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Planning Policy Frameworks and Urban Agriculture Practices in Western Kenya

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Abstract:
Urban Agriculture (UA) has largely been embraced globally ostensibly for market as well as food for family consumption. The increased urbanization culminating into rise in poverty, food insecurity and malnutrition has necessitated UA as a critical option for livelihood and a source of income to many families. Despite of this fact, UA practices are often performed without formal recognition and structural support from municipal policies and legislation. The general objective of the study was to investigate the influence of planning policy frameworks on urban agriculture practices in Eldoret, Kakamega and Kisumu towns. The specific objectives were to investigate the influence of economic; social, and environmental aspects of urban planning. Cross sectional survey design was adopted on a target population of 440 urban farmers (Eldoret: N=137; Kakamega: N=145; Kisumu: N=158) identified through the assistance of County Agricultural officers in the three towns. A sample size of 205 respondents (Eldoret=63; Kakamega=68; Kisumu=74) was obtained using stratified technique. Questionnaire and Key Informant interviews were used for data collection. Inferential statistics using Pearson Product Moment Correlation Coefficient was used in data analysis. It found that economic influence of urban planning legislation declined, social influence increased only in Kakamega while environmental influence doubled in all towns during the period after the devolved system of government. Findings also revealed that the planning policy legislations had no major influence on planning, promotion and regulation of urban agriculture, except for minor changes, although a significant (n=205; r =.389; p < 0.05) low positive correlation relationship with urban agriculture practice existed, indicating more proactive urban planning legislations would be associated to more involvement in urban agriculture practice.

Keywords: Urban agriculture, economic influence, social influence, planning policy legislations, eldoret, kakamega and kisumu, food security

1. Introduction

The contribution of Urban Agriculture (UA) to urban food and nutrition security has recently become a subject of attention for policy makers and researchers alike. The persistent malnutrition and hunger in a rapidly urbanising world presents UA as an opportune strategy for resolving food insecurity menace (Thornton, 2012). According to Stander (2018), the world's urban population exceeded that of its rural counterpart for the first time in modern history on May 7th 2007, a day referred to by some as 'Mayday 23,' marking the beginning of a new human settlement demography. Although Food and Agricultural Organization and the World Bank (FAO & WB, 2008) acknowledge that UA has numerous benefits, the inclusion of this instrument within urban planning policy legislations is neglected, leaving a gap in the process of working towards more sustainable development approaches, especially in terms of poverty alleviation and food security (Faling, 2012; Resource centres on Urban Agriculture and Food security [RUAF, 2009]).

Urban planning aims at resolving the conflicting demands of users within a continually changing urban environment with limited resources such as limited space (Stander, 2018). On the other hand, Cilliers et al. (2014) contend that urban planning seeks to bring about an organised, efficient and sustainable landscape for the community to live and work in. Historically, agricultural policies have supported industrial and intensive production method farming, leading to increased opportunity for centralised control of urban food chains and disregard for the ecological impacts of planning for current food chains and production networks (Florin & Renting, 2015). The role of UA as potential instrument of sustainability was overlooked by municipalities and solutions for their related issues were primarily sought through generic, broad scale strategies; such as increased urban inclusivity (Parnell, 2016:534). Recent policy and agenda changes, however, take a "zoomed-in" approach to urban development, with more specific strategies (Parnell, 2016). These

strategies are focused on achieving sustainable development within each of the three sectors of development: social, economic and environmental development objectives (Mattheisen, 2015; COGTA, 2016). However, how UA planning policy and legislations have influenced social, economic and environmental objectives for urban populations seem to have received limited documentation.

1.1. Statement of the Problem

While there is a growing awareness of urban farming and agricultural initiatives globally, food security and production within cities of developing countries experiencing rapid urbanisation rates, will become stressed. This is also true in developing countries including Kenya, where the need for sustainable planning methods are emphasised, due to an urban population that makes up more than two thirds of the total population and is estimated to surpass the three-quarters mark by 2050. The benefits of UA are numerous, however, but the inclusion of this instrument within urban planning policies is neglected, leaving a gap in the process of working towards more sustainable development approaches, especially in terms of poverty alleviation and food security. While several optimists suggest that these initiatives can be of commercial value to a city or company, there is a controversy whether these urban farming initiatives would contribute to the overall poverty upliftment and sustainability goals in cities as opposed to just benefiting a single social group, encouraging urban exclusivity. Considering the above, the question remains if urban farming could be incorporated into spatial planning practices and policies as an instrument to enhance sustainable urban development for everyone?

1.2. Objectives
- What is the economic influence of planning policy and legislations on urban agriculture practices in Kenya?
- What is the social Influence of planning policy and legislations on urban agriculture practices in Kenya?
- What is the environmental influence of planning policy and legislations on urban agriculture practices in Kenya?

2. Materials and Methods

2.1. Research Design

The study was conducted through a cross-sectional survey research design. The study aimed at collecting information from respondents on their views, attitude and opinions in relation to establishment of institutional framework for planning, promotion and regulation of the practice of urban agriculture in the three study towns of Kisumu, Kakamega and Eldoret.

2.2. Target Population and Sample Size

The study population comprised individual urban farmers practising urban agriculture and the relevant officials of county government institutions involved in urban agriculture management. This population was drawn from urban settlements within the three selected towns, amounting to of four hundred and forty (440) urban farmers. The study employed purposive and stratified random sampling techniques to select the sample. Stratified random sampling was used to determine the sample size per town for household interviews. A formula was used to identify the total sample size for household interviews in the three towns. Therefore, a total sample size for the whole study was calculated using Fisher formula (Mugenda & 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). If there is no reasonable estimate available of the proportion in the target population assumed to have the characteristics of interest, then use 50 percent is used as recommended by Fisher *et al*

q = 1.0 –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 10,000, the formula below was adopted;

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

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

$n_f = 384/1.872$

$n_f = 205$

Town	Study population	Proportionate Sample per Town	Total Sample size per Town	Study Population Sampled			
				Active	% Proportion of sample taken	Non-Active	% Proportion of sample taken
Kisumu	158	0.36	74	54	26	20	10
Kakamega	145	0.33	68	58	28	10	5
Eldoret	137	0.31	63	50	24	13	6
Total	440		205	162		43	

Table 1: Total Sample Size for the Study Areas

After the calculations, simple random sampling method was used to select a total of two hundred and five (205) from the already identified list of four hundred and forty (440) urban farmers. As a result, the total sample size for each town was such that; Kisumu had seventy four (74), Kakamega, sixty eight (68) and Eldoret town had sixty three (63) respondents respectively (Table 1).

2.3. Data Collection Instruments

The main data collection methods used comprised interview questionnaire, observation, Key Informant Interview (KII) and focus group discussions (FGDs). The Household interviews (HHI) method used a semi-structured questionnaire to collect data from two hundred and five (205) respondents at the household level. On the other hand, the Key Informant Interviews (KIIs) method used interview schedule to collect both qualitative. The interview schedule was used to collect information from a total of twelve (12) key informants which included, three (3) chief officers for agriculture and livestock, three (3) county directors for agriculture, three (3) county directors of livestock and three (3) town manager or municipal manager in the three towns. Focus group discussion (FGD) method was used to collect data from a total of twenty four (24) participants, mainly from three (3) urban farmer groups; each consisting of eight (8) members. The study also used unstructured observation method which involves the observer taking a position of an onlooker, while at the same time collecting data in the form of descriptive accounts.

2.4. Data Analysis

Qualitative data from FGD and KIIs was subjected to content analysis to yield themes corresponding with the study objectives, while quantitative data collected from household interviews was analysed using Statistical Package for Social Scientists (SPSS) software version 22 which also yielded both descriptive and inferential statistics.

3. Findings and Discussions

The objective of the study was to establish the influence of urban planning legislations on practice of urban agriculture. The economic, social and environmental influence of planning policy legislations were evaluated based on a weighted average. The MCA approach is a stepwise technique with three key phases; First, weights were assigned to aspects of influence, average weights per influence was computed and then finally scoring and ranking of assessment indicators per influence was done in each town.

3.1. Economic Influence

The economic influence of newly enacted urban planning legislations on urban agriculture was ascertained by assessing the two variables of livelihood support, and law enforcement and compliance through use of assessment indicators which included food security, income provision, and taxation and penalties. The study revealed that, before the devolved system of county government in the year 2012, economic influence had a similar score of 0.88, in all the three towns but after the establishment of devolved system of county government, the influence dropped in all towns to 0.68, (Table 2). It was observed that, there was a trend indicating that the total economic influence of urban planning legislations was greater before than the period after the devolved system of government.

3.2. Livelihood Support

In terms of livelihood support to urban agriculture, there was a drop in total weighted score from 0.88 prior to the devolved system to 0.86 after the devolved system, (Table 2). The livelihood support was determined by two criteria factors namely; food security and income provision.

Criteria	Wt.	Economic Influence Scenario - Before Year 2012						Economic Influence Scenario - After Year 2012					
		Kisumu		Kakamega		Eldoret		Kisumu		Kakamega		Eldoret	
		Raw Score	Wt. score	Raw Score	Wt. score	Raw Score	Wt. score	Raw Score	Wt. score	Raw Score	Wt. score	Raw Score	Wt. score
Livelihood Support													
Food security	0.3	++2	0.6	++2	0.6	++2	0.6	+1	0.3	+1	0.3	+1	0.3
Income provision	0.28	+1	0.28	+1	0.28	+1	0.28	++2	0.56	++2	0.56	++2	0.56
Sub-total	0.58	3	0.88	3	0.88	3	0.88	3	0.86	3	0.86	3	0.86
Rank			1		1		1		1		1		1

Table 2: Multi-Criteria Analysis Matrix for Economic Influence

Key for Magnitude of Influence

- - - (-3) Very negative influence +   (+1) Positive influence
- -   (-2) Moderately negative influence ++   (++2) Moderately positive influence
-      (-1) Negative influence   +++ (+++3) Very positive influence
0   (0)   No influence at all, neither positive nor negative

Table 2 shows results of cross-tabulation analysis of the main objective of farming and main source of livelihoods. Urban farmers, whose main source of livelihood was farming, had income provision as the main objective of farming in Kisumu (58.6%), food provision in Kakamega (66.7%) and Eldoret (64.5%). Those with small scale business as main source of livelihood, most of them had food provision as main objective of farming in Kisumu (52.0%, Kakamega (76.9%) and Eldoret (59.3%). Among those with formal employment, most of them had income provision as main objective of farming in Kisumu (66.7%), food provision in Kakamega (92.3%) and Eldoret (100%).Those who had rental houses as main source of livelihood, most of them had income or food provision as main objective of farming in equal proportions in Kisumu (38.5%) while food provision was the main objective in Kakamega (100%), (Table 3).

Source of Livelihood		Main Objective of Farming				Total
		Provides income	Provides food	Creates self-employment	Reduces urban poverty	
Farming	Kisumu	58.6%	41.4%	0.0%		100.0%
	Kakamega	20.5%	66.7%	12.8%		100.0%
	Eldoret	29.0%	64.5%	6.5%		100.0%
small scale business	Kisumu	40.0%	52.0%	4.0%	4.0%	100.0%
	Kakamega	7.7%	76.9%	15.4%	0.0%	100.0%
	Eldoret	40.7%	59.3%	0.0%	0.0%	100.0%
Formal employment	Kisumu	66.7%	33.3%			100.0%
	Kakamega	7.7%	92.3%			100.0%
	Eldoret	0.0%	100.0%			100.0%
Rental houses	Kisumu	38.5%	38.5%		23.1%	100.0%
	Kakamega	0.0%	100.0%		0.0%	100.0%

Table 3: Main Source of Livelihood by Town and Main Objective of Farming

It was noted that majority of urban farmers with different livelihoods had food provision as the main objective of farming, followed by income provision, and then either income or food. Urban agriculture was being practiced for the twin objectives of income and food provision. Food is a basic need hence where food provision was the main objective, like in Kakamega and Eldoret, the presence of urban poverty, especially among women, could not be farfetched. The finding concurs with that of Yego (2017), which asserted that most farmers practiced mixed farming with 68.2% practicing UA for food while 49.6% mainly for increasing household income. The poverty rate in Kisumu County is 47.8% and in Kakamega the rate is 53% while Eldoret it is 51.3% (CRA, 2011and R.O.K, 2011). The finding also concur with that of Guendel (2002), which was conducted within East African urban centres that revealed urban agriculture as a multi-purpose activity providing food security, income, employment, savings, insurance and social status, provision of higher return per unit of land from livestock compared to crops, flexibility in terms of land use, use of waste resources, provision of a social safety net for the poor and market developments due to urbanization that favour poor urban farmers.

3.3. Food Provision

The study revealed that food security issues remained largely the same before and after the devolved system of county government, but there was a decrease by half (0.3) from the previous influence score of 0.6 when the two scenarios were compared (Table 4). This scenario occurred despite the fact that agriculture is fully devolved function of the county governments and the farm inputs were often supplied to a few farmers. Key informants complained of lack of interest on implementation of efficient extension service delivery by key decision makers in the county, which in turn influenced food

security, as farm input provision was not accompanied by capacity building, after inception of the devolved system. Haysom (2009) noted that the effectiveness and reach of extension services were also constrained by the lack of a structured urban agriculture extension programme and also by restrictions on urban agriculture by the municipal council as well as inappropriate approaches adopted in targeting the farmers. As a consequence, farmers relied mostly on traditional knowledge and skills, and/or informal networks for agricultural information. Desai (2015) concluded that UA has significant positive impact on household food security and nutrition. Participation in urban agriculture significantly closes the gap between the poor and the more affluent citizens particularly increasing the quantities of beans, tubers, legumes and vegetables consumed.

3.4. Income Provision

The findings show that the influence of urban planning legislation on income of urban farmers was similar before and after the devolved system at 0.18 and 0.36 respectively, in all the three towns (Table 4). However, after the devolved system, the score doubled due to more production of surplus agriculture produce for sale by urban farmers. Urban planning legislation had a double influence on income of urban farmers after devolved system as opposed to before. This double influence provided a positive impact to urban poor farmers who were the majority income group in these towns. Further cross tabulation analysis results from household interviews showed that, this double influence was realized due to profitability of urban agriculture. The income level below KES.30000 had majority arguing that urban agriculture was profitable in Kisumu (96.2%) and Eldoret (91.1%, and also very profitable in Kakamega (53.3%). Similarly, income level of KES 31000-40000, asserted that the practice was profitable in Kisumu (85.7%), and Eldoret (100%), and also very profitable in Kakamega (52.4%). Among those with income level KES. 41000-50000, urban farmers maintained it was profitable in Kisumu (100%) and Kakamega (100%) while it was fairly profitable in Eldoret (100%). Majority of urban farmers with income level above 60,0000 all said urban agriculture was profitable in Kisumu (100%), There was a significant relationship between income level and profitability of urban agriculture (X^2 (4, N= 165) = 83.664 ; P=0.000),(Table 4)

Income Level		Profitability of Urban Agriculture			Total
		Very profitable	Profitable	Fairly profitable	
below 30000	Kisumu	3.8%	96.2%	0.0%	100.0%
	Kakamega	53.3%	20.0%	26.7%	100.0%
	Eldoret	1.8%	91.1%	7.1%	100.0%
31000-40000	Kisumu	14.3%	85.7%	0.0%	100.0%
	Kakamega	52.4%	23.8%	23.8%	100.0%
	Eldoret	0.0%	100.0%	0.0%	100.0%
41000-50000	Kisumu		100.0%	0.0%	100.0%
	Kakamega		100.0%	0.0%	100.0%
	Eldoret		0.0%	100.0%	100.0%
above 60000	Kisumu		100.0%		100.0%

Table 4: Income Level by Town and Profitability of Urban Agriculture

Majority of urban farmers argued that urban agriculture was largely very profitable or profitable while the income level KES 41000-50000 maintained it was fairly profitable especially in Eldoret. Similarly, urban farmers in income level below KES 30000 maintained urban agriculture was very profitable, profitable or fairly profitable. Romborah and Foeken (2013) also observed that the majority of residents who are low-income earners making a living mostly from the informal sector often engage in small scale UA. Similarly, Oladele, Olufunke and Adetola (2012) found out that the significant determinants UA income to household income were household size, access to credit, membership of farmers' association, gender, age and farm size.

4. Social Influence

The social influence of urban planning legislations on urban agriculture was assessed by considering the legal status using two assessment criteria indicators; appropriate regulator & legislative framework at county level and land use zoning for urban agriculture. The pre-determined influence weight was distributed among the criteria of each influence based on the subjective judgment of the key informants in each town. Table 5 shows that social influence, assessed through legal status, remained largely the same before the devolved system but generally increased after devolved system, from a score of 0.09 to 0.28 in Kakamega.

Criteria		Social Influence Scenario 1 - Before Year 2012						Social Influence Scenario 2 - After Year 2012					
		Kisumu		Kakamega		Eldoret		Kisumu		Kakamega		Eldoret	
	Wt.	Raw Score	Wt. score	Raw Score	Wt. score	Raw Score	Wt. score	Raw Score	Wt. score	Raw Score	Wt. score	Raw Score	Wt. score
Legal Status													
Legal Recognition	0.05	1	0.05	1	0.05	1	0.05	1	0.05	1	0.05	1	0.05
Appropriate regulatory & legislative framework at county level	0.09	1	0.09	1	0.09	1	0.09	1	0.09	2	0.18	1	0.09
Land use zoning for UA	0.05	1	-0.05	1	-0.05	-1	-0.05	1	0.05	1	0.05	1	0.05
Total Scores	0.19		0.09		0.09		0.09		0.19		0.28		0.19
Rank			1		1		1		2		1		2

Table 5: Multi-Criteria Analysis Matrix for Social Influence

Key for Magnitude of Influence

- - -	(-3)	Very negative influence +	(+1)	Positive influence
- -	(-2)	Moderately negative influence ++	(++2)	Moderately positive influence
-	(-1)	Negative influence +++	(+++3)	Very positive influence
0	(0)	No influence at all, neither positive nor negative		

5. Appropriate Regulatory and Legislative Framework

Results show that the weighted score for all the three towns was the same (0.09) before and remained so after the devolved system except for Kakamega town which increased to 0.18, (Table 5). This increase in scores after inception of the devolved system was attributed to the consideration of urban agriculture as a land use category in the Integrated Strategic Urban Development Plans (ISUDs) in these three towns. This was a major step towards planning, promotion and regulation of urban agriculture. There was a major change in the land use zoning for urban agriculture. In Kisumu, farmers were allowed to use open public spaces to grow crops like the prison farm in Nyalenda, Kisumu.

In another interview with one key informant, it was revealed that the department discouraged growing of maize in open public spaces such as along roadsides and there were no specific zoned areas for urban agriculture. Globally, there has been a trend of recognition for urban agriculture and the need for zoning specific areas for the practice. Lovett (2016) noted that municipalities across the UK are gradually recognizing urban agriculture as an integral part of planning, land use, and zoning ordinances. 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). Huang & Drescher (2015) note that in Canada, relevant policies such as official plans or official community plans, alternate policy documents and guidelines, zoning by-laws, and animal-related by-laws were reviewed to accommodate urban agriculture. Grande (2010) argued that city planners and gardeners agree on the importance of community gardens and support the institutionalization of gardening in the zoning code. However, there appears to be a perceptual disconnect between the parties. The urban agricultural zone is a largely symbolic political statement by the city whereas the primary concerns of gardeners are more tangible.

However, when urban farmers were asked the kind of policy needed, those who felt the practice was good, most of them mentioned the need for availability of agricultural extension service in Kisumu (25%), in Kakamega and Eldoret (59.0%) while in Kakamega, majority mentioned the need to make urban agriculture policy(89.3%). Among, those who had the view that the practice is very good, most of them needed access to credit in Kisumu (22.2%), making urban agriculture policy in Kakamega (100%) and availability of agricultural extension service in Eldoret (100%), (Table 6). Therefore, the three key areas that needed a policy were making of urban agriculture policy, ensuring availability of agricultural extension service and access to credit.

View on Urban Agriculture		Policy Needed						Total
		Make urban agriculture policy	Availability of Agricultural Extension Service	Accessibility of Credit from AFC, Microfinance etc	Subsidy Policy for inputs	Include UA in Structure of Agricultural Ministries	Land use Policy	
Good	Kisumu	19.4%	25.0%	22.2%	11.1%	8.3%	13.9%	100.0%
	Kakamega	89.3%	5.4%	1.8%	3.6%	0.0%	0.0%	100.0%
	Eldoret	0.0%	59.0%	4.9%	0.0%	36.1%	0.0%	100.0%
Very good	Kisumu	21.1%	18.4%	31.6%	10.5%	2.6%	15.8%	100.0%
	Kakamega	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Eldoret	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%

Table 6: View on Urban Agriculture by Town and Policy Needed

5.1. Land Use Zoning

In Kakamega, there are seven land use distribution by category of urban core in the Integrated Strategic Urban Development Plan (ISUDP) which include residential, industrial, education, recreation, public purpose, commercial and public utilities. However, urban agriculture is considered under agriculture use under section 4.8.9 of ISUDP –Kakamega. The plan proposes that the tracts of land between the nodes and the urban core be preserves 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. In Eldoret, the county land use regulatory framework (2014 – 2017) outlines the main land uses as; residential, industrial, educational, recreational, public purpose/ utilities, commercial, transport facilities and urban agriculture. The practice of urban agriculture is therefore recognized as a land use category.

6. Environmental Influence

On environmental influence, the study revealed that the weighted scores were the same before the devolved system (0.05) but doubled to 0.1 in all towns during the period after the devolved system, (Table 7). According to interviews held with key informants, it was reported that the government imposed a ban on use of plastic polythene bag (GOK, 2017) that resulted in an intended positive influence of reduced plastic bag menace in the environment. Moreover, discussions with focus group discussion members revealed that the ban also had an unintended influence of reducing ingestion of plastic bags by livestock leading to deaths. This finding concurs with findings from other researchers.

Criteria	Wt.	Influence Scenario 1: Before Year 2012						Influence Scenario 2: After Year 2012					
		Kisumu		Kakamega		Eldoret		Kisumu		Kakamega		Eldoret	
		Raw score	Wt. Score	Raw score	Wt. Score	Raw score	Wt. Score	Raw score	Wt. Score	Raw score	Wt. Score	Raw score	Wt. Score
Environmental Management													
Addressing Environmental concerns, hazards & risks	0.05	+1	0.05	+1	0.05	+1	0.05	++2	0.1	++2	0.1	++2	0.1
Total Score	0.05		0.05		0.05		0.05		0.1		0.1		0.1
Rank			1		1		1		1		1		1

Table 7: Multi-Criteria Analysis Matrix for Environmental Influence

Getchella et al (2002) concur that the most frequently mentioned livestock problems included 'gall sickness' (a vaguely defined condition not necessarily referring to anaplasmosis), parasites (both external and internal), chicken diseases and ingestion of plastic bags discarded in the environment. Ravindra (2014) argue that disorder of the gastrointestinal tract of the dairy cattle is common due to indiscriminate feeding behaviour and that ingestion of foreign body, especially plastics, in dairy cattle is of great economic importance as it causes severe loss of production and high mortality rate (Radostits et al., 2007).

The analysis of the level of environmental concern and the main concern were analyzed and findings revealed that those who were very concerned mentioned poor waste disposal and lack of fencing of urban farms/homesteads in Kisumu (36.6%) while lack of fencing of urban farms/homesteads was the main concern in Kakamega (78.8%). Among those who were fairly concerned, most of them had poor waste disposal system as main concern in Kisumu (43.6%), lack of fencing of urban farms/homesteads in Kakamega (50.0%) and misuse of agricultural fertilizers, pesticides and herbicides in Eldoret (95.0%). Those not very concern about environmental management had poor waste disposal system as main concern in Kisumu (25%) and poor waste disposal system, and pollution of waste, air & noise in Kakamega (50.0%),(Table 8).

Level Of Environmental Concern		Main Environmental Concern					Total
		Poor waste disposal system	Misuse of agricultural fertilisers, pesticides, herbicides	Indiscriminate cutting of trees in gardens	Pollution of waste, air & noise	lack of fencing of urban farms/ homesteads	
Very concerned	Kisumu	36.8%	5.3%	0.0%	21.1%	36.8%	100.0%
	Kakamega	13.5%	1.9%	1.9%	3.8%	78.8%	100.0%
Fairly concerned	Kisumu	43.8%	12.5%	3.1%	12.5%	28.1%	100.0%
	Kakamega	21.4%	0.0%	0.0%	28.6%	50.0%	100.0%
	Eldoret	5.0%	95.0%	0.0%	0.0%	0.0%	100.0%
Not very concerned	Kisumu	25.0%	0.0%	75.0%	0.0%	0.0%	100.0%
	Kakamega	50.0%	0.0%	0.0%	50.0%	0.0%	100.0%
	Eldoret	7.0%	7.0%	81.4%	0.0%	4.7%	100.0%

Table 8: Level of Environmental Concern by Town and Main Environmental Concern

Therefore, poor waste disposal system, lack of fencing of urban farms/homesteads, misuse of agricultural fertilizers, pesticides and herbicides and pollution of waste, air & noise, were the main environmental concerns in the three levels of environmental concerns in these towns. Also, the findings showed that different towns and cities tend to

have different environmental problems due to the level of growth of the town and practice of urban agriculture. Moreover, these finding were a pointer to the need for urban agriculture regulation in order to make it sustainable.

7. Relationship between Planning Legislations and Urban Agriculture practice

The study used Pearson Moment Correlation analysis to establish if there was a significant relationship between urban planning legislation and urban agriculture practice. Values of r between 0.9 and 1.0 as were considered as very highly correlated; between 0.7 and 0.9 as highly correlated; between 0.5 and 0.7 as moderately correlated; between 0.3 and 0.5 as a low correlation and correlation coefficients whose magnitude are less than 0.3 as of little, if any, (linear) correlation. The significant level (p-value) was set at .05 such that if the p-value was less than 0.05, then a significant difference does exist while if the p-value was larger than 0.05, it would be concluded that a significant difference does not exists. Table 9 shows the correlation results.

		Urban Planning legislations	Practice of Urban Agriculture
Urban Planning Legislation	Pearson Correlation	1	.389**
	Sig. (2-tailed)		.000
	N	205	205
Practice of Urban Agriculture	Pearson Correlation	.389**	1
	Sig. (2-tailed)	.000	
	N	205	205

Table 9: Correlation between Planning Legislations and Urban Agriculture
**. Correlation Is Significant at the 0.01 Level (2-Tailed)

The output indicates a significant (n=205; r =.389; p < 0.05) low positive correlation between urban planning legislations and urban agriculture practice. Therefore, given that the p-value was less than 0.05, it was therefore acceptable to conclude that there was significant positive relationship between urban planning legislations on urban agriculture practice, with more proactive urban planning legislations associated with more vibrant urban agriculture practice.

8. Conclusion

The study concluded that urban agriculture was highly practiced within the three study towns; hence there is need for it to be fully integrated in urban planning policy and legislation. It is also concluded that a large number of urban farmers do practice urban agriculture in Kisumu, Eldoret and Kakamega. There was a statistically significant association between level of practice and town where it was practiced. There is an average contribution of urban agriculture to urban food security in these towns, despite challenges which included; inadequate effective government policies, knowledge and skills, land shortage, access to credit and water shortage.

It is recommended that the authorities should address the current challenges affecting urban agriculture such as land shortage, inadequate government policies, inadequate knowledge and skills, access to credit and water shortage, so as to increase the level of practice of urban agriculture

9. Acknowledgement

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