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Effect of Rapid Urban Housing Expansion on On-Farm Activities of Rural Household Livelihoods in Simat/Kapseret Ward, Kenya

Dianah Cheruto^{1*}, Fred K. Wamalwa¹, Esther Chepsiror¹

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ABSTRACT

The study focused on examining how an increase in urban housing expansion affects livelihoods of rural households. The study objective was to determine the effect of urban housing expansion on on-farm activities of households in Kapseret/Simat ward, Kenya. A sample of 164 households was selected from a target population of 13610 households. A systematic random sampling technique was used to obtain the population of the study. A household survey questionnaire and an interview guide were used as tools for data collection taking a mixed methods research design. Quantitative data was analyzed using descriptive methods in form of frequencies, means and deviation. Inferential statistics specifically Chi square was used to test the hypotheses in terms of the strength and direction of the independent and dependent variables. Qualitative data was analyzed thematically and triangulated into the quantitative data of the study. Quantitative study findings indicated that there was a statistical significant relationship between urban housing expansion and on-farm activities of rural households ($p=0.000$). The qualitative study findings indicated that there was a shift from on-farm to off-farm livelihood activities of rural households. The study concluded that as land value and land sales increased, there was a higher likelihood for demand for land to facilitate the urban housing developments and ultimately housing expansion within the area of study. The study concluded that there was a significant statistical effect of urban housing expansion on rural household livelihoods.

INTRODUCTION

Rapid urban expansion has become a major concern especially to many mega cities' administrations in developing countries, because of its tendency to facilitate widespread changes in land use and encourage on-farm exit to off-farm livelihood activities of rural households. Rapid urban housing expansion is the independent variable of this study and refers to the process by which an agricultural economy is transformed into either a manufacturing, or a service-oriented economy. Household Livelihood which is the dependent variable of this study refers to the capabilities, assets and activities that people need for the attainment of a means of living. Off-farm activities refer to activities that translate to rural people obtaining cash money from such avenues as agricultural wage employment, self-employment, remittances, pensions and capital earnings and do not require them to necessarily own land to attain their livelihood. Off-farm activities to livelihood attainment was measured by five indicators including; the total number of farm activities, involvement in permanent employment, involvement in temporary employment, involvement in self-employment and annual income from off-farm activities.

Statement of the Problem

The urban housing sector is witnessing rapid development in Kenya. This necessitates the government to aggressively articulate policy frameworks to provide adequate social amenities. The government of Kenya is

already articulating this need through its strategy of the Affordable housing Agenda. Although this will ensure availability and quality social amenities, however there seems to be a concentrated effort in achieving selected goals and neglecting others. One such area is the livelihoods of agricultural households, which, depend on land as a capital resource (Sati *et al.*, 2017). Rapid urban housing expansion has seen the conversion of farmlands into built areas, a scenario visible in Kapseret/Simat ward and well-articulated in the Land Use Regulatory Framework report of Uasin Gishu County (2014-2017). Therefore, the preservation of rural agricultural lands has received little attention now than during the Kenyan independence years (Grcheva & Mwau, 2016). The county government of Uasin Gishu has created structures through its CIDPs to support the affordable housing strategy. However, legislations to minimize urban sprawl within the county have not been tightened as envisioned in the Land Use Regulatory Framework report (2014 – 2017). The report notes specific challenges associated with uncoordinated land use as facilitating rapid urbanization and numerous land subdivisions which threaten the County's agricultural lands. Although the government's role is seen as responding to social and urban development issues, rural land encroachment seems to have been overly neglected as it looks to address lack of urban housing as a primary social amenity. Consequently, the built environment has gradually expanded. If this is not checked rural livelihoods which are mainly agricultural stands

¹ Catholic University of Eastern Africa, P. O. Box 908 – 30100, Eldoret, Kenya

* Corresponding author's e-mail: cherutodianah23@gmail.com

threatened. Studies by Sati *et al.* (2017) and Nguyen, van Westen and Zoomers (2017) have examined the effects of urbanization on livelihoods and found that urbanization is a primary factor for rural land reclassification. Little has however, been documented on how urban housing expansion affects resources, assets, and capabilities of the rural residents hence necessitating this study. The study generates relevant data for rural populations and helps in informing their means of their livelihoods in terms of resource attainment, preserving their assets and capital base, and utilizing their capabilities.

Research Question

How has urban housing expansion affected on-farm activities of rural households within Kapseret/Simat ward, Uasin Gishu County, Kenya?

LITERATURE REVIEW

Several studies have explored on the effect of urban expansion on on-farm activities of rural households in local, regional and global contexts. Globally, a study by Pribadi and Paulet (2015) focused on examining the various dynamics of peri-urban agriculture with a specific focus on the rapid urbanization context of the Jabodetabek metropolitan area in East Asia. Using “descriptive” and “multivariate” statistical methods of social-economic sheet data to analyze land use changes and determine how urbanization impacted on peri-urban agriculture Pribadi and Paulet (2015) found that rapid urbanization continued to be witnessed even in low development density areas that were characteristic of rural areas. As a result, this led to loss of agricultural lands and further fragmentation of large tracts of arable lands. Swain & Teufel (2017) concur with the finding highlighted in the study above that urban expansion effects on-farm activities specifically crop-livestock farming systems which result from land use change patterns and facilitates the adoption of off-farm activities. Using a household survey to study the impact of urbanization on crop-livestock systems and how it ultimately impacts on livelihoods across various regions in South Asia, the study established that urban expansion affects both crop and livestock sector by changing consumption patterns in the demand and supply curve. However, a study by Firdaus & Ahmad (2011) which conducted an impact analysis on rural livelihood in New Delhi, India revealed that urban expansion had a more significant effect in changing a particular area from rural to urban. The implications stretched further to transitioning rural livelihoods and creating a shift that decreased on-farm activities and promoted non-farm livelihood strategies. The study used a cross-sectional survey design and a random sample of 896 households to examine the effect of urban expansion on rural source of revenue for the period 1951-200. The study found out that during this period, the Delhi urban area had expanded from 195.8 km² to 924.6 km². A total of 63% of the sampled households indicated that they had shifted their livelihood activities from on-farm to

off-farm. However, in Europe, the observation that rapid urbanization had significantly and negatively affected agriculture and hence on-farm activities, was different. The situation in Europe indicated that instead of many rural household livelihood activities shifting entirely to off-farm activities as a result of urbanization, the resultant effect was however the opposite as those households that initially depended on agricultural livelihoods blended other economic activities with agriculture thus leading to a livelihood diversification. As argued by Kristensen, Præstholm, Busck, Winther, Fertner, Vesterager and Vejre (2019), the rapid urbanization process witnessed in the Greater Copen Hagen area led to a more developed on-farm business structure so that there were farmers existing in an urban landscape. This was otherwise also observed as a situation that may have been facilitated by entrepreneurs venturing into a rural landscape. They observed that while farm diversification presented important opportunities, it also had its challenges. In the African continent scholars examined the scenario that urban development was more likely to force an on-farm activity exit among rural households. In a study by Davis, Di Giuseppe and Zezza (2017), the authors focused on examining how or not African households were moving away from practicing agriculture as a primary socio-economic activity. The authors examined this by analyzing the patterns of households’ income sources in Sub-Saharan Africa region. Using comparable income aggregates from a total of 41 national surveys obtained from 22 countries to assess the income generating patterns of rural households in the Sub-Saharan Africa region, the study established that on-farm activities continued to be the norm in most rural households in Sub-Saharan Africa. Similarly, a study by Ayele and Tarekegn (2020) conducted a review to analyze the impact that urban expansion had on agricultural activities in rural Ethiopia. The study found out that while land was an important economic resource for livelihood attainment and expansion especially in the rural areas, the rural-urban fringe farmlands had been rapidly converted into built up areas which further expanded urban areas into rural areas. In Kenya, agriculture and the practice of on-farm rural livelihood activities and opportunities had been largely affected by the resources available to achieve this end especially when population growth trends were considered. A study by Maja and Ayano (2021), sought to assess the impact of population growth on the natural resources and by extension the capacity of farmers to adapt to climate change. Using a comprehensive review to establish the impact of population growth on natural resources, the study found out that population growth continued to be a major threat to sustainable use of natural resources. Urban expansion and development of infrastructure in the peri-urban areas negatively affect livelihoods in terms of on-farm activities. As highlighted by Nicodemus and Ness (2010) in a study conducted in Nyahururu, Kenya, peri-urban expansion had been given little attention albeit its ability to impact negatively on

agriculture as a primary source of income in rural Kenya. While employing a case study approach to Nyahururu peri-urban center to establish the impact that the various peri-urban development dynamics had on household incomes, the study found out that there was a sharp decline in households that practiced full time agriculture from 90% in the 1960s to 49% in 2010.

METHODOLOGY

The research questions of the study were addressed using explanatory sequential mixed methods study design as this permitted the investigator to collect and analyze quantitative data followed by qualitative data to further help understand the research problem. Therefore, the explanatory sequential mixed methods study design allowed the investigator to use qualitative data to elaborate quantitative data. The researcher was able to use the narrative data obtained from interviews to explain numerical data generated from the household survey questionnaire. The design is appropriate for the current study as it allows the researcher to focus more on quantitative data collection and analysis while using qualitative data to inform quantitative data thus allowing for triangulation of findings (Creswell, 2013; Kumar, 2018). All households within Kapseret/Simat ward formed the target population of the study because the researcher sought to study livelihood attainment of rural households.

Additionally, six key informants specifically community leaders were also included into the study to complement findings from the targeted households. A sampling frame for this study was therefore obtained from the 2019 census conducted by the Kenya National Bureau of Statistics which provided the total number of households in Kapseret/Simat ward to be 13610 (Kenya National Bureau of Statistics, 2019; Crosby & Salazar, 2020).

A sample of 164 respondents was obtained from a target population of 13610 households using the Yamane (1967) formula. The formula considered the total population of the study to be 13610 households with a 90% confidence level. The sample size used a Z score value of 2.576, a margin error of 0.1 and a standard deviation (p value) of 0.5. The sample obtained comprised 164. Selection of participants of the study was done using systematic random sampling techniques. Systematic random sampling technique was considered appropriate for the study as it gave each and every participant of the respondents an identical opportunity of being chosen for the study (Daniels, 2012; Etikan, Musa & Alkassim, 2016; Crosby & Salazar, 2020). A sample for each unit within the area of study was proportioned. According to the data from the 2019 National census, Kapseret/Simat ward is divided into three administrative units which included Simat, Chepkatet and Lemook locations as shown in table 1.

Table 1: The sample size in each location within Kapseret/Simat ward

Location	Number of households	Proportion of the required sample
Simat	6805	$6805/13610 \times 164 = 82$ household heads sampled
Lemook	3828	$3828/13610 \times 164 = 46$ household heads sampled
Chepkatet	2977	$2977/13610 \times 164 = 36$ household heads sampled

A systematic sampling interval for each unit based on the unit population was obtained as 83. Therefore, every 83rd household within each location of Kapseret/Simat ward was selected. The sampling interval was achieved using a list of household individuals provided by the village elders from each respective unit. A survey questionnaire was used as a data collection tool to obtain information from households in Kapseret/Simat ward. Questionnaires with close-ended questions were considered the most appropriate instruments of data collection for quantitative household survey research as it allowed for an assessment of large populations (Creswell & Creswell, 2018; Jones, Baxter & Khanduja, 2013).

For qualitative data, a sample of six participants was purposively selected to participate in the study. The six participants comprised of mainly key and knowledgeable society members who were conversant about the various urbanization trends in the area and how this had influenced agricultural rural household livelihoods. The six key informants were selected to participate in the study using the non-probability sampling techniques specifically, purposive sampling technique.

The extent, to which the household survey questionnaire and the interview guide, the data collection tools in this

research measured what they purported to measure, was determined for their validity and reliability. The reliability and validity of the household survey questionnaire and the interview guide was determined using both face and content validity techniques. Specifically, a team of three experts knowledgeable and experienced on urbanization and livelihoods helped determine the validity of the questionnaire and the interview guide by analyzing both response and content validity. According to Bolarinwa (2015), face validity is established when an expert in a research area reviews a tool and is satisfied that it measures the trait of interest. The reliability of the household survey questionnaire was also determined. In ensuring the stability and consistency of the research instrument results, the researcher employed the test-retest technique reliability thus ensuring that the results obtained by the survey questionnaire measurement and its procedure could be replicated (Heale & Twycross, 2015; Mohajan, 2017). The researcher concluded that the household survey questionnaire was reliable with an r value of 0.7. According to Weise (1975) a reliability of 0.7 is often considered adequate for group studies although an r value of 0.8 is desirable.

RESULTS AND DISCUSSION

Quantitative Data Analysis

The research sought to assess the effect of urban housing expansion on on-farm activities. The study findings were as tabulated in Table 2.

The study findings on which category of on-farm activity have they engaged in within the last five years as a means of living revealed that 40.0% engaged in subsistence farming, 40.0% engaged in mixed farming while 20.0% engaged in livestock farming. On the size of land do they practiced the selected on-farm activity above showed that 27.0% practiced on below 0.1 acres, 73.0% practiced on below 0.5 acre while 10.0% practiced on above 0.1 acres. Regarding the size of land, they have allocated for on-farm activity, showed that 59.0% allocated below

0.1 acres, 20.0% allocated below 0.5 acre while 21.0% allocated above 0.1 acres. The study results on the size of land they have allocated for off-farm activity showed that 47.0% allocated below 0.1 acres, 20.0% allocated below 0.5 acre while 33.0% allocated above 0.1 acres. On whether the respondents had changed the way they use your land in the last five years, 69.0% agreed that they had changed the way they use your land in the last five years as compared to 31.0% who disagreed that they had changed the way they use your land in the last five years. The study results on how has land use for on-farm activity changed in the last five years, 75.0% said that it has increased while 25.0% said that it has decreased. Lastly, on how has the land use changes affected their annual crop incomes, 71.0% said that it has increased while 29.0% said that it has decreased.

Table 2: Effect of Urban Housing Expansion on On-Farm Activities

Statements	Response	Percent
Which category of on-farm activity have you engaged in within the last five years as a means of living?	Subsistence farming	40.0
	Mixed farming	40.0
	Livestock keeping	20.0
What size of land do you practice the selected on-farm activity above?	Below 0.1 acre	27.0
	Below 0.5 acre	73.0
	Above 0.5 acres	10.0
Please indicate the size of land you have allocated for on-farm activity	Below 0.1 acre	59.0
	Below 0.5 acre	20.0
	Above 0.5 acres	21.0
Please indicate the size of land you have allocated for off-farm activity	Below 0.1 acre	47.0
	Below 0.5 acre	20.0
	Above 0.5 acres	33.0
Have you changed the way you use your land in the last five years?	Yes	69.0
	No	31.0
How has land use for on-farm activity changed in the last five years	Increased	75.0
	Decreased	25.0
How has the land use changes affected your annual crop incomes?	Increased	71.0
	Decreased	29.0

The study also sought to examine how urban housing expansion has affected on-farm activities in their household. The results were as shown in table 3.

The results showed that 80.0% (mean=4.00) were of the opinion that Land use changes have affected annual livestock incomes, 71.0% (mean=3.55) opined that Land use changes have affected livestock acreage, 71.0% (mean=3.55) were of the opinion that Land sale has affected crop annual incomes, 63.2% (mean=3.12) were of the opinion that Land sale has affected livestock incomes, and that 62.2% (mean=3.11) were of the opinion that Land sale has affected crop acreage. The findings indicate that 79.8% (mean=3.99) of the respondents said that Land sale had affected livestock acreage, 56.2% (mean=2.81) showed that Land value had affected crop incomes, 59.4% (mean=2.97) were of the opinion that Land value had affected annual livestock incomes, 56.0% (mean=2.80) were of the opinion that Land value had

affected livestock acreage, 57.6% (mean=2.88) were of the opinion that Land value has affected crop acreage.

The results showed that Agricultural land density has affected annual livestock incomes, 90.4% (mean=4.52) were of the view that Agricultural land density affected annual crop incomes, 85.6% (mean=4.28) were of the view that Agricultural land density affected livestock acreage, 89.8% (mean=4.49) were of the view that Agricultural land density affected livestock acreage while 89.6% (mean=4.48) were of the view that Agricultural land density affected crop acreage.

The land sales have affected the on-farm annual incomes negatively because if land is sold then where do you get income from. Agricultural livelihood attainment has worked since independence. However, there is need for incentives and the government is already engaging in this through the fertilizer subsidy Programme. However, this is not enough. Those doing livestock keeping and other

Table 3: Urban Housing Expansion and On-Farm Activities

Statements		SD	D	U	A	SA	Total	Mean	Std Dev
Land use changes have affected annual livestock incomes	F	8	14	26	70	46	164	4.00	1.187
	%	5	8.6	15.8	42.4	28.1	100	80.0	
Land use changes have affected crop acreage	F	0	4	25	71	65	164	3.11	1.446
	%	0	2.2	15.1	43.2	39.6	100	62.2	
Land use changes have affected livestock acreage	F	7	20	25	99	13	164	3.55	0.969
	%	4.3	12.2	15.1	60.4	7.9	100	71.0	
Land sale has affected crop annual incomes	F	7	20	25	99	13	164	3.55	0.764
	%	4.3	12.2	15.1	60.4	7.9	100	71.0	
Land sale has affected livestock incomes	F	18	27	33	83	4	164	3.16	0.606
	%	10.8	16.5	20.1	50.4	2.2	100	63.2	
Land sale has affected crop acreage	F	0	4	25	71	65	164	3.11	1.446
	%	0	2.2	15.1	43.2	39.6	100	62.2	
Land sale has affected livestock acreage	F	8	14	26	70	46	164	3.99	0.971
	%	5	8.6	15.8	42.4	28.1	100	79.8	
Land value has affected crop incomes	F	8	18	24	65	50	164	2.81	0.439
	%	5	10.8	14.4	39.6	30.2	100	56.2	
Land value has affected annual livestock incomes	F	0	4	22	102	37	164	2.97	0.546
	%	0	2.2	13.7	61.9	22.3	100	59.4	
Land value has affected livestock acreage	F	8	13	28	46	68	164	2.80	0.167
	%	5	7.9	17.3	28.1	41.7	100	56.0	
Land value has affected crop acreage	F	0	4	25	71	65	164	2.88	0.123
	%	0	2.2	15.1	43.2	39.6	100	57.6	
Agricultural land density has affected annual livestock incomes	F	0	5	14	75	70	164	4.49	0.606
	%	0	2.9	8.6	46	42.4	100	89.8	
Agricultural land density affected annual crop incomes	F	0	0	20	55	89	164	4.52	1.446
	%	0	0	12.2	33.8	54	100	90.4	
Agricultural land density affected livestock acreage	F	0	0	6	55	103	164	4.28	0.860
	%	0	0	3.6	33.8	62.6	100	85.6	
Agricultural land density affected livestock acreage	F	0	0	6	55	103	164	4.49	0.936
	%	0	0	3.6	33.8	62.6	100	89.8	
Agricultural land density affected crop acreage	F	0	0	18	54	92	164	4.48	1.130
	%	0	0	10.8	33.1	56.1	100	89.6	

activities that require land must also be encouraged. This could work because people will now realize value for their land beyond selling it.

The study findings indicated that there was a statistical significant relationship between urban housing expansion and on-farm activities of rural households. This was in line with earlier studies by Pribadi and Pauleit (2015) a study by Pribadi and Paulet (2015) focused on examining the various dynamics of peri-urban agriculture with a specific focus on the rapid urbanization context of the Jabodetabek metropolitan area in East Asia. Using “descriptive” and “multivariate” statistical methods of social-economic sheet data to analyze land use changes and determine how urbanization impacted on peri-urban agriculture Pribadi and Pauleit (2015) found that rapid urbanization continued to be witnessed even in

low development density areas that were characteristic of rural areas. As a result, this led to loss of agricultural lands and further fragmentation of large tracts of arable lands. However, the study introduced a new factor that some on-farm activities such as horticulture and aquaculture could benefit from urban expansion as it meant a ready market with small requirements of land. On the other hand, paddy fields, crops and livestock agricultural activities were more likely to be displaced by urbanization necessitating them to move away to more non-urbanized areas. This study helped inform the current study especially in understanding how households have coped with the effect of increased urbanization on their on-farm livelihood activities. The researcher using the findings of this reviewed study was looking at for instance whether households have had to move their on-

farm activities to a more non-urbanized area. Also, the findings helped in informing the study by contextualizing the on-farm activity transition from for example livestock keeping or crop farming to horticulture and aquaculture. Swain & Teufel (2017) concur with the finding highlighted in the study above that urban expansion effects on-farm activities specifically crop-livestock farming systems which result from land use change patterns and facilitates the adoption of off-farm activities. Using a household survey to study the impact of urbanization on crop-livestock systems and how it ultimately impacts on livelihoods across various regions in South Asia, the study established that urban expansion affects both crop and livestock sector by changing consumption patterns in the demand and supply curve. The study also found out that the interdependencies between crops and livestock keeping practices have changed because of increasing rates of urbanization in India and Bangladesh.

However, crop production was found to be more diversified when compared to livestock keeping. The authors attributed this to urbanization which promoted cash generation by meeting the urban demand. Therefore, the study is particularly important in this research as it was valuable in explaining how urban expansion can disrupt agricultural practices by either causing a total shift to non-farm activities or adopting agricultural systems that facilitate cash generation from a growing urban population. The study therefore, gives the perspective that urban expansion does not necessarily cause a farm exit in terms of livelihood strategies but may rather facilitate an improved on-farm system.

However, a study by Firdaus & Ahmad (2011) which conducted an impact analysis on rural livelihood in New Delhi, India revealed that urban expansion had a more significant effect in changing a particular area from rural to urban. The implications stretched further to transitioning rural livelihoods and creating a shift that decreased on-farm activities and promoted non-farm livelihood strategies. The study used a cross-sectional survey design and a random sample of 896 households to examine the effect of urban expansion on rural source of revenue for the period 1951-2000. The study found out that during this period, the Delhi urban area had expanded from 195.8 km² to 924.6 km². A total of 63% of the sampled households indicated that they had shifted their livelihood activities from on-farm to off-farm. While using multiple linear regression models to analyze this data, the study indicated that residential complexes and household industries had a positive significant effect on agricultural land use patterns.

However, in Europe, the observation that rapid urbanization had significantly and negatively affected agriculture and hence on-farm activities, was different. The situation in Europe indicated that instead of many rural household livelihood activities shifting entirely to off-farm activities as a result of urbanization, the resultant effect was however the opposite as those households that initially depended on agricultural livelihoods blended

other economic activities with agriculture thus leading to a livelihood diversification. As argued by Kristensen, Præstholm, Busck, Winther, Fertner, Vesterager and Vejre (2019), the rapid urbanization process witnessed in the Greater Copen Hagen area led to a more developed on-farm business structure so that there were farmers existing in an urban landscape. This was otherwise also observed as a situation that may have been facilitated by entrepreneurs venturing into a rural landscape. They observed that while farm diversification presented important opportunities, it also had its challenges. The authors also argued that competition for land tend to be greater in the peri-urban areas as this area experiences rapid urbanization. Using a case study of 146 farm owners, Kristenen *et al.* (2019), found out that 60% of all farm owners in the study participated in on-farm business structure diversification activities. The reviewed study also found out that in terms of resource use, buildings were equally important in both the rural and peri-urban settings particularly in supporting the on-farm business diversification activities as this was placed at 95% compared to 47% of farmers who showed that such on-farm business diversification strategies could be practiced in the outdoor space. However, this on-farm business diversification showed no sense of permanence as they could well be located in the urban areas. The reviewed study was particularly relevant to the current study as it helped in understanding how farmers make decisions on whether to practice their on-farm livelihood activities on buildings or on open space. The reviewed study was also important to the current study as it introduced planning issues that regulatory institutions and agencies face in planning of capital resources such as land particularly in the peri-urban areas such as the current area of study.

In the African continent scholars examined the scenario that urban development was more likely to force an on-farm activity exit among rural households. In a study by Davis, Di Giuseppe and Zezza (2017), the authors focused on examining how or not African households were moving away from practicing agriculture as a primary socio-economic activity. The authors examined this by analyzing the patterns of households' income sources in Sub-Saharan Africa region. Using comparable income aggregates from a total of 41 national surveys obtained from 22 countries to assess the income generating patterns of rural households in the Sub-Saharan Africa region, the study established that on-farm activities continued to be the norm in most rural households in Sub-Saharan Africa. The study revealed that an estimate of 52% of rural households in the subsahran Africa continued to practice agriculture as a primary economic activity as compared to other regions which posted an estimate of 21%. The reviewed study also sought to understand how geography influenced agriculture. The study found out that irrespective of the geography and the ultimate integration of an area into the larger urban context, farming remained the number one alternative for most rural households especially where agro-climatic

conditions remained favorable. However, the authors do not dispute the fact that African rural households were not on a different trajectory when compared to other regions in terms of on-farm exit transition to non-agricultural livelihoods. The study is important to the current study as it assesses how urbanization influences agriculture based livelihood incomes in terms of geography and the ultimate integration of a rural area into an urban space. The paper therefore informs and offers direction to the current study on how both on-farm and off-farm activities of rural households in Africa compares to other regions globally.

Similarly, a study by Ayele and Tarekegn (2020) conducted a review to analyze the impact that urban expansion had on agricultural activities in rural Ethiopia. The study found out that while land was an important economic resource for livelihood attainment and expansion especially in the rural areas, the rural-urban fringe farmlands had been rapidly converted into built up areas which further expanded urban areas into rural areas. Coupled with this, the study established that the rapid conversion of land into a built area was a consequence of the increase in demand for land in the Peri-urban areas to satisfy the need for housing establishments and other non- agricultural activities. This study also acknowledges the absence of a comprehensive city planning and a weak government response to curbing unchecked urban expansion that greatly impacts on agricultural practices in the rural areas. The study also found out that the major causes for rapid urban expansion was migration and urban and urban expansion. The findings of this study are relevant in addressing the current research problem of this study which includes the rapid conversion of farmlands and the consequent on-farm activities exit to off-farm activities.

In Kenya, agriculture and the practice of on-farm rural livelihood activities and opportunities had been largely affected by the resources available to achieve this end especially when population growth trends were considered. A study by Maja and Ayano (2021), sought to assess the impact of population growth on the natural resources and by extension the capacity of farmers to adapt to climate change. Using a comprehensive review to establish the impact of population growth on natural resources, the study found out that population growth continued to be a major threat to sustainable use of natural resources. Regions that had experienced high population growth faced a scarcity of arable lands and consequently a decrease in agricultural incomes. This directly relates to the on-farm livelihood activities and rural household incomes that the current study sought to establish hence the reviewed study helped in assessing this front.

Urban expansion and development of infrastructure in the peri-urban areas negatively affect livelihoods in terms of on-farm activities. As highlighted by Nicodemus and Ness (2010) in a study conducted in Nyahururu, Kenya, peri-urban expansion had been given little attention albeit its ability to impact negatively on agriculture as a primary

source of income in rural Kenya. While employing a case study approach to Nyahururu peri-urban center to establish the impact that the various peri-urban development dynamics had on household incomes, the study found out that there was a sharp decline in households that practiced full time agriculture from 90% in the 1960s to 49% in 2010. While this finding could point to a possible shift by populations to other non-farm activities or diversification of rural livelihoods as argued by Krishna (2012), it however has a negative implication livelihoods attainment as Satterthwaite *et al.* (2010) and Sati *et al.* (2017) contend that farming is the primary source of livelihood and for households that live in the peri-urban specification, this is most often threatened. Accomplishments such as herding and cattle keeping, subsistence and cash crop farming among others are predominant in rural settings (Tacoli, 2003; Miheretu and Yimer, 2018; Mphande, 2016).

Qualitative Data Analysis

The qualitative study also sought to find out whether there had been urban extension in the area of study and whether such expansion had affected on-farm activities of rural households. The qualitative study found out that Kapseret/Simat ward which is the area of study had in the last five years alone experienced rapid urban housing expansion. This expansion had affected the on-farm livelihood activities of households in the area of study as various interviewees assert;

Yes, I have experienced land use change transition in this area. In fact agricultural land has been reducing on a daily basis because of urbanization. The main economic activity in this area has long been farming both cash crop and livestock keeping sort of farming. However, this has been reducing on a daily basis due to urbanization. In terms of possession of maps, I do not have any. However, I have seen transitions happen in my stay in this region. For instance myself I have practiced subsistence farming moving away from cash crop.... The effects are immense because farming is affected and this means at the household level livelihood is affected.

Reverend

Almost every part of this ward has experienced urban housing expansion even beginning right here from kapseret. This is an area that has undergone several and rapid changes in as far as land use are concerned. In a snapshot, land use has gradually transitioned from being largely agricultural to a multifaceted use. Now several pieces of land which were home to cash crop farming such as maize and wheat have been converted into buildings most of which are rentals. I can say that land use has moved from being rural to semi-urban sort of setting. Yes.

Ward administrator

Although people have traditionally practiced agriculture in this location, the last few years I have witnessed a

change in the way people use their land. Many people prefer to sell their lands and move into the town. Others move further away from the town. Others also lease their lands for various other purposes including manufacturing and quarries.

Senior Community Resident

Urban housing expansion has been witnessed in Simat location particularly areas along the tarmacked road and especially around Kapseret-Kamagut by pass infrastructural development. There have been various land use transitions in the area within the last five years. the rich agricultural lands in the area for example have largely been changed to either real estate developments or converted into other use apart from agriculture. This has mostly been facilitated by Infrastructural developments such as established road networks and housing developments.

Area Chief

The above qualitative study findings were in line with the researchers quantitative study findings on urban housing expansion and its effect on rural household livelihoods. The study findings indicated that there was a statistical significant relationship between urban housing expansion and on-farm activities of rural households.

CONCLUSIONS

The study concluded that all the factors of urban housing expansion under study including land sale, land value, agricultural land density and land use changes significantly contributed to an decrease in on-farm activities of rural households. The quantitative study findings also indicated that there was a statistical significant relationship between urban housing expansion and on-farm activities of rural households. The qualitative study findings also showed that the area of study had witnessed rapid urban housing expansion in the last five years as depicted by the increased urban housing establishments in the area. The qualitative study findings also revealed that compared to the last fifteen years, the rural households within the area of study had diversified their livelihoods hence moving away from agriculture dependencies. However, many households continued to remain characteristically farmers despite the livelihood shifts. Both qualitative and quantitative studies confirmed the hypothesis that urban housing expansion affected livelihood activities of rural households. The findings were in line with earlier studies such as those by Satterthwaite *et al.* (2010) and Sati *et al.* (2017) and Krishna (2012) who found out that urban housing development within an area influenced other urban related developments such infrastructure which caused the rural-urban transition. The study therefore, concluded that urban housing expansion affected rural household livelihoods by causing a rural-urban shift.

The study concluded that rapid urban housing expansion significantly contributed to decrease in on-farm activities of rural households in Kapseret/Simat ward, Uasin

Gishu County, Kenya by effecting land use changes, increasing land sales, increasing land value and decreasing agricultural land density. This was due to an increased demand for land for construction of both commercial and residential developments including infrastructural developments.

The study recommended that both the county and the national governments should come up with policies to outlaw arbitrary sale of land especially in areas where the main requirements of land use is agriculture to enhance the effectiveness of zoning regulations. It is important that the management of land be made the first priority in the study area and the nation as a whole. The various land sector agencies and institutions responsible for land management should enforce the existing laws on land management. Land should therefore be managed using zoning and planning regulations and development should be channeled bearing in mind the zoning and planning laws of the area.

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