



Influence of Land Use Regulatory Instruments on Household Disaster Risk Management in Eldoret Urban Area

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ABSTRACT

Land use planning seeks to regulate land use in efficient manner, thus preventing escalation of hazards into disaster risks that would threaten lives of households in both rural and urban areas. Thus, it enables households in urban areas to access serviced land at affordable prices, access socio-economic services, infrastructure, transportation facilities and good environment. The demand for urban serviced land is often in the increase, and this has been enhanced by natural population growth and rural-urban migration. This study examined the influence of urban land use planning regulatory instruments on household disaster risk management in EUA. Descriptive Survey research designs were used. The classical spatial economic theory (making room model); stakeholders' theory and disaster reduction theory (community-based model) were applied in this study. The study targeted the households in Eldoret Urban Area of (Langas, Kapsoya, Kamukunji and Kapsaos). Proportional stratified random sampling was applied for the purpose of quantitative data collection, while, purposive sampling was used for qualitative data. A total sample size of 550 respondents was sampled. Questionnaire was the main instruments to collect primary data, alongside key informant interviews (KIIs) and focus group discussions (FGDs). Finally; descriptive, inferential, regression and correlation statistics were applied in data analysis and interpretation. Results indicated that land use planning regulatory instruments have combined influence of 69.0% over disaster risk management. Test results on H_0 showed that there was significantly positive relationship between urban land use planning and disaster risk management. The effect of Land use planning regulatory instrument on HDRM was significant positive ($R=0.878$), the study revealed that Land use planning regulatory instrument accounted for 87.8% ($R^2=.771$) of HDRM. The findings are a pointer to the fact that land use planning and its three dimensions had significantly positive effects on household disaster risk management. From these results, it can be concluded that urban land use planning is a critical tool or technique in designing and developing urban areas where hazardous zones are mapped, demarcated and kept off from households' socioeconomic activities. It was recommended that urban authorities must focus on urban land use planning to achieve sustainable development and growth.

Key words: Land Use Regulatory Instruments, Household Disaster Risk Management, Eldoret Urban Area

INTRODUCTION

The Sendai Framework of Action (SFA), (2015), emphasizes the significant role of land use planning in mitigating the rapid escalation of hazards, especially in urban areas. This has been evidenced in the slum, and peri-urban areas which are outside the urban planning jurisdiction, hence up hazard developments. Urban land use planning which applies various accepted



regulatory instruments brings law and order, and therefore, enable households to under take the socio-economic activities in a manner that allows the environment to remain clean.

Background of the Study

Globally, controlling rapid urban disasters has been recognised as hard to overcome. In USA, Britain, China, India, Japan, Malaysia, Nigeria, Ghana, Ethiopia and Kenya among others, dealing with socioeconomic and environmental hazards and vulnerabilities is a challenge experienced and whose severity is worrying (Bendimerad, 2008). This has left urban household to experience devastating outcomes and impacts from inadequate and inequitable socioeconomic and environmental services. Although regulatory policy and planning processes such as development planning, land-use planning, natural resource management planning, poverty reduction planning, are considered critical to disaster risk management, the current practices disprove the application of any of such processes (Action Aid International. 2006; African Union Commission, 2009).

With lack of such practices, the anticipated global urban population would swell to 5.3 billion by 2030 and would continue to be potential victims of disasters whose outcomes and impacts are devastating. According to UN-Habitat (2008), over a half of humanity globally now lives in cities, where they are occupying only 3% of world space or land and by 2050, almost 70% of the World's population would be residing in urban areas. This means that effective and efficient urban land use planning would be critical for improved productivity of urban basic needs. This would enhance provision of green spaces for future expansions and recreations, residential, commercial, and industrial and other land uses critical to urban household welfare. Approaches and tools that study and map, analyze economic, environmental and hazard data; formulation of alternative development decisions; and design of long-range plans for different geographical and administrative scales are critical.

Rapidly exploding growth of cities is overwhelming government institutions with the pressures of urbanization. With cities expanding so rapidly, much of the growth is haphazard, far exceeding the cities' capacity to adequately plan and control development. As a result, uncontrolled urbanization often feeds the growth of slums, reinforces poverty, and diminishes cities' ability to deal with disasters. The urbanization has taken place without regard to protecting against extreme hazard events. Faced with the needs to provide housing infrastructure and services, cities developed haphazardly and often without any formal land use and urban planning process. When these elements exist, they are typically oriented towards optimization of land, and seldom incorporate any disaster risk management parameters. Migration aggravates the problem by creating large scale informal construction (Acemoglu *et al.*, 2013). Migrants also face significant challenges in adapting their past experience and coping strategies to the new risk environment in cities.

Current and new migrants and the underprivileged move into inner urban neighborhoods' where buildings are old and in poor maintenance conditions; access roads are narrow and service delivery is difficult. These old buildings and the aging infrastructure constitute a constant threat to their occupants from hazards such as fires, flash floods and insecurity. A significant proportion of urban dwellers resides and/or works in these highly vulnerable buildings where they are at high risk from multiple hazards and where access for emergency vehicles is often difficult and can be completely obstructed by building debris in case of a hazard event. Solutions to reduce social and physical vulnerabilities are socially, politically and financially difficult to devise and implement. Reducing the social and physical



vulnerability of these neighborhoods' remains a formidable challenge to the authorities (Albala-Bertrand, 2013).

Urban risk from extreme hazards has largely been ignored by county governments; compounding the problem, cities have largely and chronically been neglected by national governments and international organizations. The premise has been that cities, especially megacities, have the capacity to address risk on their own; however, it is now clear that most cities, particularly in the developing world, are not effectively managing their risks. The validity of such a premise needs to be revisited as it is challenged by the ever increasing evidence of social and physical urban vulnerabilities. Schools, hospitals, essential facilities, highways and feeder roads, housing, commercial and institutional property continue to be designed and built with little regards to the safety to extreme hazards such as fires and floods. Structural vulnerability studies undertaken in large cities around the world indicate a high vulnerability of existing built environment to natural hazards. Urban disasters, particularly soilquakes have over and over demonstrated the precarious conditions of the built environment in cities. The physical vulnerability of existing environment constitutes one of the biggest threats to urban populations (Anas and Liu, 2007; Barro, 2013).

In most developing countries, legislative and institutional arrangements inhibit rather than enable local action. While it is recognized that disasters are initially local events, accountability, authority and resources are not sufficiently decentralized to enable local governments to assume ownership and take actions to manage disaster risk effectively. Furthermore, politicians, administrators, and community leaders all face conflicting priorities, and household disaster risk management almost invariably takes the back seat to other needs which may be considered more pressing or easier to solve. Risk is not managed preemptively, but thought of in terms of something to be dealt with when disaster strikes, through emergency response and humanitarian assistance. Equally, the lack of experience, methodology and standards make HDRM an unattractive proposition for urban authorities (Bin and Landry, 2013).

Household disaster risk management (HDRM) is complex, and few administrators have experience in HDRM implementation. It takes time, effort, tools, and training to assimilate HDRM in city functions and ongoing operations. Significant deficiencies remain throughout cities and megacities in terms of inter-institutional coordination, warning systems, incident command and control, resources for response, relief, recovery, and rehabilitation practice following urban disasters. An additional weakness relates to the project planning processes of government. While concepts are often understood and policies are in place, carrying these policies and concepts to practice is a major hurdle for governments at all level (Christian Aid, 2014; Corbyn, 2010). The process of project planning and execution needs to be recognized as a major weakness if progress in DRM has to be achieved. Even among cities which have shown competency in establishing planning processes to control their physical development, carrying these planning processes into project planning and execution remains a challenging step.

Most emerging growing urban areas are densely populated. The disparities in socioeconomic status are visible in disaster risk management process. Those households with high income have low densities compared to low income households. For example, in estates such as Elgon View in Eldoret, Laving'ton, Kileleshwa, Runda, there are four persons occupying an hectare while in Kawangware, Kibera, Kariobangi, Mthare and Mukuru, Kipkaren, Brigadier, Huruma, Langas, and Maili Nne, low income tenements go up to 800 persons per hectare (Khayesi,



2007; Coulombel, 2010). But densely-populated regions are among the highest at risk of disasters and health-related emergency, yet little is known about risk coping and supportive strategies to households. In such cases households are often ill-equipped to cope with disaster and evacuation, regardless of their susceptibility to threat. Household and individual preparedness is critical to the overall effectiveness and cost-efficiency of national disaster response strategy. Moreover, urban households with the lowest incomes, lack employment, no investment assets, lack high level of housing mobility, live in poor quality housing that face among the highest risks of disasters in urban areas (Chan *et al.*, 2016).

According to (UN-Habitat, 2010), by 2030, the global urban population will be 8 billion, out of which 3.4 billion shall be living in slums and informal settlements. In the three urban forms of slums, informal settlements and pre-urban areas, the main cause of disaster risks is the lack of serviced land, land security which exposes the households to physical, market evictions as well as inappropriate management of urban land spatial structure elements. In the vast majority of sub-Saharan African cities, as well as in Kenyan urban centers, the urban poor as well as large segments of low and middle-income groups do not have access to land provided by the public and formal Private Sector (Durand, 2005). This has been evidence in many Kenyan urban areas including Eldoret Urban Area (Eldoret Municipal Strategic Plan, 2012).

In Eldoret Urban Areas, the slum areas, informal settlements and pre -urban areas are unplanned and therefore, make it difficult to access serviced land, services and infrastructures, thus enhance disaster risk hazards among the households in this urban forms or structure. Most of households' in these areas do not also have any form of land security. And whenever the serviced urban land is available, the issue of affordability arises. Because of high prices of urban land, most vulnerable households cannot afford them; therefore, the only option available to them is to occupy the unserviced urban land in the slum, informal settlements and pre-urban areas which are fragile and exposed to disaster hazard risks. The land is poor in terms of topography such as wetlands, land under electricity voltage, which are all disaster risk exposed.

During disaster occurrences, most urban households depend on well-wishers whenever, a disaster strikes. When a building collapses, fire breaks out, floods or any other hazards is triggered causing disasters, donations of foodstuffs, beddings, temporary shelters (Tents), are common practices (Putman, 2010; Coulombel, 2010). An indication that most practices still rely on relief distribution instead of providing households with the capacity to develop their economic potential, and attract business and capital. Equally disturbing is that well-wishers without well-organized patterns are the systems involved, which is a disaster of its kind (Hunte, 2010; Khayesi, 2007).

This is because most of urban areas are experiencing employment shortages, with large number of people concentrated on fragile lands, making reduction of vulnerability, and coping ability to disasters in metropolitan areas a critical challenge facing development. So serving increasingly growing urban household population equivalent to over 60% of world population from urban land size equivalent of 9% is a hard task most cities have failed to pursue successfully (Gunjal, 2016). The determination to satisfy each expectations of more than 70% of world population that has migrated to urban areas using only 9% available urban land proves difficult This land size in its fixed distribution feature cannot be affected but only improved in productivity, including practices that enhance multiple and balanced uses (Gaubé and Remesch., 2013).



Urban land use practices that provide adequate greenspaces, adequate circulation and connectivity, that accommodate primary and alternative transportation modes critical during emergencies are considered important but seems lacking. For example, during emergency evacuations from floods, fire outbreaks, landslides, and collapsing buildings among common urban disasters become difficult. Moreover, traditional land use approaches for addressing disaster risks have been based on the likelihood of disaster events occurring, with little consideration of the consequences associated with such events. This has left most urban dwellers to face the wrath of disaster outcomes, whose scopes are important impact on development and livelihoods. Providing adequate and sustainable socio economic, and environmental services from urban land is a challenge proving hard to be solved any sooner (Saunders and Becker, 2015).

Instead of designing and developing urban areas where hazards are not triggered to react, and risks are minimized leading to no disaster occurrences, many urban areas are common with increased disasters. Worrying is the rising urban household population indicating that when urban disaster occurs, the casualties would also grow. Since 1900 there has been an increase in the numbers of disasters with an even greater increase in the physical, economic, social, environment and human costs of these events (King *et al.*, 2013). In some countries, the numbers of people affected by disasters have increased comparably, but numbers of deaths have diminished, but this is not the case in most countries such as Kenya, Nigeria, Indonesia, India, and Philippines among others (King *et al.*, 2013).

Although the understanding of such provisions, would provide a guide for planning and implementing alternative modes of travel to afford greater accessibility for residents and visitors, mitigate congestions and pollution, and support a more efficient and sustainable land use pattern. Transition to a more complete multi-modal transportation system requires an integrated land use and transportation planning approach which has always been inadequate. The planned transportation system shall support the City's vision for a land use pattern with concentrated mixed-use Village Centers and neighborhoods.

In Kenya, for example, there are approximately 2.5 million slum dwellers in about 200 settlements in Nairobi representing 60% of the Nairobi population and occupying just 6% of the land. Kibera houses about 250,000 of these people. Kibera is the biggest slum in Africa and one of the biggest in the world (African Population and Health Research Center (APHRC), 2014). According to Karanja, (2010), the 2009 Kenya Population and Housing Census reports, Kibera population is put at 170,070, contrary to previous estimates of one or two million people. Other sources suggest the total Kibera population may be 500,000 to well over 1,000,000 depending on which slums are included in defining Kibera (Kimathi, 2013).

The difficulty faced in urban areas include common practices such as digging up already made facilities, for example roads, to lay additional sewer pipe, power lines, water pipes, fibre optic communication lines. This leads to destruction to already made roads, sewer paths, power lines and houses among others. This is an indication of the high degree of disorderly and phased development patterns that would also be less expensive for urban household population cannot be realized. Moreover, desire to achieve public services and low-density, scattered development is also hardly possible.

Urban areas continue to be the hotbed of socioeconomic and environmental disasters. The urban risks and urban hazards is in the increase due to rapid urban expansion, rapid urban



population and rapid slum growth being experienced in the world, as a result of rural-urban migration and natural population growth. The same is applicable in African cities too, and particularly in Kenyan cities. A study by Obundho (2004) indicates that population in Eldoret Urban Area (EUA) since 1963 has been growing at 6%, yet urban space or land remains constant 147 sq. km as per 2009. Practices that provide equitable and multiple urban land uses to strengthen household socioeconomic and environment needs are inadequate especially, in spatial structures such as slums, informal settlements and peri-urban areas which are outside urban planning areas.

Most slum and informal settlement areas such as Langas, Kamkunji, and Hururma of Eldoret, tends to have low-income, high rates of unemployment, and people live under hazardous conditions such as poverty, poor health, polluted surroundings, poor waste management, faulty electric installation, destruction of sewer lines and underground telecommunication, power, water and sewer lines, fire destructions, falling and sinking buildings, floods, droughts, are increasing in frequency and severity. This is a poverty developing environment exposing urban households to all sorts of poverty related disasters. Inability to afford quality and quantity housing, acquisition and ownership of assets that are collateral for financial credit instruments would be lacking.

The inadequate and inequitable infrastructural facilities and lack of green space in most urban areas discourages socioeconomic and environmental development and growth of investments, linkages to other regions, business opportunities and emergency management, especially in slum and informal settlement areas. Important amenities such as health facilities, recreational centers, better educational facilities, shopping malls, adequate quality housing units, and security centers are lacking leading to poor access to social amenities to most urban households. Urban areas continue to expand, with poor established patterns of settlements that lack proper planning. This inadequate planning practice has led to low level of wealth creation to majority household population. Thus urban household populations have been exposed to disaster risks as only a small percentage has wealth creation muscle.

In Eldoret Urban Area, encroachment by private developers into road reserves, recreational spaces, riparian areas, water runoff paths, uncontrolled building heights and sizes among others is rampant. For example, Kapsoya (a formal spatial structure) that was planned to have specific types of housing structures has failed to maintain this plan, and today developers establish their own patterns. This has led to congestion, overcrowding, lack of clean water, access roads, that when fire occurs, total destruction of properties and deaths casualties is expected. Therefore, this study sort to examine the influences of urban land use planning regulatory instruments and urban land use hazards to moderate household disaster risks in Eldoret Urban Area.

METHODOLOGY

The Study Site

The research study was carried out in Eldoret Urban Area. Eldoret is located in the high agricultural potential highlands of Uasin Gishu County in Rift Valley. It lies at an average altitude of 2,085 meters above sea level. The northern part of Eldoret is marked by steep slope. Eldoret experiences an average daily means maximum temperature of 24°C. It receives a total annual average rainfall of 1,149.9mm (Uasin Gishu County Integrated Development Plan, 2008 – 2022).



Study Population

Eldoret Urban Area, was first settled by the Afrikaans in 1908, and by that time the town was covering only 25 sq.km, with a population of 8,000 people in 1948, this grew to 18,000 people by 1969, and thereafter, at accelerated growth rate of 6% to 197,000 people in 1999, and to 497,446 in 2009 (Eldoret Municipal Strategic Plan, 2012). Kamukunji is located in Uasin Gishu County, Eldoret Urban Area, and Soi Constituency, Kapsuswa-Kwinet ward, Kiburgen location and Kamukunji sub-location. The settlement has an area of 237 ha and is approximately 2.5 km north of central business district. The settlement is named after a meeting place where initial residents used to converge, and is part of the wider Kamukunji Estate. The total population is 9188 which is composed of 1,104 households (Kenya Population Census, 2009).

The settlement is flat on its southern edges and then extends up the sides of a rocky hill on its northern boundaries. The settlement becomes quite muddy during the rainy season and is surrounded by undeveloped or agricultural land as well as other less dense settlements to its northern. Kamukunji estate is also surrounded with a number of quarries, noted among them is the Kitur quarry. From the south it is surrounded with light industries.

Langas is located 5 km. south of Eldoret (CBD). It measures (425 ha.), with over 3,360 plots all of which were acquired informally. Langas informal settlement is one of the largest informal settlements in the municipality. It developed as a result of development of Rivatex industry in the late 1970s to accommodate textile workers from the industry and other light industries which developed around Pioneer area. Langas estate is within Langas ward, Pioneer location, and Kapsaret constituency.

Kapsaos was another pre-urban area that was sampled. Kapsaos area is located in Kapyamit location, Huruma ward, and Turbo constituency. It occupies an area of 345 ha, with a population of 7345 people (Kenya Population Census, 2009). Kapsaos is pre-urban area just adjacent to Mail Nne, which is appropriately 6.5km from the CBD. As a pre-urban area, it has been characterized with a large agricultural land with inadequate services and infrastructure. Although land in this area has land tenure security (title deeds), but their source of water was mainly borehole, with no sewage facilities, sanitation has been mainly, pit latrines. In this area, building code/standards has not been applied as no urban planning is applied in the area.

Kapsoya estate is allocated in Kapsoya location, Kapsoya sub-location, Kapsoya ward, Anaibikoi constituency. Kapsoya estate is a formal area, site and scheme project started in the 1980s. The site and scheme had been sub-divided into 1/8 ha and total there are 258 plots. The scheme had been provided with adequate urban services- piped water, sanitation sewage facilities and other infrastructure. Housing quality and quantity in the area is good and satisfactory. And because of the availability of urban services and infrastructure, households in the estate are not exposed to disaster risk hazards. However, recently, due to reluctance of the (EUA) authorities to enforce the land use regulatory instruments, especially, the building codes, the Kapsoya population density is rapidly increasing to the cropping up total buildings and soon the area population would be above the existing or available urban services. Kapsoya estate covered an area 121.5 ha with a population of 8446 people (Kenya Population Census, 2009).

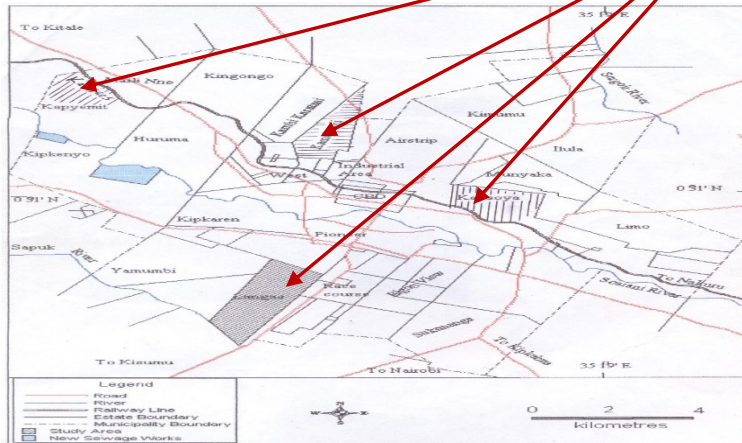


Figure 1: Study Area Map
Source: Eldoret Urban Plan 2012

Research Methodology

The research methodology in this study focused on types of data collected and sources of data consulted, data collection methods and instruments which included questionnaires and interviews. The section explains the rationale for selecting the research methods and sampling techniques used. Mixed methods approach was used for this study, where both qualitative and quantitative methods were combined. The mixed methods provide a procedural approach for collecting, analyzing and mixing both quantitative and qualitative data at some stage of the research process within a single study to understand a research problem more completely (Mark *et al.*, 2009; Maree, 2010).

Since mixed research method was used in this study descriptive survey, purposive research and systematic research designs were used. For quantitative data collection, a descriptive and purposive design was applied. The sample was chosen by simple systematic and purposive selection, whereby every member of the population had an equal chance of being selected. Although there are many household units and large population of the members in the area, time, human resources and financial constraints dictate that a limited study be conducted, hence a sample size selection was conducted.

For qualitative data collection, a purposive sampling method was used, and according to Leedy and Ormrod (2001) purposive sampling is applied where people are chosen for a particular purpose, for instance we might choose people who we have decided are “typical” of a group or those who represent diverse perspectives on an issue. The County Director of Lands and



Planning, County Head of Physical Planning, Sub- County Administrator (County Land Surveyor), County Land Registrar, County Land cadastre/ Land Officer and Chiefs from each area of study (Langas, Kamukunji, Kapsoya and Kapsaos) were selected for completing questionnaires and face-to-face interviews because they experienced everyday life and were representing selected areas, thus relevant sources for this study topic investigated.

This study was conducted by using both probability and non-probability sampling. In probability sampling, the researcher specified in advance that each segment of the population was represented in the sample while non-probability sampling was applied where the researcher had no way of forecasting or guaranteeing that each element of the population was presented in the sample. According to Leedy and Ormrod (2001), some members of the population have little or no chance of being sampled as participants in the study. Creswell (2003) supports the application of mixed research methods during the first phase then followed by purposive sampling as second phase in the selection of participants desired to represent the population.

The required data was gathered from primary and secondary sources. In the primary data, collection was done using questionnaires, focused group discussions and interview process. Likewise, literature reviews of relevant sources of information about the research problem were conducted as secondary data.

Target Population

According to Saunders, *et al.* (2003), a target population consists of the full group of potential participants to whom the researcher wants to conduct the research for the study. It comprises of all the households living within urban, sub-urban and pre-urban areas of Eldoret town. This research study covered mainly Eldoret Urban Area formally Eldoret Municipality. It covered the main four spatial structure and forms of urban areas, which included the slum areas, informal settlements areas, pre-urban areas and formal areas. Therefore, a study population comprised of the total population of Eldoret Urban Area as per 2009 census which has been estimated at 497,446 who were 18 years and older (Kenya population census, 2009). The study concentrated on Kapsoya, Langas, Kamukunji and Kapsaos, as shown in Table 1.

Table 1: Population and Sampling Frame

Spatial Structure/Form Size	Area within EUA	Population Size	Target
Formal area	Kapsoya	8446	84
Informal Settlements	Langas	25021	253
Slum areas	Kamukunji	9188	91
Pre-urban area	Kapsaos	7345	72

Source: Eldoret Strategic Development Plan 2012

The Sample Size

This refers to the actual number of subjects involved in this study. Webster, (1985) defines a sample size as a finite part of a statistical population whose properties are studied to gain information about the whole. It can simply be defined as a set of respondents selected from a larger population for the purpose of a survey. The researcher applied proportional stratified sampling, purposive and systematic sampling techniques in this study.



The Oxford Business and Management Dictionary defines proportionate stratified sampling as a probability method in which different strata in a population are identified and in which the number of elements drawn from each stratum is proportionate to the relative number of elements in each stratum. The proportionate stratified sampling is necessary when the study population is heterogeneous, thus, the subjects are to be partition into multiple strata, so that each stratum consists of homogeneous subjects. For the case of this study, four spatial structures or forms, those are: formal, informal settlements, slums and per-urban areas, with heterogeneous data were studied. For the purpose of this study, the Fishers model of (1930) and modified by Kothari, (2004) - proportionate stratified sampling has been adopted. According to Fisher's formula, Kothari's model, any study population of 100, 000 and above should have sample size of 10% of stratum, and therefore, a target population of 50,000, should have sample size of 500. The sample size required for the study was determined by using a 95% confidence level and a sample error of 5% using the Fishers Exact formula for populations larger than or equal to 50,000 as follows: The Fisher's model is stated here below:

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

Where, n is the sample size;

Z , is the z -score corresponding to 95% confidence interval = 1.96;

d , is the amount of discrepancy allowed = 0.014953;

p , is prevalence of land use planning = 0.97;

q = 0.03.

$[(1.96)^2(0.97)(0.03)] \div (0.014953)^2 = 499.975$ which is equivalent to 500 desired sample size.

The sample was proportionately distributed using the formula below: Formal area, Informal Settlements, Slum areas and Pre-urban area population multiply by the sample size divide by the area's population.

Stratum I = Langas $n_1 = [(25,021 \div 50,000)] * (500) = 253$

Stratum II = Kapsaya $n_2 = [(8446 \div 50,000)] * (500) = 84$

Stratum III = Kamukunji $n_3 = [(9188 \div 50,000)] * (500) = 91$

Stratum IV = Kapsaosa $n_4 = [(7345 \div 50,000)] * (500) = 72$

Therefore, $n = n_1 + n_2 + n_3 = 500: 254+84+91+72=500$

Table 2: Sample Size (Based on Stratified Proportional Random Sampling Technique)

Urban Spatial Structure of EUA	Study Area	Measure of Study Area	Population target of Stratum	Sample Size of P=500(N/i) (Proportionate)
Formal Area	Kapsaya	12.1 Ha	8446	84
Informal Settlement	Langas	42.5 Ha	25021	253
Slum Area	Kamukunji	13.7 Ha	9188	91
Per-urban Area	Kapsaosa	34.5 Ha	7345	72
		102.8 Ha		
	Key Informant Interview (KII)			10
	Focus Group Discussion (FGD)			40

Source: Researcher, 2012



Random samples within each stratum were selected from which structured questionnaires were distributed. A subsequent respondent was obtained by skipping every two s. The 500 household respondents were drawn from all the four localities within Eldoret urban area that have been there for the last five years. All the inhabitants were of Eldoret urban were selected in the study through a random sampling method from four sub-urban areas in Eldoret urban region. The sample size for each sub-urban area was calculated to be proportional to the size of the Eldoret urban populations. First, after numbering the sub-urban areas, one of the sub-urban areas was chosen randomly. At the second stage, moving in a clockwise direction from that corner, all households up to the next corner were numbered and one of these, the first unit in the sample was also randomly selected.

Table 3: Stratified Proportional Random Sampling Technique

Stratum	Formal	Per-Urban		
	Informal Slum (Kapsoya)	(Langas)	(Kamkunji)	(Kapsaos)
Population Size	8446	25021	9188	7345
Sampling Fraction	0.1	0.1	0.1	0.1
Sampling Frac. Pop.	845	2582	922	734
Final Sample Size (0.1).	85	254	92	73
Total Sample size	84	253	91	72

(Quantitative data)

Total Sample size 500

(Qualitative data)-Key Informants 40

Focus Group Discussion (for each urban form) 10

Source: Researcher, 2018

Sampling Procedure

A total of 500 households from the four spatial urban structures of slum areas, informal settlements, pre-urban areas and formal area. (Kamukunji, Langas, Kapsaos and Kapsoya) were studied. Questionnaire instruments were used to collect the quantitative data necessary for the study. Stratified Proportional random sampling was used to drive at study sample size, systematic sample framework of 1 respondent out of 100 was used. However, on individual settlement area, a systematic sampling approach was used. This was done stretch from a fixed point. In Kapsoya, Limo House was the starting point counting every 99th person and identifying the 100th one for data collection, which was repeated for the 199th person counted and 200th person identified. In Langas, Corner Mbaya Stage was preferred to be the starting point. Here, 98th person was counted and the 99th person identified to participate in data collection. In Kamukunji 99th person was counted and the 100th one was identified as a participant. Lastly, with the case of Kapsaos, every 101st person was counted and the 102ndth was identified for data collection.

Likewise, purposive sampling technique was applied to select Key Informants and Focus Group Discussion respondents within Eldoret Urban Area. All these exercises resulted in a sample size of 550 used in this study.

Primary Data Collection

This research study made use of questionnaires (closed /open-ended questions), structured interviews and unstructured Focus Group Discussion questions were used to collect relevant primary data from the respondents. Both open ended and closed ended questionnaires were



administrated to the respondents, especially in the slums, informal settlements and pre-urban areas as well as in formal areas of Eldoret Urban Area.

Secondary Data Collection

Secondary data is information that has already been collected for some purpose other than the problem at hand (Mahottra *et al*, 2002). As such, while important to understand the value of secondary data, which may assist to supplement the primary data in answering the research problem. The document analysis secondary data collection method shall be used for the purpose of this study. Therefore, the secondary data, especially on land use planning, and household disaster risk management literature were gathered from the university libraries, internets sources and referred journals relevant to land issues and disaster risk management issues in relationship to socio-economic variables.

Analysis of Data

Questionnaires received from respondents, content analysis and interview schedules were checked for completeness with repeat calls being made for incomplete questionnaires to maintain the number of respondents. Categorization and coding was then done and data entered into SPSS for windows version 21 for analysis. Both descriptive and inferential tests were used in the analysis. Data was described or summarized using descriptive statistics such as mean and frequencies, which helped in meaningfully describing the distribution of responses. Descriptive data and evidence relating to each research question were classified into distinctive classes based on their common qualitative characteristics. Being basically a qualitative research, the results were discussed in a narrative manner. Various inferential statistics was used to infer population characteristics from the sample. Pearson's correlation coefficient was used to establish relationships between variables.

RESULTS

Households Demographic Information

In this study, background information included gender, marital status, and age bracket, highest level of education, household family size, and household family head. These were covered by part A with six statements. The demographic information is important to conceptualize the general picture of any influence on land use planning and household disaster risk management being investigated. The background information of the households enabled the researcher to further make inferences and references to specific features actually collected. According to Urban Land Institute Report (2017) examining demographic, economic and environmental factors that are changing are useful in determining what will be built, where it will be built, and how it will be financed leaving room for other critical social amenities. The results of demographic profile are as shown in Figure 2 and 3.

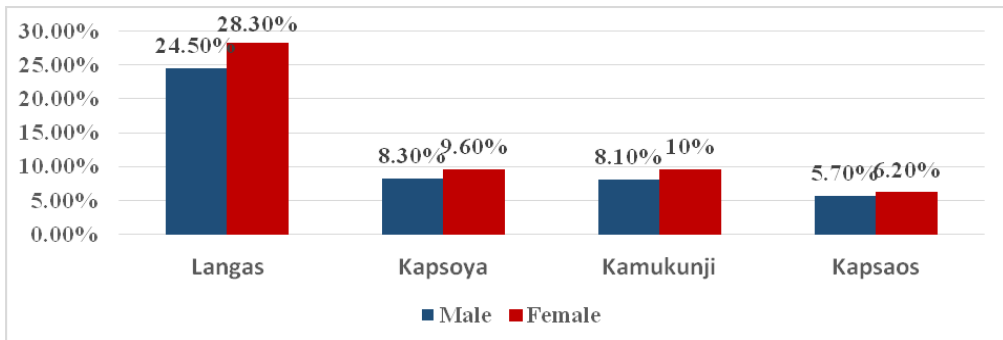


Figure 2: Gender of Respondents

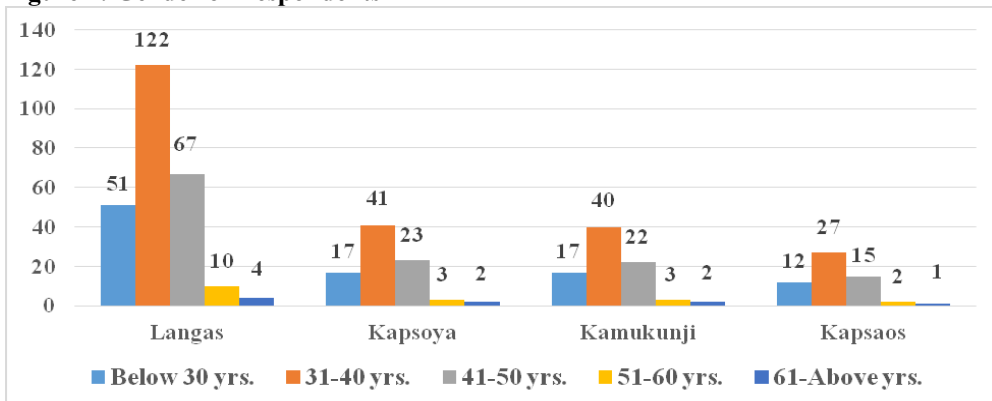


Figure 3: Age Brackets of Respondents

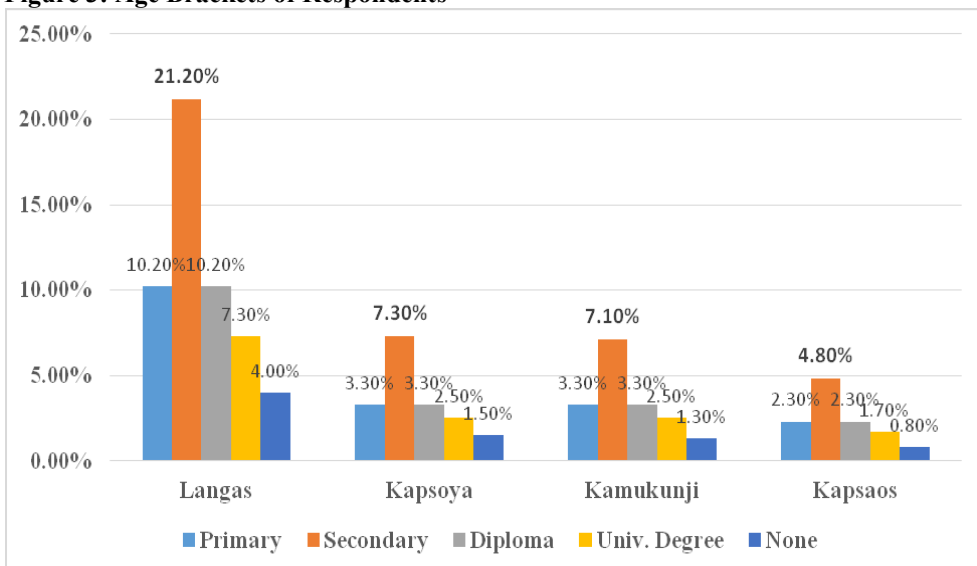


Figure 4: Highest Level of Education of Respondents

Distribution of Respondents Demographic Characteristics in Study Area

The results of gender profile of the sampled households from the four study of-urban areas show in figure 4 indicate that males constitute 224 (46.4%) while females accounted for 257



(53.6%). This is an indication that majority of respondents were females. The results are an indication that female were the majority participants in this study. The dominance of female respondents is not typical of the socio-cultural norms and practices in most Kenyan societies that have high male headed households. These findings do not agree with the findings of Antwi, Boakye-Danquah, Owusu, Loh, Mensah, Boafo, and Apronti, (2015) who found out that male dominance was the majority in their study.

The results shown in figure 4 indicate that, In Langas majority 122 (25.4%) indicated that they were in the age group 31-40 years. In Kapsoya majority 41 (8.5%) indicated that they were in the age group 31-40 years. 40 (8.3%) indicated that they were in the age group 31-40 years in Kamukunji while 27 (5.6%) shows that they were in their 31-40 years from Kapsaos. In General, 230 (47.8%) indicated that they were in the age group 31-40 years. The results show that everyone was given a chance to participate in the study and had the opportunity to voice their views.

This infers that the sampled household respondents were in their prime middle age or youthful age, between 31 -50 years. This is the trend in most Kenyan urban societies where the population is fairly young as majority of respondents were between 31-50 years accounting for 357 (74.2%). These demographic trends are largely a reflection of trends in the study areas as reported during the National Population Census 2009.

Such a middle prime age has so much socioeconomic needs require proper planning for disaster risk management targeting the youth. This age group is prone to hazards such as drug abuse, crime, especially slum related, unemployment, school drop outs, unplanned early marriages and sexually transmitted infections. If not checked, these hazards can lead to disasters that may have impact on households.

All the sampled household respondents also had low level of formal education. In Langas majority 102 (21.2%) who participated in the study are currently graduates with secondary education consisting of form four or o-level certificate. In Kapsoya majority 35 (7.3%) indicated that their highest level of education by the time of survey was secondary education. In Kamukunji while 34 (7.1%) shows that they had secondary level of education certificate while 23 (4.8%) respondents from Kapsaos too indicated that their highest level of education is secondary. In General, 194 (40.3%) indicated that they attained the secondary level of education leaving the rest to be distributed among Primary, Diploma and university degree levels. The results shown in Table 4 are the evidence of the number of household participants in the study constituting secondary level of education.

Education is said to equip people with knowledge and skills that are useful in understanding the importance of disaster risk management. However, with only secondary education, the households who participated in this study may not own adequate knowledge and skills to enable them take precautionary measures on disaster risk management. Having low level of education leaves the households with inability to make well informed decision on disaster risk management, leaving the households with less strategic options to deal with disasters. This would expose them to hazards common in unplanned areas, hence increasing chance of disaster risks levels. These results are in agreement to the results by Saunders and Beban, (2012; 2015 and 2016). The results of these studies indicated that education is useful for natural hazard risk reduction.



Likewise, Ludwig *et al.*, (2011) and Stobbe (2011), in their study, found out that better educated people normally live in wealthier neighborhoods since they are generally more conscious of taking care of their health and general welfare including living standards compared to households with low level of education. Thus sustainable household disaster risk management, better education is essential.

Effects of Urban Land Use Regulatory Instruments on Household Disaster Risk Management in Eldoret Urban Area

Urban land use planning regulatory instruments can be explicit. Explicit instruments are those specifically designed to shape cities for example urban zoning mechanisms or innovative financing of urban roads in specific city. Implicit instruments are those that shape a city as an externality, for example a large scale increase in petroleum tax by a national government would result in more compact cities. Land use regulations are critical for negotiation among public sector and private stakeholders, buildings sitting and space, building codes and energy traffic calming, utilities and facilities, lot requirement and building materials. This is a control approach used to cause restriction to achieve a smooth and visual skyline and to prevent tall buildings from blocking the view of shorter buildings and the sunlight from reaching them. It aims to protect shorter buildings from being overshadowed by taller buildings. This ensures that buildings must conform to the code to obtain planning permission, usually from a county authority. It is aimed at protecting public health, safety and general welfare as they relate to the construction and occupancy of buildings and structures. The results from sampled respondents are as shown in Table 5.

The results from Table 5 show that the regulatory instruments have shown a large deviation. It shows a mean influence of 4.24%, the maximum reported influence is 69.0% and the minimum is -48.8% with deviation of 9.32 between the households from sampled study areas. The mean of regulatory instruments is 4.24, with the maximum and minimum are 69 and -48.8 respectively.

These results also indicate that the building and construction permits have shown a small deviation. The mean of building and construction permits is almost 57.7%, which is 57.7% of influence on household disaster risk management leaving the rest 42.3% be influenced by other factors.



Table 5: Distribution of Elements of Regulatory Instruments (LUPRI)

Variable	N	Range	Min	Max	Mean	Std. Error	S.D	Var
	Stat	Stat	Stat	Stat	Stat	Stat	Stat	
LUP-RI	481	79.20	- 48.8	69.00	69.00	1.03	9.32	95.10
Floor Area Ratio and Height Limitations	481	5.48	3.11	4.15	3.231	0.732	0.677	0.419
Building and Construction Permits	481	4.61	1.88	2.87	4.52	0.557	1.184	2.581
Open and Green Space Protection	481	5.10	1.74	3.84	8.133	0.587	1.154	2.363
Agricultural Land Conservation	481	6.14	1.56	2.98	8.120	0.668	1.165	2.541
Construction and Building Standards	481	6.10	1.45	2.86	8.120	0.848	1.174	2.333
Enforcement of Property Rights	481	0.70	0.90	0.25	0.567	0.421	0.186	0.456
Right-of-Way Protection	481	7.13	3.18	3.57	0.436	0.461	0.264	0.643
Buildings Sitting and Space	481	4.84	2.99	4.98	5.100	0.626	0.647	0.310
Building Codes and Energy Traffic calming	481	5.96	2.65	3.55	6.245	0.516	1.312	2.540
Utilities and Facilities	481	5.33	3.18	4.52	0.314	0.601	0.533	0.621
Lot Requirement	481	5.66	2.65	3.53	6.255	0.578	1.321	2.521
Building Materials	481	5.76	2.65	3.58	6.255	0.565	1.342	2.564
Height Restrictions	481	5.15	3.92	5.24	6.451	0.647	0.179	0.357

The floor area ratio and height limitations implies that urban land planning regulation considers the kind of building in certain area to be of specific standards of reference such as floor area and the height limitations. The mean of floor area ratio and height limitations is almost 73.2%, which is 73.2% of influence on household disaster risk management leaving the rest 26.8% be influenced by other factors.

The open and green space protection of the regulatory instruments shows an experience of annual frequencies of a maximum of three times influence in household disaster risk management. This implies that open and green space protection registered quite a small number of influences. The mean of agricultural land conservation on the regulatory instruments is only about 66.8%, which is 66.8% of the regulatory instruments influence on household disaster risk management leaving 33.2% to be influenced by other factors.

The construction and building standards of the regulatory instruments indicate an experience of annual frequencies of a maximum of participation. This implies that construction and building standards registered quite a small number of influences of regulatory instruments. The mean of construction and building standards is 84.8%, which is 84.8% of the Regulatory Instruments. The enforcement of property rights of regulatory instruments shows an experience of annual frequencies of a maximum of four times influence of the Regulatory Instruments. This implies that enforcement of property rights registered quite a small number of degrees of influence of the total regulatory instruments influence on household disaster risk



management. The mean of enforcement of property rights of the regulatory instruments is only about 56.7%, which is 56.7% of the household disaster risk management. Finally, the results indicate that the right-of-way protection has shown a smaller deviation. The mean of right-of-way protection is almost 43.6%, which is 43.6% of influence on household disaster risk management leaving the rest 57.4% be influenced by other factors.

Furthermore, the results from Table 5 show that the building construction restriction has shown a moderate deviation of 11.13% among the sampled household from the study locations. It shows a mean influence of 5.382%, the maximum reported influence is around 56.0% and the minimum is -40.0% with deviation of 11.13 between sampled household respondents. Building sitting and space shows an experience of annual frequencies of a maximum of five times and a minimum of three times the influence in the total degree of influence of building construction restriction.

The mean of building sitting and spaces is 62.6%, which is 62.6% of influence of the total influence of building construction restriction on household disaster risk management leaving the rest 37.4% be influenced by other factors not covered in this study. The Building Codes and energy traffic calming of the building construction restriction shows an experience of annual frequencies of a maximum of four times influence with a minimum of three levels of experiences. This implies that building codes and energy traffic calming registered quite a moderate level of influences. The mean of building codes and energy traffic calming influence is only 51.6%, which is 51.6% of the building construction restriction influence on household disaster risk management levels.

The utilities and facilities indicate an experience of annual frequencies of a maximum of five times and a minimum of three times the level of influence. This implies that the utilities and facilities registered quite a moderate level of influences on the board effects on urban land use planning approaches. The mean of utilities and facilities is 60.1%, which is 60.1% of the total building construction restriction influence on household disaster risk management. The Lot requirement indicates an experience of annual frequencies of a maximum of five times and a minimum of three times level of influence. This implies that Lot requirement registered quite a large level of influence of the total building construction restriction influence on household disaster risk management. The mean of lot requirement of the board is only about 57.8%, which is 57.8% of the household disaster risk management.

The building materials indicate an experience of annual frequencies of a maximum of six times and a minimum of four times level of influence. This implies that building materials registered a high level of influence of the total building construction restriction influence on household disaster risk management. The mean of building materials of the building construction restriction is only about 56.5%, which is 56.5% of the household disaster risk management.

The height restrictions indicate an experience of annual frequencies of a maximum of six times and a minimum of four times level of influence. This implies that height restrictions registered a high level of influence of the total building construction restriction influence on household disaster risk management. The mean of height restrictions of the building construction restriction is only about 64.7%, which is 64.7% of the household disaster risk management.



Regulatory Instruments Influence

This study sought to obtain information relating to urban land use planning regulatory instruments. This was considered critical in understanding further its function in altering land use to determine the urban form and land utilized by the public sector, private sector and urban household actors. The results are as shown in Table 6.

Table 6: Distribution of Regulatory Instruments Influence

Statement		SD	D	A	SA	Total
Establishes an invaluable floor area ratio and height limitations that ensure buildings are constructed in a standard form and format in specific areas	f	43	72	178	188	481
	%	09.0	15.0	37.0	39.0	100
Provides building and construction permits on approval for conformity and compliance control to the rules and laws	f	111	14	154	202	481
	%	23.0	03.0	32.0	42.0	100
Ensure that open and green space protection is achieved and maintained	f	82	111	101	188	481
	%	17.0	23.0	21.0	39.0	100
It ensures that agricultural land conservation is equitable and adequately provided	f	63	91	91	236	481
	%	13.0	19.0	19.0	49.0	100
Have invaluable skills to maintain construction and building standards so that quality and quantity is maintained for particular zones	f	91	72	149	168	481
	%	19.0	15.0	31.0	35.0	100
Represents enforcement of property rights	f	72	82	149	178	481
	%	15.0	17.0	31.0	37.0	100
High level of right-of-way protection is maintained	f	96	72	135	178	481
	%	20.0	15.0	28.0	37.0	100

The results in Table 6 show that that strongly agree accounted for 188 (39.0%), agree 178 (37.0), disagree 72 (15.0%) and strongly disagree 43 (09.0%) with the statement that establishing an invaluable floor area ratio and height limitations that ensure buildings are constructed in a standard form and format in specific areas. This implies that majority, strongly agree 188 (39.0%) and agree 178 (37.0%) that establishing an invaluable floor area ratio and height limitations that ensure buildings are constructed in a standard form and format in specific areas.

The next item of regulatory instruments was that providing building and construction permits for approval for conformity and compliance control to the rules and laws. The results show that strongly agree accounted for 202 (42.0%), agree 154 (32.0%), disagree 14 (03.0%) and strongly disagree 111 (23.0%) that providing building and construction permits for approval for conformity and compliance control to the rules and laws. This implies that majority, strongly agree 202 (42.0%) and agree 154 (32.0%) that providing building and construction permits for approval for conformity and compliance control to the rules and laws. Moreover, it was shown that strongly agree accounted for 188 (39.0%), agree 101 (21.0%), disagree 111 (23.0%) and strongly disagree 82 (17.0%) that they ensure that open and green space protection is achieved and maintained. This implies that majority, strongly agree 188 (39.0%) and agree 101 (21.0%) that ensure that open and green space protection is achieved and maintained.



Apart from that, the study also asked to find out if they ensure that agricultural land conservation is equitable and adequately provided. In Table 6, the results show that strongly agree accounted for 236 (49.0%), agree 91 (19.0%), disagree 91 (19.0%) and strongly disagree 63 (13.0%). This implies that majority, strongly agree 236 (49.0%) that ensures that agricultural land conservation is equitable and adequately provided.

In relation to participants having invaluable skills to maintain construction and building standards so that quality and quantity is maintained for particular zones, results in Table 6 show that strongly agree accounted for 168 (35.0%), agree 149 (31.0%), disagree 72 (15.0%) and strongly disagree 91 (19.0%). The results are an indication that majority agree at 168 (35.0%) that participants having invaluable skills to maintain construction and building standards so that quality and quantity is maintained for particular zones, the results also show that strongly agree accounted for 178 (37.0%), agree 149 (31.0%), disagree 82 (17.0%) and strongly disagree 72 (15.0%) that regulatory instruments is useful in represents enforcement of property rights. This is an indication that majority who agree at 178 (37.0%) are of the opinion that the regulatory instruments is useful in represents enforcement of property rights.

This question sought to establish if high level of right-of-way protection is maintained. The results show that strongly agree accounted for 178 (37.0%), agree 135 (28.0%), disagree 72 (15.0%) and strongly disagree 96 (20.0%). This implies that majority, strongly agree 178 (37.0%) and agree 135 (28.0%) that high level of right-of-way protection is maintained.

These results concur with the findings of Moreles, (2013) who found out that regulatory instruments help in creating and managing land use practices and their choices among specific growth management policy instruments determining how land use policy choices are shaped by institutional features of national and county governments and the household demands. That these regulatory instrument decisions reflect a balance of the conflicting interests and responses to socioeconomic and environmental pressures.

The results indicate that land use regulatory instrument of land use planning component has an influence on disaster risk management. Thus county governments could make use of land use planning regulatory instrument to provide quality standard housing units suitable for occupation. This means that hazards and vulnerability to collapsing buildings, sinking buildings, houses constructed under high voltage power lines, are not going to be experienced. Moreover, problems related to housing crowding leading to high density populations in small areas will be eliminated. Once such order has been maintained, then space for expansion and recreation will be restored and access roads will be working hence in event of any emergencies, accessibility to rescue will be possible. Such an environment will attract investment of high standards quality such as an academy, for example, in Elgon View estate, there are various good schools such as Testimony, high class guest houses, Boma Inn and health facilities and others. But in places like Kamkunji, Langas, there are only public schools that are overcrowded, lack adequate and well stocked health facilities, low quality and quantity housing.

Effect of Land Use Planning Regulatory Instrument of Urban Land Use Planning on Household disaster risk management

The study also sought to establish if there was a relationship between Land use planning regulatory instrument and Household disaster risk management. Relationship was tested using T regressing LUPRI and Household disaster risk management guided by the equation: $\gamma =$



$\beta_0 + \beta_1 LUPRI$: Where LUPRI represented Land use planning regulatory instrument and γ denotes HDRM. The results of the regression are presented in Table 7.

Table 7: Effect of Land Use Planning Regulatory Instrument of Urban Land Use Planning on Household disaster risk management

Model Summary	R	R ²	Adjusted	Std. Error of the
Model	Estimate			Durbin-Watson
1 R ²	0.784 ^a	.615	.445	.1032843
				1.6418

^a. Predictors: (Constant), Floor Area Ratio and Height Limitations, Building and Construction Permits, etc.

^b. Dependent Variable: HDRM

Model	Coefficients ^a				
	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	
Model Summary	β	Std. Error	Coefficients Beta		
1 (Constant)	.687	.044		-16.015	.000
KC	1.482	.060	.878	20.901	.000

^a. Dependent Variable: HDRM

$$\gamma = \beta_0 + \beta_1 LUPRI = .687 + 1.482 LUPRI$$

ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	4.494	1	4.494	436.858	.000 ^b
Residual	3.052		.481	.013	
Total	7.849		125		

^a. Dependent Variable: HDRM

^b. Predictors: (Constant), LUPRI

Residuals Statistics

Minimum	Maximum	Mean	Std. Error	Std. Dev	N
Predicted Value	.028314	.421485	.205132	.1451186	481
Residual	.4120858	.2454981	0E-7	.1001964	481
Std. Predicted Value	1.780	1.650	.000	1.000	481
Std. Residual	3.933	2.343	.000	.967	481

^a. Dependent Variable: HDRM

The results presented in Table 7 show that the effect of Land use planning regulatory instrument on HDRM was significant positive ($R = 0.784$). This was an indication that Land use planning regulatory instrument explained 78.4% ($R^2 = .615$) of HDRM. The other variables in the urban areas explained the remaining 21.6%. The analysis from the model had the F value of 426.8. At p-value less than 0.05, the findings thus were sufficient to support effects of Land use planning regulatory instrument and building construction restriction on Household disaster risk management, implying that Land use planning regulatory instrument and building



construction restriction had statistically significant positive effects on Household disaster risk management. The results indicate that there was a significant positive relationship between LUPRI and Household disaster risk management activity level. The urban areas under study with longevity of tenure creating Land use planning regulatory instrument and building construction restriction score tended to have higher level of Household disaster risk management. $\gamma = \beta_0 + \beta_1 LUPRI = .687 + 1.249 LUPRI$; if LUPRI is zero γ will be 1.936 unit level of Household disaster risk management while if LUPRI is 10; γ will be $0.878 + (1.482 * 10)$ which was equal to 13.238 showing an increasing effect of LUPRI on HDRM. The hypothesis that there is no relationship between Land use planning regulatory instrument and Household disaster risk management was therefore rejected. The results were not consistent with the study conducted by Coulombel, (2010) who reported that there is a positive relation between ownership concentration and urban areas household disaster risk management.

These findings were not in agreement with the findings of Shreve & Kelman, (2014) who found out that there was a significantly positive relationship between urban land planning component of regulatory instrument and building construction restrictions and Household Disaster Risk Management activity level as measured by HDRM. The results were consistent with the study conducted by Shreve & Kelman, (2014), they argued that specific components of urban planning management can be used by increasing buildings sitting and space, building codes and energy, traffic calming, utilities and facilities, lot requirement, building materials and height restrictions to ensure strict policy and procedure observation for any structures being constructed in urban areas. This would create sanity and minimize triggering hazards into becoming disaster risks as currently the practice.

CONCLUSION

The study concludes that household disaster risk management preparedness is low in Eldoret Urban Area. Age of household heads, education, monthly income, household warning system, knowledge on disaster risk preparedness, prior exposure of disaster risks, and duration of disaster were significantly associated with household disaster risk preparedness.

The findings provided a proof that land use planning regulatory instruments have influence on disaster risk management since it contributes to the improvement or decrease in the disaster risk management dimensions and an indication of its significant positive magnitude effect. The application of the regulatory instruments in this case includes the application of physical planning Act of 1996, the building codes, as well as the public health Act. All these would determine the household behavior with regard to the plot size, the Floor Area\ Ratio, the building standard, the housing quality and quantity and the general environment, especially, in areas where land use planning is applicable. There was enough evidence from the findings with strong evidence of proof to conclude that regulatory instruments have a relationship to disaster risk management.

RECOMMENDATION

County government should strictly enforce regulatory instruments regarding land use planning to ensure compliance practices are maintained. This would control of certain unwanted sprawling slums and informal settlements that are hazardous



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