qualitative approaches*. Acts press.
- Muriithi, G. M. (2011). *Factors affecting adoption of urban agricultural interventions among HIV and Aids affected households in Nakuru Municipality, Kenya* (Doctoral dissertation, Egerton University).
- Nabutola, W. L. (2012). National Urban Development Policy (NUDP) making process: the Kenyan way: big challenges and some opportunities. *Knowing to manage the territory, protect the environment, evaluate the cultural heritage*.
- Nchanji, E. B. (2017). Sustainable urban agriculture in Ghana: what governance system works?. *Sustainability*, 9(11), 2090.
- Nelson, R. R., & Nelson, K. (2002). Technology, institutions, and innovation systems. *Research policy*, 31(2), 265-272.
- Nelson, R. R., & Nelson, K. (2002). Technology, institutions, and innovation systems. *Research policy*, 31(2), 265-272.
- North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge university press.
- North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge university press.
- Ntayi, J. M., Ngoboka, P., Mutebi, H., & Sitenda, G. (2012). Social value orientation and regulatory compliance in Ugandan public procurement. *International Journal of Social Economics*.
- Obange, N., & Wagah, G. G. (2019). Land tenure challenges in Kisumu City, Kenya.
- Ocasio, W., & Gai, S. L. (2020). Institutions: Everywhere but not everything. *Journal of Management Inquiry*, 29(3), 262-271.
- Ocasio, W., Thornton, P. H., & Lounsbury, M. (2017). Advances to the institutional logics perspective. In *The Sage handbook of organizational institutionalism* (pp. 509-531). SAGE Publishing.
- Ogendi, M. N., Mukundi, J. B., & Masinde, P. W. (2014). Type and distribution of urban and peri-urban agriculture production systems in Nairobi County, Kenya.
- Adeoti, A. I., Cofie, O., & Oladele, O. I. (2012). Gender analysis of the contribution of urban agriculture to sustainable livelihoods in Accra, Ghana. *Journal of Sustainable Agriculture*, 36(2), 236-248.
- Oluwasey, O. B. (2019). Assessment of physical planning administration in Nigeria. *J Environ Anal Ecol Stud*, 5(1), 51-470.
- Omollo, W. O. (2020). Compliance with the planning standards in regulating building lines. The Case of Kisii Town, Kenya. *Journal of Settlements and Spatial Planning*, 11(2), 95-111.
- Onaiwu, D. N. (2020). Assessment of Public Compliance with Development Control Regulations in Auchi, Edo State, Nigeria. *The Indonesian Journal of Planning and Development*, 5(2), 78-86.
- Organisation for Economic Co-operation and Development, OECD (2019). Taxation in agriculture. Working Party on Agricultural Policies and Markets. Trade and

Agriculture Directorate Committee for Agriculture

- Orodho, A. J. (2003). Essentials of educational and social science research methods. *Nairobi: masola publishers*, 54, 71-82.
- Orodho, John. (2010). Elements of Education and Social Science Research
- Ostrom, E. (2011). Background on the institutional analysis and development framework. *Policy studies journal*, 39(1), 7-27.
- O'Sullivan, C. A., Bonnett, G. D., McIntyre, C. L., Hochman, Z., & Wasson, A. P. (2019). Strategies to improve the productivity, product diversity and profitability of urban agriculture. *Agricultural Systems*, 174, 133-144.
- Othman, N., Latip, R. A., Ariffin, M. H., & Mohamed, N. (2017). Expectancy in urban farming engagement. *Environment-Behaviour Proceedings Journal*, 2(6), 335.
- Othman, N., Mohammad, S. Z., Malek, N. A., & Razak, M. A. W. A. (2020). Deterrent factors in urban farming participation. *Environment-Behaviour Proceedings Journal*, 5(13), 353-358.
- Palthe, J. (2014). Regulative, normative, and cognitive elements of organizations: Implications for managing change. *Management and organizational studies*, 1(2), 59-66.
- Panagopoulos, T., Jankovska, I., & DAN, M. B. (2018). URBAN GREEN INFRASTRUCTURE: THE ROLE OF URBAN AGRICULTURE IN CITY RESILIENCE. *Urbanism. Architecture. Constructions/Urbanism. Arhitectura. Constructii*, 9(1).
- Parashina, I. K. (2018). *Institutional Challenges for Sustainable Management of Urban Areas in Kenya: a Case Study of Kajiado County* (Doctoral dissertation, University of Nairobi).
- Paül, V., & McKenzie, F. H. (2013). Peri-urban farmland conservation and development of alternative food networks: Insights from a case-study area in metropolitan Barcelona (Catalonia, Spain). *Land use policy*, 30(1), 94-105.
- Peerzado, M. B., Magsi, H., & Sheikh, M. J. (2019). Land use conflicts and urban sprawl: Conversion of agriculture lands into urbanization in Hyderabad, Pakistan. *Journal of the Saudi Society of Agricultural Sciences*, 18(4), 423-428.
- Pelletier, N., & Tyedmers, P. (2010). Forecasting potential global environmental costs of livestock production 2000–2050. *Proceedings of the National Academy of Sciences*, 107(43), 18371-18374.
- Polit, D. F., & Beck, C. T. (2006). The content validity index: are you sure you know what's being reported? Critique and recommendations. *Research in nursing & health*, 29(5), 489-497.
- Quick, K. S., & Bryson, J. M. (2022). Public participation. In *Handbook on theories of governance*. Edward Elgar Publishing.
- Samar, R. (2017). Research Design and Methods: A Systematic Review of Research Paradigms, Sampling Issues and Instrument Development. *International Journal of Economics and Management Sciences*, 6(2), 2-5.
- Rahman, A. N. A., & Abdullah, Y. A. (2016). Theorizing the Concept of Urban Public Transportation Institutional Framework in Malaysia. In *MATEC Web of Conferences* (Vol. 66, p. 00043). EDP Sciences.
- Rodríguez- Pose, A. (2020). Institutions and the fortunes of territories. *Regional Science Policy & Practice*, 12(3), 371-386.
- Republic of, Kenya (2022). Annual Development Plan FY 2022-2023. County Government of

Uashin Gishu

- Reynolds, K. A. (2011). Expanding technical assistance for urban agriculture: Best practices for extension services in California and beyond. *Journal of Agriculture, Food Systems, and Community Development*, 1(3), 197-216.
- Rezai, G., Shamsudin, M. N., Mohamed, Z., & Sharifuddin, J. (2014). Factor influencing public participation in urban agriculture in Malaysia. *Malay*, 256, 40.
- Sahasranaman, M. (2016). Future of urban agriculture in India. *Institute for Resource Analysis and Policy*, 2(10), 1-24.
- Salau, E. S., & Attah, A. J. (2012). A socio-economic analysis of urban agriculture in Nasarawa State, Nigeria. *PAT*, 8(1), 17-29.
- Sanyé-Mengual, E. (2015). COST Action Urban Agriculture Europe: Freelance STSM: Stakeholders' acceptance, governance and power relations in innovative forms of urban agriculture. *Agron Sustain Dev*, 35, 1477-1488.
- Saprykina, N. A. (2022, April). Environmental strategies for the formation of urban agriculture in the context of the transition to sustainable development. In IOP Conference Series: Earth and Environmental Science (Vol. 1010, No. 1, p. 012064). IOP Publishing. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1010, No. 1, p. 012064). IOP Publishing.
- Sarker, A. H., Bornman, J. F., & Marinova, D. (2019). A framework for integrating agriculture in urban sustainability in Australia. *Urban Science*, 3(2), 50.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students*. Pearson education.
- Schmidt, S., Magigi, W., & Godfrey, B. (2015). The organization of urban agriculture: Farmer associations and urbanization in Tanzania. *Cities*, 42, 153-159.
- Schwandt, T. A., & Halpern, E. S. (1988). *Linking auditing and metaevaluation: Enhancing quality in applied research*. Sage Publications, Inc.
- Scott, W. R. (2004). Institutional theory. *Encyclopedia of social theory*, 11, 408-414.
- Scott, W. R. (1995). *Institutions and organizations* (Vol. 2). Thousand Oaks, CA: Sage.
- Seyfang, G. (2004). Consuming values and contested cultures: a critical analysis of the UK strategy for sustainable consumption and production. *Review of social economy*, 62(3), 323-338.
- Siegner, A., Sowerwine, J., & Acey, C. (2018). Does urban agriculture improve food security? Examining the nexus of food access and distribution of urban produced foods in the United States: A systematic review. *Sustainability*, 10(9), 2988.
- Skar, S. L. G., Pineda-Martos, R., Timpe, A., Pölling, B., Bohn, K., Külvik, M., ... & Junge, R. (2020). Urban agriculture as a keystone contribution towards securing sustainable and healthy development for cities in the future. *Blue-Green Systems*, 2(1), 1-27.
- Smit, W. (2016). Urban governance and urban food systems in Africa: Examining the linkages. *Cities*, 58, 80-86.
- Songa, P., Rumohr, J., & Musota, R. (2015). Policy and institutional framework considerations in the implementation of catchment-based water resources management in Uganda: highlights from the River Rwizi catchment. *WIT Transactions on Ecology and the Environment*, 196, 15-26.
- Stojanović, I., Ateljević, J., & Stević, R. S. (2016). Good governance as a tool of sustainable development. *European Journal of Sustainable Development*, 5(4), 558-558.
- Thibert, J. (2012). Making local planning work for urban agriculture in the North American

- context: A view from the ground. *Journal of Planning Education and Research*, 32(3), 349-357.
- Thomaier, S., Specht, K., Henckel, D., Dierich, A., Siebert, R., Freisinger, U. B., & Sawicka, M. (2015). Farming in and on urban buildings: Present practice and specific novelties of Zero-Acreage Farming (ZFarming). *Renewable Agriculture and Food Systems*, 30(1), 43-54.
- Tiraieyari, N., Karami, R., Ricard, R. M., & Badsar, M. (2019). Influences on the implementation of community urban agriculture: Insights from agricultural professionals. *Sustainability*, 11(5), 1422.
- Tornaghi, C. (2014). Critical geography of urban agriculture. *Progress in Human Geography*, 38(4), 551-567.. *Prog Hum Geogr*. doi: 10.1177/030 Taylor, M. (2013). Institutional Structures of Regulation. In *Handbook of Safeguarding Global Financial Stability* (pp. 473–480). <https://doi.org/10.1016/B978-0-12-397875-2.00026-X> 9132513512542
- Tugwell, C. (2012). *An Investigation into the Socio-Economic Factors that Promote Urban Agriculture in Zimbabwe: The Case of Residents of Sakubva Chisamba Singles in Mutare City* (Doctoral dissertation, University of Zimbabwe).
- UN Habitat. (2018). *Urban planning for city leaders. A handbook for Kenya*. Retrieved from <http://wuf9.org/programme/urban-library/urban-planning-for-city-leaders-a-handbook>-Retrieved from <http://wuf9.org/programme/urban-library/urban-planning-for-city-leaders-a-handbook>
- UN-Habitat (2017). *National urban policy: sub-Saharan Africa report*. United Nations Human Settlements Programme. UNON Publishing Services Section, Nairobi
- United Nations (2011). *World Population Prospects: The 2010 Revision* New York: United Nations. Department of Economic and Social Affairs, Population Division)
- Viet, L-H., Ngan, N.V.C., Hoang, N.X., Quynh, D.N., Songkasiri, W., Commins, T. et al (2009). Legal and institutional framework for solid waste management in Vietnam. *As. J. Energy Env*, 10(04), 261-272.
- Wahab, B., Popoola, A., & Magidimisha, H. (2018). Access to urban agricultural land in Ibadan, Nigeria. *Planning Malaysia*, 16.. Access to urban agricultural land in
- Walsh, C. (2012). Spatial planning and territorial governance: managing urban development in a rapid growth context. *Urban Research & Practice*, 5(1), 44-61.
- Wapwera, S. D., & Egbu, C. O. (2013). Planning authorities: A review of roles, functions and responsibilities in Jos Metropolis, Nigeria. *The Built and Human Environment Review*, 6(1), 30-45.
- Wapwera, S. D., Mallo, D. M., & Jiriko, G. J. (2015). Institutional framework and constraints in the urban and regional planning system in Jos Metropolis, Nigeria. *Journal of Geography and regional Planning*, 8(10), 244-260.
- Wapwera, S. D. (2014). *Spatial planning framework for urban development and management in jos metropolis Nigeria*. University of Salford (United Kingdom). *urban development and management*
- Watson, V. (2016). Locating planning in the New Urban Agenda of the urban sustainable development goal. *Planning Theory*, 15(4), 435-448.
- Weske, U., Boselie, P., Van Rensen, E. L., & Schneider, M. M. (2018). Using regulatory enforcement theory to explain compliance with quality and patient safety regulations: the case of internal audits. *BMC health services research*, 18(1), 1-6.

- Yang, Y., Zhang, Y., & Huang, S. (2020). Urban Agriculture Oriented Community Planning and Spatial Modeling in Chinese Cities. *Sustainability*, 12(20), 8735.
- Yego, W. C. (2011). *Analysis of urban agriculture as a tool for increasing food security within Eldoret town, Uasin Gishu County, Kenya.*



Veges, onions etc  Cereals (maize, rice etc)  Fruits (mangoes, passion fruits,  others) please specify.....

17. What is the main constraint facing you in your urban faming activities?  Non-Supportive government policies/Laws  Shortage of land  Lack of credit  Inadequate  Knowledge and skills  Water shortage/Inadequacy

18. Have you ever attended any capacity building workshop/seminar on agriculture or planning issue?  Yes  No

19. Where do yo get the main support / facilitation or servieces for your UA activities?  Livestock department  Agriculture department  Farmer to farmer  Planning department

**Section C: Socio-economic & Environmental Status of Urban Agriculture**

The following statements relate to socio-economic & environmental status of Urban Agriculture in your town. Using Yes (1), No (2) and Not sure/I do not know (3), please respond to the following statements concerning your views on the practice of urban agriculture in your town

<b>The Socio-economic &amp; Environmental Status of Urban Agriculture</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Social dimension</b>			
My main objective of participating in UA is to improve my food nutrition			
UA provides continuous supply of fresh and healthy produce to my household			
UA supplements my food supply to my household			
<b>Economic dimension</b>			
My participation in UA has increased my income over the years			
Poultry keeping results in high income			
UA generates self-employment to my household			
<b>Environmental dimension</b>			
Reusing of greywater in my farm reduces discharges of waste water on open spaces/roadsides thus protecting environment			
Tree crops planted on my compound provide shades hence creating conducive micro-climate around my house.			



### **Section D: Effect of Planning legislative framework on Urban Agriculture**

The following statements relate to the effect of planning regulation on urban agriculture as a development practice or activity in your town. Using Yes (1), No (2), Not sure/I don't know (3), please respond to the statements regarding how planning legislative frameworks have affected your urban agriculture activities

<b>Effect of Planning legislative frameworks Frameworks on UA</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Planning policies</b>			
Policies on national land policies are supportive in urban agriculture			
<b>Planning laws/regulations</b>			
Regulations on land use designations/allotment of open spaces benefits UA activities			
Livestock keeping in town is prohibited by town authorities			
Zoning Ordinance permits crop cultivation within in plots in my town			
Town Planning Department have an Urban Agriculture Unit /office			
Awareness of Physical and Land Use planning law is high in my town			
Municipal by- laws regulating UA are enforced strictly in town			
<b>Law enforcement and Compliance</b>			
Tax on UA produce have been fair to farmers			
Licensing fee charged on UA business is favourable			
Penalties imposed for non-compliance to UA regulations are fair			

### **Section E: Contribution of Planning Strategies, Plans and Programmes to Urban Agriculture**

The following statements relate to contribution of Planning Strategies, Plans and Programmes to Urban Agriculture as an activity in your town. Using Yes (1), No (2), Not sure/I don't know, please respond to the statements concerning how planning strategies, plans and programmes have contributed to your urban agriculture activities

<b>Contribution of Planning Atrategies, Plans and Programmes to Urban Agriculture</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Planning Strategies, plans &amp; programmes</b>			
Rooftop and window gardening forms part of town beautification in urban plans			
Plans of estates and residential buildings with special zones/spaces for gardening			
Gardening in open space/road reserves is allowed within towns			
<b>Public Participation in planning</b>			
I am usually involved in public participation during development & review of city plans and programmes			

## Appendix 2: Focus Group Discussions Guide

This discussions guide is meant to solicit information related to socio-economic & environmental status of urban agriculture, effect of planning legislative framework on urban agriculture and contribution of planning strategies, plans and programmes to urban agriculture in Eldoret, Kakamega and Kisumu towns. The questions presented for discussions includes the following:

### **I. Socio-Economic & Environmental Status of Urban Agriculture**

1. Does participation in UA activities improve household nutrition and general livelihood, and in which ways?

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2. How does participation in urban agriculture activities improve your households' income including self-employment status?

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3. How does participation in urban agriculture activities improve your environment with regards to recycling of vegetable waste, reuse of grey water, usage of livestock manure, and greening of home environs?

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### **II. Effect of Planning legislative framework on Urban Agriculture**

1. How has the following legal conditions contained in the town plans affected urban agriculture in your town:

- Zoning ordinances?

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- Land use designations or allotment of open spaces?

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---

- Backyard livestock farming allowed by bylaws?

---

---

-Limited regulations for agricultural production practices?

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2. How does law enforcement and compliance stipulated in urban plans affect urban farming under the following?

-Restrictions on the sale of agricultural products?

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-Exemptions offered for specific agricultural productions such as poultry, vegetables and fruits?

---

---

-Conducive compliance enforcement of environment standards?

---

---

3. Regarding taxation and penalties, how has the following affected your urban agriculture practice?

-Providing tax abatement to urban farmers?

---

---

- Licensing fee for conducting urban agriculture?

---

---

-Penalties imposed for non-compliance with regulations?

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### **III. Contribution of Planning Strategies, Plans and Programmes to Urban Agriculture**

1. How does planning strategies, plans and programmes contribute to to urban agriculture such as domestication of livestock in the estates, gardening in open spaces within towns, rooftop and window gardening?

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---

2. With regards to implementation of town plans, are stakeholders like urban farmers adequately involved in public participation during development & review of plans and their buy-in sought before roll-out of such plans?

- Is periodic evaluation of plan implementation done with involvement of urban farmers, and does recommendations of farmers included in improvements made to plans?

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3. Does the town plans include the following and if so, how do the same affect your urban farming activities:

- Reservation of open fertile zones for urban agriculture practices?

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- Creation of special places for collection of agriculture waste?

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---

- Provisions that estates and residential building must have special zones for gardening?

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---

- Inclusion of urban agriculture conditions in building codes?

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### Appendix 3: Key Informants Guide

This discussions guide is meant to solicit information related to socio-economic & environmental status of urban agriculture, effect of planning legislative framework on urban agriculture and contribution of planning strategies, plans and programmes to urban agriculture in Eldoret, Kakamega and Kisumu towns. The questions presented for discussions includes the following:

#### I. Socio-economic & environmental status of urban agriculture

1. Does participation in UA activities improve household nutrition and general livelihood, and in which ways?

---

---

---

2. How does participation in urban agriculture activities improve your households' income including self-employment status?

---

---

3. How does participation in urban agriculture activities improve your environment with regards to recycling of vegetable waste, reuse of grey water, usage of livestock manure, and greening of home environs?

---

---

#### II. Effect of Planning legislative framework on Urban Agriculture

1. How has the following legal conditions contained in the town plans affected urban agriculture in your town:

- Zoning ordinances?

---

---

- Land use designations or allotment of open spaces?

---

---

- Backyard livestock farming allowed by bylaws?

---

---

-Limited regulations for agricultural production practices?

---

---

2. How does law enforcement and compliance stipulated in urban plans affect urban farming under the following?

-Restrictions on the sale of agricultural products?

---

---

-Exemptions offered for specific agricultural productions such as poultry, vegetables and fruits?

---

---

-Conducive compliance enforcement of environment standards?

---

---

3. Regarding taxation and penalties, how has the following affected your urban agriculture practice?

-Providing tax abatement to urban farmers?

---

---

- Licensing fee for conducting urban agriculture?

---

---

-Penalties imposed for non-compliance with regulations?

---

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## **II. Contribution of Planning Strategies, Plans and Programmes to Urban Agriculture**

1. How does strategies, plans & programmes contribute to urban agriculture such as domestication of livestock in the estates, gardening in open spaces within towns, rooftop and window gardening?

---

---

2. With regards to implementation of strategies, plans & programmes, are stakeholders like urban farmers get involved in public participation during development and review of city/town plans and their buy-in sought before roll-out of such plans?

-

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---

---

3. Does the town plans include the following and if so, how do the same affect your urban farming activities:

- Reservation of open fertile zones for urban agriculture practices?

---

---

- Creation of special places for collection of agriculture waste?

---

---

- Provisions that estates and residential building must have special zones for gardening?

---

---

- Inclusion of urban agriculture conditions in building codes?

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Appendix 4: Document Analysis Guide

Item	Adequate	Inadequate	None	Remark
<b>3) Effect of Planning legislative framework and Urban Agriculture</b>				
(i) Planning regulations				
(ii) Law enforcement and compliance				
(iii) Taxation and penalties				
<b>1) Contribution of Strategies, plans a&amp; programmes to Urban Agriculture</b>				
(i) Planning Strategies (Methods)				
(ii) Implementation of plans				
(iii) Spatial planning				



**Appendix 5: Schedule for Observation**

*The researcher will take notes on the following observations;*

- Serial No :.....
- Date of interview :.....
- 1. Name of County :.....
- 2. Name of Sub County :.....
- 4. Estate (Town residence) :.....
- 5. Sex { } Male { } Female
- 6. Crops grown:
  - Does the farmer grow crops?
  - What crops are grown in the farm?
  - What acreage is under specific crops?
  - What is the general condition of the crop grown?
- 7. Livestock Kept
  - Does the farmer keep livestock?
  - What livestock are kept in the farm?
  - What is the size of the herd and composition?
  - What is the general condition of the livestock?
- 8. Any other challenge in the farm

### Appendix 6: Participants of Focus Group Discussion

<b>Kisumu - Urban farmer group</b>	<b>Female</b>	<b>Male</b>	<b>Total membership</b>
Tunnel women group	1	1	2
Kondele Traders Development	0	1	1
Tich Tek women group	0	1	1
Kinda Eteko women group	1	0	1
Kosawo women group	0	2	2
Lowa Milimani group	1	0	1
<b>Total</b>	3	4	8
<b>Kakamega Town</b>			
Jua Kali Pamoja SHG	1	0	1
Scheme Sonko SHG	1	0	1
Sichirayi Nyota Youth Group	0	1	1
Bukhonyani Welfare Group	0	1	1
Kibali Support Group	0	1	1
Muleya Self Help Group	1	1	2
Kakamega Local Poultry Development Group	1	0	1
<b>Total</b>	4	4	8
<b>Eldoret Town</b>			
Nest Farmers pambazuka women group	1	0	1
Kipkenyo jubilee	0	1	1
Organic farmers group	0	1	1
Upendo S.H.group	1	1	2
Tumaini women group	1	0	1
Exodus chebarus group	0	1	1
Jubilee tuiyoS.H.gro	1	0	1
<b>Total</b>	4	4	8

## Appendix 7: Research Permit



### MASENO UNIVERSITY ETHICS REVIEW COMMITTEE

Tel: +254 057 351 622 Ext: 3050  
Fax: +254 057 351 221

Private Bag – 40105, Maseno, Kenya  
Email: muerc-secretariat@maseno.ac.ke

FROM: Secretary - MUERC

DATE: 5<sup>th</sup> May, 2017

TO: Isaac Otieno Dawo  
! G/PHD/00033/2010  
Department of Urban and Regional Planning  
School of Planning and Architecture  
Maseno University  
P. O. Box, Private Bag, Maseno, Kenya

REF: MSU/DRP/MUERC/00340/16

RE: Institutional Framework for Urban Agriculture in Kenya: A Paradigm Shift in Urban Planning. Proposal Reference Number MSU/DRP/MUERC/00340/16

This is to inform you that the Maseno University Ethics Review Committee (MUERC) determined that the ethics issues raised at the initial review were adequately addressed in the revised proposal. Consequently, the study is granted approval for implementation effective this 5<sup>th</sup> day of May, 2017 for a period of one (1) year.

Please note that authorization to conduct this study will automatically expire on 4<sup>th</sup> May, 2018. If you plan to continue with the study beyond this date, please submit an application for continuation approval to the MUERC Secretariat by 5<sup>th</sup> April, 2018.

Approval for continuation of the study will be subject to successful submission of an annual progress report that is to reach the MUERC Secretariat by 5<sup>th</sup> April, 2018.

Please note that any unanticipated problems resulting from the conduct of this study must be reported to MUERC. You are required to submit any proposed changes to this study to MUERC for review and approval prior to initiation. Please advise MUERC when the study is completed or discontinued.

Thank you.

  
Dr. Bonuke Anyona,  
Secretary,  
Maseno University Ethics Review Committee



Cc: Chairman,  
Maseno University Ethics Review Committee.

MASENO UNIVERSITY IS ISO 5001:2008 CERTIFIED

