Compliance with the Planning Standards in Regulating Building Lines. The Case of Kisii Town, Kenya

Wilfred Ochieng OMOLLO*[1]

* Corresponding author
[1] *Kisii University, Department of Planning and Development, Kisii, KENYA*
E-mail: wochieng@kisiiuniversity.ac.ke

A B S T R A C T

Planning standards provide a basis for controlling land use to attain orderly spatial development. This study examined the extent to which developments in Kenya have been complying with the planning standard on building lines, having Kisii town as a case study. It also investigated the factors contributing to the observed non-compliance. The analysis was based on the public interest theory of regulation. A sample size of 364 residential developments was randomly and proportionately drawn from the seven neighbourhoods. Remote sensing and questionnaires were used to collect data and thereafter analyzed using GIS, descriptive and inferential statistics. Research findings disclosed that most residential developments did not comply with the recommended building lines. The results of hypothesis similarly confirmed low compliance that was statistically significant. Non-compliance was found to be caused by the failure of the County Government of Kisii to ensure that developers obtained the obligatory development permissions in addition to meeting other requirements namely using registered professionals and ensuring regular inspection of buildings during construction. Also, the interpretation of the applicable planning standards of building lines by the County Government when approving building plans was misleading and eventually contributed to non-compliance. These problems ensue due to insufficient development control, therefore contributing to unsustainable spatial development. This study addresses a critical issue in spatial planning practice and aims to contribute to the specialist literature by demonstrating how compliance with the planning standards that regulate building lines may be statistically and spatially evaluated.

1. INTRODUCTION

Most countries in Africa are witnessing rapid urbanization, a trend that has given rise to the proliferation of unplanned settlements. The current population of 1.3 billion people on the continent in 2020 is projected to double by 2050, over 80% of whom will be residing in urban areas. This is an indication that countries should develop strategies that would guarantee a suitable environment for their citizens to comfortably live and work (Muggah and Hill, 2018). This may, however, not be accomplished if land-use regulation is not prioritized as one of the pillars of economic development by sternly enforcing building development control regulations (Atamewan, 2019; Olujimi, 1992). Such failures eventually present challenges in the implementation and enforcement of planning standards mostly in the cities of the developing countries (Keivani, 2010).

A standard is a document unanimously established and ratified by a recognized institution that provides for mutual and recurrent use, rules, guidelines or characteristics for activities or their results, aimed at attaining the optimum degree of order in a given context (International Organization for Standardization, 2020). It measures quality or the

requisite degree of excellence (Arku et al., 2016; Olujimi, 2008). Planning standards, therefore, denote the regulatory measures that are established by planning authorities to control land use development (Omollo, 2020a; Clarke 1994). The target is that developers should not perform below the minimum standards (for instance, 50% of the building coverage ratio), though the target is usually the upper limit. They embody statutory instruments that are premeditated to safeguard, regulate, conserve and distribute land in the interest of the public together with controlling the character, appearance and arrangement of buildings and facilities (Kabando and Pu, 2014; Otieno, 2012; Onokerhoraye and Omuta, 1986; Agbola, 1985).

Planning standards are also known to set the lawful limits of the use of public and private land to attain a spatial structure that promotes the development control principles of safety, access, conservation, conformity and compatibility (Omollo, 2020b; Omollo et al., 2018, Makato, 2013). However, as observed by Akeem et al. (2018), weak implementation of planning standards due to insufficient administrative and political goodwill undermines the implementation of approved land use development plans.

From the foregoing, this study has two objectives. First, to explore the extent to which residential developments in Kenya, namely in Kisii town, comply with the planning standards that regulate building lines. Second, to examine the factors that influence the non-compliance with the recommended building lines in Kisii town. The study also tests the hypothesis that there is no statistically significant difference between the recommended planning standards on the building lines and the observed extent of compliance in the case of residential developments in Kisii town. The variable "building line" was operationalized as defined under the Physical Planning (Building and Development) (Control) Rules in 1998 (the Government of Kenya, 1998) to mean, *a line is drawn across a plot such that no building or permanent structure (except a wall of approved design) may be constructed between that line and the road fronted by the plot.*

The current study was motivated by three emerging issues. First, although the county governments in Kenya are mandated to undertake development control, they often lack empirical evidence on the extent to which the planning standard on building lines are complied with by developers. Second, the literature is scarce on how compliance with building lines may be analyzed statistically and spatially. The current study sought to fill this gap. Third, for the County Government of Kisii (CGOK) and other key policy formulating bodies to effectively discharge their legislative or policy formulation role, they require evidence supported with a sound theoretical underpinning on what prompts developers not to comply with the planning standards. The study,

therefore, sought to provide a point of reference for drafting key legislation and policies that may influence the regulation of buildings development.

A growing body of literature states that developers seldom comply with planning standards. For instance, Kumar and Pushplata (2017) found out that the recommended building coverage ratio in Shimla, India, exceeded the prescribed planning standard resulting in lesser open space that could not support landscaping, recreation, and plantation purposes. In Hong Kong, Yau et al. (2009) observed that unauthorized external walls of buildings posed serious threats to the safety of the community since 98% of them were constructed without approval from the planning authority. A contrasting study by Kumudini and Wickramarachchi (2018) in Galle Fort-Sri Lanka, a United Nations Educational, Scientific and Cultural Organization heritage site established that 7.23% of developers disregarded the recommended maximum building height standard of 10 floors under the pretext that such regulation would hinder the attraction of tourists.

According to Kamarulzaman et al. (2019), although planning standards should also apply to the renovation of buildings, this was not the case in Malaysia owing to weak enforcement along with limited collaboration between policy makers and practising professionals. In a related study in the city of Old Salt, Jordan, Alnsour and Meaton (2008) found out that level of public awareness regarding planning standards did not translate into compliance. Key variables that influenced compliance comprised enforcement, monitoring, size of the households and their average monthly income. The findings are in line with that of by Arku et al. (2016) who revealed that although developers in Accra city, Ghana, were aware of the building regulations, this did not contribute to compliance during construction. On the contrary, Hameed and Albazaz (2019) established that the level of awareness of developers influenced compliance with the planning standards in the city of Baghdad. The study, however, agrees with that of Alnsour and Meaton (2008) that income level influences compliance.

Studies have also been undertaken in Africa to determine the extent of compliance with planning standards. Sylvester (2014) established that 60% of developments in Makurdi town, Nigeria, contravened the approved development plan, in which case 57% of the non-compliance was related to residential construction. Further, in Nigeria, Obongha et al. (2016) found out that most buildings disregarding standards such as setbacks, building lines, and building coverage ratio. In Uganda, Goodfellow (2013), through a case study, argued that planning standards were more enforced in Rwanda than in Uganda due to a positive culture. According to Windapo and Cattell (2010), developers in South Africa rarely comply with planning standards due to inadequate professional qualifications

of site managers, an argument supported by Omollo (2019) who established that the construction industry in Kisii town, Kenya, faced challenges in regulation because of contractors who had no formal training in building construction.

Further in Kenya, Makato (2016) found a negative correlation between building lines and the building coverage ratio in Kitengela town. As the building line increased, the building coverage ratio conversely decreased. Compliance was low due to inadequate supervision and inspection of buildings under construction by the County Government of Kajiado. A related study in Eldoret town by Ngetich et al. (2016) established that 12% of the buildings violated the minimum building line of 3 metres. Similarly, 49% encroached on the distance between the fence on both sides of the plot and the walls of the buildings.

From the reviewed literature, though it is apparent that planning standards are infrequently complied with, there is a scarcity in knowledge on how compliance with the standard that regulates building lines may be statistically and spatially analyzed. Besides, in the case of previous studies attempting to establish that standards of building heights, setbacks and building lines were disregarded, the adopted methodologies were descriptive, with no attempt to incorporate field measurements to spatially quantify the extent of non-compliance. The current study aimed to fill this gap by working on quantifiable observations through onsite measurements. This approach was adopted because it depicts the magnitude of the problem by accurately demonstrating the extent of compliance with the recommended planning standards. The study was guided by the theory of regulatory compliance that advocates for regulation in a market economy.

The paper is organized into four sections, addressing different, but related aspects. The first section presents an introduction that covers study objectives, hypothesis, a justification for undertaking the study and literature review. While the second section is focused on theory and methodology, the third section delves on the results and discussions of the research findings. The fourth section presents a conclusion based on the stated objectives. It also highlights the policy implications of the research findings in addition to the proposed recommendations towards compliance with the recommended building lines in Kisii town.

2. THEORY AND METHODOLOGY

2.1. Theory

This study was guided by the Theory of Regulatory Compliance (TRC) which supports the need to comply with regulations. The theory materialized in the 1970s when its protagonists argued that compliance with the sanctioning rules or regulations significantly contributes to positive results (Fiene, 2016). In the current study, the theory reinforces why developers in Kisii town should comply with the planning standard that regulates building lines. To link the theory with the applicable legislative framework in Kisii town, Rule 12 (2) (a-b) of the Physical Planning Rules of 1998 (Building and Development) (Control), issued by the Government of Kenya (1998) as legal notice number 135/1998 has set the minimum width of building lines that developers ought to comply with. To ensure the implementation of this regulation, section 56 (a) of the Physical and Land Use Planning Act (PLUPA) (the Government of Kenya, 2019) gives the county governments the power to control the use and development of land and buildings to ensure orderly development. Since the CGOK is the statutory planning authority in Kisii town, it ought to take advantage of the stated provision in the PLUPA to enforce the requirements of the legal notice 135/1998 on building lines through development control. This underpins the application of the TRC in enforcing compliance with the planning standards that regulate building lines in Kisii town.

2.2. Methodology

2.2.1. Research design and philosophy

This study adopted a case study research design to provide an in-depth analysis of the extent to which residential developments are complying with the planning standard on building lines in Kisii town, Kenya (Fig. 1).
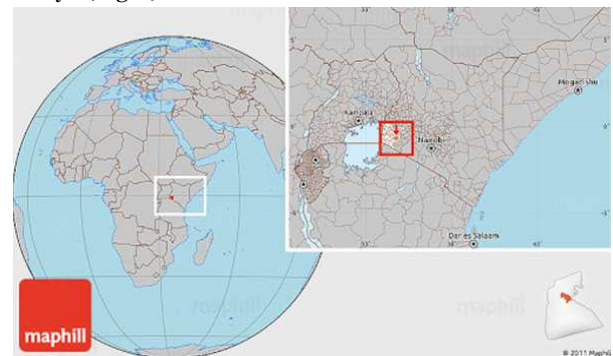

Fig. 1. Location of Kisii town in Kenya and Africa *(source: Maphill, 2020).*

The research covered seven neighbourhoods, namely: Jogoo, Nyamataro, Egesa, Mwembe, Daraja Mbili, Mwembe and Nyamage. Kisii town was chosen as a case study because of three major reasons. First, in the regional setting, it is the most densely populated urban area in the western part of Kenya, with 2,862 persons/km². This is higher than Kisumu (464 persons/km²) which is the third-largest city in Kenya (Kenya National Bureau of Statistics, 2019). Second, in the national context, Kisii is ranked as the third most

densely populated urban area after Nairobi City County (4,515 persons/km²) and Mombasa County (4,292 persons/km²). Third, according to the Kenya National Bureau of Statistics (2019), the town's annual population growth rate of 2.7% is ranked among the highest in Kenya, in fact, higher than the national average of 2.6% per year.

The town is geographically positioned in the south-western part of Kenya and currently designated as the administrative headquarters of Kisii County, one of the 47 county governments in the Government of Kenya.

The current study followed the positivist research philosophy, which relies on a deductive method of inquiry through data collection and hypothesis testing. This was attained by working on quantifiable and measurable observations, along with statistical analyses. The emphasis was on replication, meaning that other researchers can find similar results. In this case, compliance with building lines was measured per residential building. According to Leedy (2005), replication is the ultimate test of knowledge since positivists uphold that different groups of observers looking at the same facts should obtain the same results.

2.2.2. Population, sample size and sampling design

An immediate challenge faced before commencing the collection of primary data was how to obtain a readily available sampling frame that could also be used to determine the population size for each residential neighbourhood in the study area. This was because the CGOK did not maintain a record of the spatial location of residential developments in Kisii town. To overcome this limitation, the study relied on the recommendation made by Escamilla et al. (2014) that high-resolution satellite images alongside geographic analysis software may be used to digitize each building development within an area of interest to generate an accurate list in the form of a representative sampling frame, which can then be used to draw random samples. Based on this commendation, all buildings were first identified using a high spatial resolution satellite image (pre-processed QuickBird-2, 0.34-meter spatial resolution) obtained from the Regional Centre for Mapping of Resources for Development, Nairobi, and subsequently digitized using QGIS 3.6.3-Noosa software to establish a sampling frame in the form of the feature attribute table.

The GIS analysis process entailed the delineation of neighbourhood boundaries, followed by the digitization of all building developments. This was accomplished through a deliberate participatory mapping exercise that involved the Assistant Chiefs drawn from sublocations where each of the seven neighbourhoods were located, consequently giving credence that there were no overlaps in data collection.
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As justified by Warner (2015) and Natarajan (2017) in their studies, such participatory mapping has the advantage of collecting and consolidating local knowledge from different people to create a comprehensive base map that provides an in-depth knowledge than can be attained from traditional mapping techniques. To ensure that all of the mapped buildings were residential, a two-week ground validation exercise was undertaken in each residential neighbourhood. In the end, 7,430 houses were successfully mapped.

This formed the target population in addition to providing the sampling frame that was a requisite for primary data collection as shown in Table 1.

Table 1. Population and sample size per neighbourhood/stratum *(source: field survey data, 2020).*

Neighbourhood/ stratum	Mapped houses	Sample size
Jogoo	1,551	75
Mwembe	1,105	54
Nyamage	1,171	57
Nyanchwa	673	33
Nyamataro	808	40
Egesa	821	40
Daraja Mbili	1.301	64
Total	7,430	364

The determination of the total sample size (364) was undertaken using the Sample Size Determination Table recommended by Krejcie and Morgan (1976). According to their view, if the population (N) falls between 7000 and 7999, the sample size (n) should be 364. Having determined the overall sample size, each neighbourhood was considered a stratum and a proportional random sampling was used to determine their sample size. In this case, the number of buildings from each neighbourhood was divided by the total number of buildings for all the neighbourhoods (7,430) and the product multiplied by 364 (Table 1, Fig. 2). Samples were afterwards randomly drawn using a random number table generated using the Microsoft Excel software, version 2013. This gave credence that the samples were an accurate depiction of the population in the study area.

2.2.3. Data collection and analysis

A questionnaire was used to collect data from the owners of the sampled residential developments. It contained questions related to matters such as the name of the residential neighbourhood, and whether the developer met the basic requirements, namely: a) obtaining development permission, b) contracting a registered professional in design, c) their building was inspected during construction, and d) obtaining a certificate of completion from the CGOK.

The questionnaire had also a checklist that was used to record the observed extent of compliance with the recommended building lines. This checklist was structured into four sections. While the first one consisted of the name of the residential neighbourhood, the second and third sections were assigned for measurements of the recommended building line (in metres) and the observed/measured building line (in metres). The difference between the recommended and observed/measured compliance was recorded in the fourth section. From this background, a positive deviation indicated non-compliance, while a negative deviation or zero, suggested spatial compliance. To determine the extent of compliance with the recommended building lines, registry index maps/survey maps covering each neighbourhood was acquired from the Kisii County Survey Office. This was crucial since such survey maps indicate the area of each land parcel and the widths of their access roads. The maps were then scanned, georeferenced and overlayed with the satellite images that contained the mapped residential buildings per neighbourhood (Fig. 2).
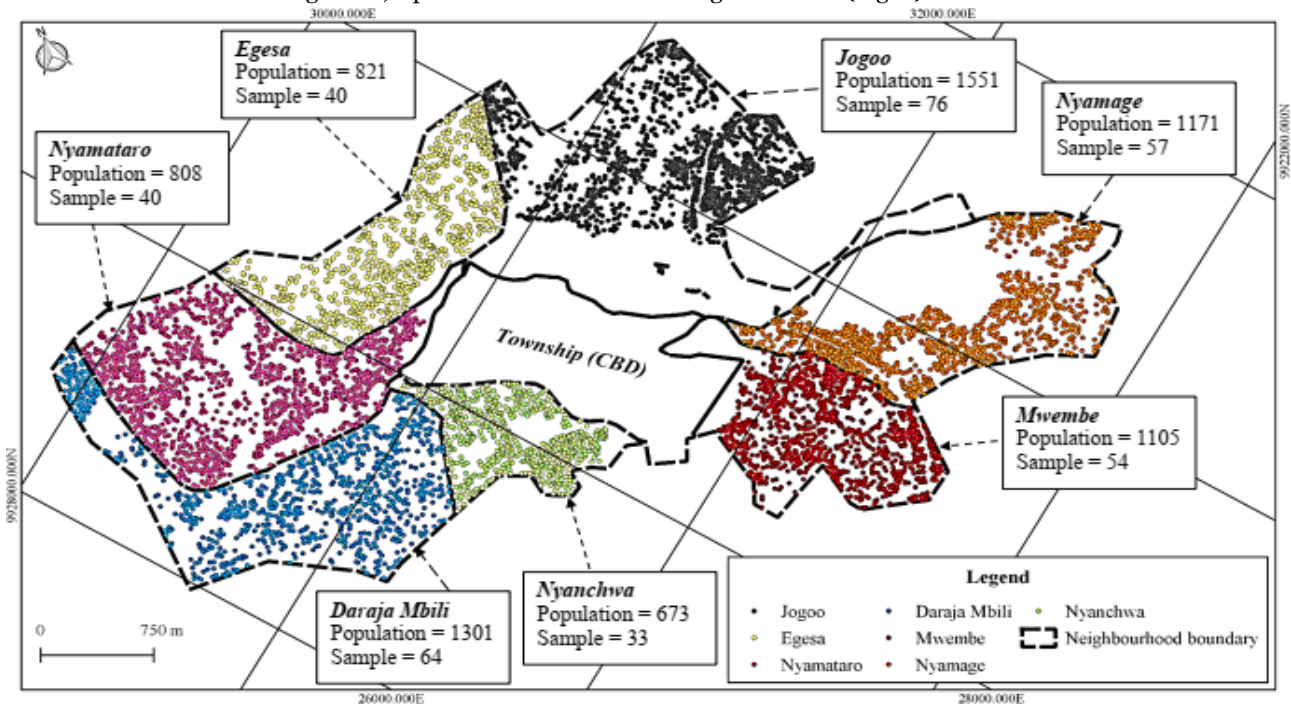

Fig. 2. Mapped residential developments forming the sampling frame/study population *(source: the author, based on field survey data, 2020).*

After determining the width of access roads, site measurements were undertaken to establish if the sampled buildings that fronted the roads had complied with the recommended building lines. These measurements were further validated through the application of buffers that were generated using the spatial analysis function of the QGIS 3.6.3-Noosa software. As mentioned in the introduction section, a building line is drawn across a plot such that no building or permanent structure (except a wall of approved design) may be constructed between that line and the road fronted by the plot (Fig. 3). As a consequence, according to Rule 12 (2) of the Physical Planning (Building and Development) (Control) Rules, 1998 (the Government of Kenya, 1998), a) where roads range between 6 to18 metres in width, the building line shall be of 6 metres, and b) for any road above 18 meters in width, the building line shall be of 9 metres.

The present study, therefore, sought to determine if residential developments in Kisii town were complying with these planning standards. An illustration of the building line as a planning standard is presented in Figure 3.
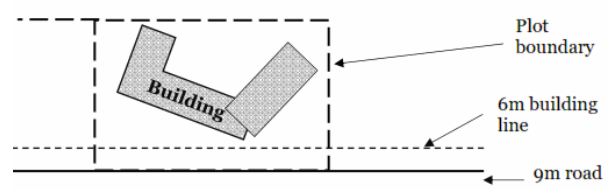

Fig. 3. An illustration of building line planning standard.

During data collection, in the case the sampled respondents were tenants, the contacts of the landlords were obtained from them and the landlords were contacted later for data collection. The collected data were analyzed using descriptive statistics (means, mode, standard deviation, cross-tabulation, percentages), inferential statistics (Pearson's bivariate correlation, paired sample t-test, and one-sample t-test). The reliability of the questionnaires was confirmed using the test re-test method through a pilot study. The Shapiro-Wilk test was used to assess if data were normally distributed. Concerning anonymity and confidentiality, respondents were informed that the study was carried out for academic purposes and that

any sensitive information would not be divulged. Figure   4 presents a summary of the research methodology.
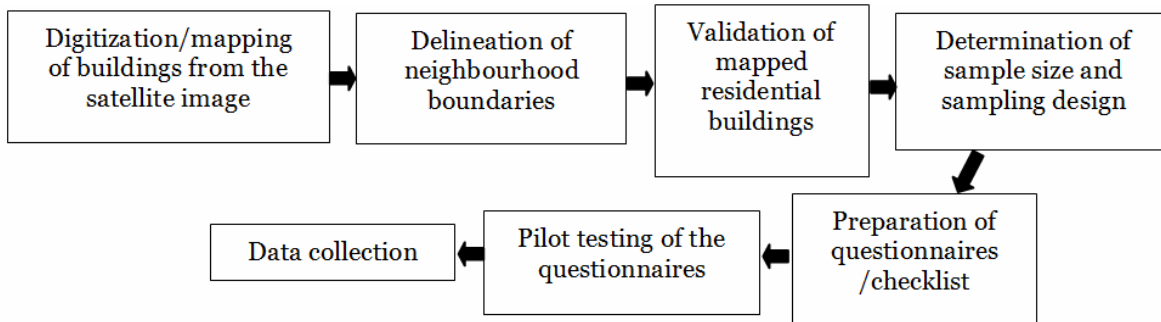

Fig. 4. Summary of the research methods for the current study.

3. RESULTS AND DISCUSSIONS

As mentioned in the introduction section, this study had two objectives. First, to explore the extent to which residential developments in Kenya, namely in Kisii town, comply with the planning standards that regulate building lines. Second, to examine the factors that influence non-compliance with the recommended building lines in Kisii town. The study further tested the hypothesis that there was no statistically significant difference between the recommended planning standards on the building lines and the observed extent of compliance by residential developments in Kisii town. This section, therefore, presents the results and discussion of the research findings. It, however, begins by presenting some background information that covers the outcome of response rate, the test of reliability and statistical assumption of normality, and the distribution of access roads in Kisii town.

3.1. Background information

To determine the extent of compliance with the planning standard that regulates building lines in Kisii town, out of the 364 questionnaires that were administered, 290 were returned, thus a response rate of 80%. This was above the threshold of 55.6% that is recommended by Baruch (1999).

Regarding the reliability test, the resulting Pearson's bivariate correlation coefficient was 0.91, which was rated as a very high positive correlation. Further, the p-value of the Shapiro-Wilk test was greater than 0.05, signifying that the data were normally distributed.

The current study took stock of the distribution of the widths of access roads that were fronted by the sampled residential developments because the size of a building line is determined by the width of the corresponding access road (Table 2).

Table 2. Distribution of the width of access roads in the study area.

Residential neighbourhood	Width of access roads							
	6m	**8m**	**9m**	**10m**	**12m**	**18m**	**22m**	**40m**
Nyanchwa	-	-	75%	-	-	12%	13%	-
Jogoo	-	1%	89%	-	-	3%	7%	1%
Egesa	-	-	86%	-	10%	-	4%	-
Nyamataro	-	-	94%	-	-	-	5%	1%
Daraja Mbili	37%	2%	62%	3%	12%	13%	-	10%
Mwembe	-	3%	93%	-	3%	2%	-	3%
Nyamage	-	-	63%	13%	7%	10%	4%	3%

All the buildings in Nyanchwa fronted access roads of widths of not less than 9 meters. In Jogoo, the widths of access roads ranged from 8 to 40 metres. While in Egesa, the fronted roads were of 9 metres (86%), 12 metres (10%) and 22 (12%) metres (4%), in Nyamataro, most of the roads had widths of 9 metres (94%), 22 metres (5%) and 40 metres (1%). Daraja Mbili was the only neighbourhood where developments fronted roads with widths of less than 8 metres.

In Mwembe, most of the sampled buildings (93%) fronted access roads with a width of 9 metres,

followed by 3% of them that fronted roads with widths of 8, 18 and 2.5 metres.

The 40-metre road refers to the main transportation corridor that links Kisii town and Kilgoris town. Similar to Mwembe, most buildings in Nyamage (63%) fronted a 9-metre road, followed by a 10-metre road (13%), an 18-metre road (2%) and a 40-metre road (3%). It can, therefore, be deduced that most buildings fronted 9-metre wide access roads, showing that they ought to comply with a minimum building line of 6 metres.

3.2. Extent of compliance with the recommended building lines in Kisii town

The first research objective was to explore the extent to which residential developments in Kisii town were complying with the planning standards that regulate building lines. A compliance assessment was therefore undertaken per residential neighbourhood as follows.

3.2.1. Nyanchwa

The preliminary descriptive statistics revealed that the mean for recommended minimum building line planning standard (M =6.50, SD = 1.14) in Nyanchwa neighbourhood was less than the observed building line (M = 3.52, SD = 1.38) and statistically significant, t (23) = 7.12, p = .000. Compliance declined by a mean of 2.98 (Table 3, Fig. 5).

Table 3. Paired samples test for building line standard, Nyanchwa.

	Paired differences				Sig. (2-tailed)
	Mean	SD	t	df	
Recommended building line *versus* observed building line	2.98	2.05	7.12	24	.000

The above research findings disclose that the enforcement of this important planning standard by the CGOK was not effective in Nyanchwa. This consequently undermines the development control principles of access, safety, compatibility and convenience. Compliance with the planning standard was further examined spatially (Fig. 5). Results confirmed the outcome of statistical analysis in Table 3 that most developers in Nyanchwa disregarded the recommended planning standard regulating building lines.

Legend
☐ Buildings
▬ 12 m road building line
▬ 9 m road building line
⌐ Neighbourhood boundary

0   100   200 m

Fig. 5. Spatial compliance with building lines in Nyanchwa.

3.2.2. Jogoo, Egesa, Nyamataro and Daraja Mbili

The GIS spatial analysis demonstrated that most residential buildings that front key roads in the above neighbourhoods are sited beyond the prescribed building lines of 6 metres. A particular observation was made on the 40 metres road (Kisii – Nyamira road) in Jogoo where several non-complying buildings are located (Fig. 7). This problem was not only limited to Jogoo but equally noticeable in Egesa, Nyamataro and Daraja Mbili neighbourhoods as further demonstrated in Figure 6. Apart from the building line, the building flouts other planning standards that include, but not limited to building coverage ratio, floor area ratio, car parking, as well as side, rear and front spaces (Fig. 6).

Although most buildings located along the same road were demolished by the CGOK in 2016 on

the account of being on the road reserve, the building was not affected despite clearly flouting the recommended planning standard that is used in regulating building lines. The study further undertook a descriptive analysis to deepen the understanding of

the extent of compliance with the standard in Jogoo, Nyamataro, Egesa and Daraja Mbili. As usual, compliance with the standard was dependent on road widths.

Fig. 6. A building (see the pointer) flouting the planning standard in Daraja Mbili.

Fig. 7. The extent of compliance with building lines in Jogoo.

Although most buildings located along the same road were demolished by the CGOK in 2016 on the account of being on the road reserve, the building was not affected despite clearly flouting the recommended planning standard that is used in regulating building lines. The study further undertook a descriptive analysis to deepen the understanding of the

extent of compliance with the standard in Jogoo, Nyamataro, Egesa and Daraja Mbili. As usual, compliance with the standard was dependent on road widths. The sampled developments fronted roads whose recommended widths were between 6 and 40 metres. Mean analysis showed that the observed building line in Jogoo (M = 3.51, SD = 1.35) was less than the

recommended planning standard (M = 6.47, SD = 1.09), and so was the case of Nyamataro where the observed mean (M = 3.10, SD = .90) deviated from the recommended standard (M = 6.08, SD = .50). Building lines in Egesa (M = 3.55, SD = 1.43) also did not comply

with the recommended planning standard (M = 6.67, SD = 1.08). Daraja Mbili was not any different since the observed building line (M = 3.26, SD = 1.22) was less than the recommended planning standard (M = 6.45, SD = 1.08) (Table 4).

Table 4. Statistics for compliance in Jogoo, Nyamataro, Egesa and Daraja Mbili.

Neighbourhood	Remarks	M	N	SD	SME
Jogoo	Recommended building line	6.47	70	1.09	0.13
	Observed building line	3.51	70	1.35	0.16
Nyamataro	Recommended building line	6.08	35	0.50	0.08
	Observed building line	3.10	35	0.90	0.15
Egesa	Recommended building line	6.67	31	1.27	0.22
	Observed building line	3.55	31	1.43	0.25
Daraja Mbili	Recommended building line	6.45	60	1.08	0.13
	Observed building line	3.26	60	1.22	0.15

Based on the observed descriptive statistics, a test for the statistical significance of these deviations was further conducted (Table 5). Results showed that Jogoo had a lower mean compliance with building line planning standard (M = 2.95, SD = 1.97) and statistically significant, t (69) = 12.51, p = .000. Nyamataro similarly reported low compliance (M = 2.97, SD = 1.12) and equally statistically significant, t (34) = 15.60, p = .000. At the same time, in Egesa, developers flouted the planning standard (M = 3.11, SD

= 2.26) which was statistically significant, t (30) = 7.66, p = .00. As also observed in other neighbourhoods, Daraja Mbili equally registered low mean compliance (M = 3.18, SD = 1.68) that was statistically significant, t (59) = 14.62, p = .000. Given that the observed mean was less than the prescribed respective building lines, it was evident that all sampled residential developments did not comply, thus posing a further challenge towards sustainable spatial development. This undermines the development control principle of compliance.

Table 5. Paired sample test for compliance in Jogoo, Nyamataro, Egesa and Daraja Mbili.

Residential neighbourhood/remarks		Paired differences			t	df	Sig. (2-tailed)
		M	SD	SEM			
Jogoo	Recommended building line *versus* observed building line	2.95	1.97	0.23	12.51	69	0.00
Nyamataro	Recommended building line *versus* observed building line	2.97	1.12	0.19	15.60	34	0.00
Egesa	Recommended building line *versus* observed building line	3.11	2.26	0.40	7.66	30	0.00
Daraja Mbili	Recommended building line *versus* observed building line	3.18	1.68	0.21	14.62	59	0.00

3.2.3. Mwembe and Nyamage

The compliance with recommended planning standard that regulates building lines in Mwembe and Nyamage were jointly analyzed because they are zoned as high development density by the CGOK. The analysis using one-sample descriptive statistics showed that observed mean compliance (M = 3.10, SD = 0.92) in Mwembe was lower than recommended mean/test value of six (6) metres (the recommended building line). The same was observed in Nyamage where observed mean (M = 2.70, SD = 1.02) was below this test value. Further analysis revealed that in Mwembe,

the modal frequency for non-compliance was three (3) metres while that of Nyamage was two (2) meters, signifying that most developers did not comply with this standard, a situation also illustrated in Figure 8.

The business cum residential development had completely encroached the six (6) meter building line, affecting the carriageway as shown in Fig. 8. It was noted that, despite the glaring non-compliance, the building had been duly approved by the CGOK as evident by the observed construction site board. In this regard, a one-sample t-test was undertaken to explore if these observed mean deviations were statistically significant. Results in Table 6 showed that the declined

mean compliance in Mwembe (-2.88) was statistically significant, t (39) = -19.87, p =.00 also that of Nyamage (-3.30) that was significant, t (29) = -17.68, p =.00,

confirming that the planning standard was highly disregarded by the developers.

Fig. 8. A building (*see the pointer*) flouting the 6 metres building line in Mwembe.

Table 6. One-sample test on compliance with building lines in Mwembe and Nyamage.

Residential neighbourhood	Test Value = 6m			
	t	df	Sig. (2-tailed)	Mean Difference
Mwembe	-19.87	39	0.00	-2.88
Nyamage	-17.68	29	0.00	-3.30

3.3. Test of the research hypothesis

The current study was based on the hypothesis that there is no statistically significant difference between the recommended planning standards on the

building lines and the observed extent of compliance of residential developments in Kisii town. The hypothesis was tested using a paired sample t-test and results are presented in Table 7.

Table 7. Test for the research hypothesis.

	Paired differences							
	M	SD	SEM	95% confidence interval of the difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Recommended building line *versus* observed building line	3.446	2.352	0.13814	3.174	3.718	24.947	289	0.000

Results showed that compliance was low (M = 3.44613, SD = 2.35237) for all sampled developments and statistically significant, t (289) = 24.947, p = .00, thus indicating inadequate development control by the CGOK. In general, compliance declined by a mean difference of 3.446 metres (see Table 7).

These findings concur with that of Aluko (2011) who established that the 16 local governments in

Lagos metropolis (such as Ojo, Agege and Ikeja), Nigeria, ignored the contraventions of planning standards, namely developers disregarding building lines.

These local planning authorities were, therefore, less aggressive and concerned with enforcing the applicable laws at the disadvantage of sustainable urban development, a situation further augmented by

the lack of dedicated and competent staff to undertake development control.

3.4. Factors influencing non-compliance with building lines in Kisii town

The second research objective sought to examine the factors that influence non-compliance with planning standards that regulate building lines in Kisii town. Results are presented and discussed in the subsequent subsections.

3.4.1. Obtaining of development permission

According to section 57 (1) of the PLUPA (the Government of Kenya, 2019), nobody is permitted to carry out development in Kenya without development permission granted by the respective member of the county executive committee. The current study, therefore, sought to find out if developers in Kisii town had obtained development permission before starting construction. It was established that 29.7% did not comply. The magnitude of this problem was therefore interrogated per neighbourhood as presented in Table 8.

Table 8. Obtaining of development permission from the CGOK.

Status of developer	Residential neighbourhood						
	Nyanchwa	Jogoo	Egesa	Nyamataro	Daraja Mbili	Mwembe	Nyamage
Obtained development permission	8.3%	22.1%	9.3%	9.3%	23.0%	17.2%	10.8%
Did not obtain development permission	8.1%	29.1%	14.0%	18.6%	15.1%	5.8%	9.3%

Most of those who lacked development permission were from Jogoo (21%), Nyamataro (18.6%), and Egesa (14%). In such a context, these developers were bound to flout the recommended planning standard on the building lines since they were not in the records of the CGOK, hence occupying unauthorized buildings. Conversely, although obtaining development permission was correspondingly low, most of developers who attempted to act in accordance with the requirements were from Daraja Mbili (23%), Jogoo (22.1%) and Mwembe (17.2%).

3.4.2. Engagement of registered professionals

The current study further investigated if developers had engaged registered professionals (architects) in the design of their buildings. This is because architects as professionals have a duty of guiding their clients when it comes to compliance with applicable building development control regulations with particular reference to building lines. Reference was made to section 3 (1) of the Architects and Quantity Surveyors Act (the Government of Kenya, 2012) that disallows a person who is not registered to practice as an architect. However, as the case in the application for development permission, the current study further found out that 32% of developers never engaged the registered architects during the initial design of their proposed residential building developments. Most of the developers (48.4%) who never contracted any registered professionals were from Jogoo as established in Table 9.

Table 9. Engagement of registered professionals by developers.

Status of developer	Residential neighbourhood						
	Nyanchwa	Jogoo	Egesa	Nyamataro	Daraja Mbili	Mwembe	Nyamage
Engaged registered professional	10.7%	12.7%	11.2%	16.2%	23.9%	14.2%	11.2%
Did not engage registered professional	3.2%	48.4%	9.7%	3.2%	14.0%	12.9%	8.6%

These findings relate to those presented in Table 8 which also demonstrates that most developers who failed to obtain development permission were found in Jogoo.

Based on the findings revealed in Table 9, the current study additionally investigated if there was any association between obtaining development permission and engagement of professional architects by

developers. The results of this inquest are presented in　　Table 10.

Table 10. Obtaining development permission and engagement of registered professionals.

Status of developer	Engaged registered professional	Did not engaged registered professional
Obtained development permission	79.4%	20.6%
Did not obtain development permission	40.7%	59.3%

The cross-tabulated results in Table 10 show that out of developers who obtained development permission, 20.6% did not involve registered architects. This indicates a lapse in the development control process, a situation that appears where non-professional architects, acting as brokers, obtain a job from a client, design the building and then at a negotiated fee approach a registered architect to endorse the proposed building plans. The problem was heightened by the results of the current study revealing that 35% of the developers were unaware of the documented process to be followed in obtaining development permission from the CGOK. Additionally, among those who never obtained development permission, 59.3% did not engage registered architects. This could suggest that engaging a registered architect is a precursor for obtaining development permission, consequently increasing the odds of complying with the recommended planning standard on building lines.

3.4.3. Inspection of buildings during development

To promote compliance with planning standards during construction, section 16 (1) of the Local Government (Adoptive By-Laws) (Building)

Order 1968 (the Government of Kenya, 1968), commonly known as the 'Building Code', requires all buildings to be regularly inspected during construction. Further, section three (3) mandates a person who has constructed a building to give a notice of its completion to facilitate the final inspection audit to be undertaken towards the issuance of the certificate of completion. This underpins why section four (4) prohibits the use of a building before a certificate of completion has been issued by the CGOK. On this account, the current study determined the extent to which residential buildings that were under construction were inspected by the CGOK. Initial research findings showed that 37% of the developers were unaware that buildings should be inspected during the construction process at planned intervals. On account of this gap, 40% of them did not issue a notice to the CGOK to initiate the inspection of their buildings. Relatively, out of the 37% of developers who were unaware of the statutory inspection requirement, a high majority (92%) never issued a notice of inspection, a problem further corroborated by the fact that 44% of them indicated that their buildings were never inspected by the CGOK during different construction phases (as depicted in Table 11), consequently representing a lapse in the building development control process.

Table 11. The extent of residential buildings inspection in Kisii town.

Residential neighbourhood	Buildings under construction		Completed buildings	
	Inspected (%)	Not inspected (%)	Inspected (%)	Not inspected (%)
Nyanchwa	66.7	33.3	50.0	50.0
Jogoo	50.0	50.0	20.0	80.0
Egesa	35.5	64.5	29.0	71.0
Nyamataro	42.9	57.1	28.6	71.4
Daraja Mbili	58.3	41.7	30.0	70.0
Mwembe	70.0	30.0	45.0	55.0
Nyamage	70.0	30.0	30.0	70.0

From Table 11, it is evident that most of the buildings that were not inspected during construction are located in Egesa (64.5%) followed by Nyamataro (57.1%), Jogoo (50%), Daraja Mbili (41.7%), Nyanchwa (33%) and Mwembe and Nyamage, respectively 30%. It may, therefore, be argued that non-inspection of

buildings under construction by the CGOK is a key driver to non-compliance with the planning standard that regulates building lines in Kisii town. The current study further established that although 44.5% of the buildings were not inspected during construction, 3.9% were still irregularly subjected to the final inspection

audit. Similarly, as presented in Table 12, even though 52.8% of the buildings were subjected to inspections during construction, 47.2% still failed to undergo the final quality assurance inspection audits. Both cases depict ineptness in development control by the CGOK, consequently a further driver to non-compliance with the recommended building lines.

Table 12. Construction and post-construction quality assurance audits.

Construction audit	Post-construction audit	
	Buildings inspected after completion	Buildings not inspected after completion
Buildings inspected during construction	52.8%	47.2%
Buildings not inspected during construction	3.9%	96.1%

Another important trait related to the compliance with the building lines in the study area was whether the sampled buildings were inspected by the CGOK upon completion and if a certificate of completion was issued as required by the Building Code. Results indicated that only 33% were inspected. In the end, a majority of the developers were never issued with the certificates of completion, suggesting they illegally occupied their buildings, hence a high chance of disregarding the planning standards that regulate building lines. This resulted in the cross-examination of the association between the final inspection audit of buildings by the CGOK and obtaining the certificate of completion by developers (Table 13).

Table 13. Final inspection audit and obtaining of the certificate of completion.

Quality assurance inspection audit	Status of building certification	
	Obtained the certificate of completion	Did not obtain the certificate of completion
Building inspected after completion	83.3%	16.7%
Building not inspected after completion	5.0%	95.0%

Results depicted in Table 13 indicate that out of the total number of developers whose buildings were inspected after their completion (31%), 83.3% were issued with certificates of completion compared to 16.7% who were not successful. However, of concern was that although 69% of the buildings were not inspected after they were completed, 5% of them still obtained certificates of completion under unclear circumstances, consequently depicting a major lapse in the building development control by the CGOK. From the perspective of developers', by using a five-point Likert scale, the current study additionally determined, the extent to which the GGOK inspected buildings under construction, inspected completed buildings to ensure compliance with planning standards, commitment in the issuance of certificates of completion and ensuring that building designs are undertaken by registered professionals (architects) (see Table 14).

Table 14. Developers' rating of the CGOK's efficiency in building development control.

Aspect of regulation	N	Minimum	Maximum	M	SD
Inspection of buildings under construction	290	1.0	5.0	3.314	1.0693
Inspection of completed buildings	290	1.0	5.0	2.731	1.1021
Issuance of the certificate of completion	290	1.0	5.0	2.548	.9591
Ensure that buildings are designed by registered architects	290	1.0	5.0	3.221	1.0152

Regarding the inspection of buildings under construction, a mean of 3.314 with a high standard deviation of 1.0693 was reported. Concerning the inspection of completed buildings, the resulting mean was of 2.731, with a standard deviation of 1.1021. The issuance of certificates of completion was markedly

rated the lowest (M=2.548, SD=.9591). Lastly, ensuring that building design was undertaken by registered architects reported a mean of 3.221 and a subsequent standard deviation of 1.015. Since the reported means are less than the Likert scale values of five (coded as 'very high'), it can, therefore, be further construed that the CGOK's inadequacy in undertaking building development control is a key barrier to the effective regulation of compliance with the building lines. The above research corroborates to that of Raji and Atta (2017) who found out that most developers in Suleja City, Nigeria, ignored recommended building lines, as well as to the findings of Rukwaro (2009) who established that the residential extensions in Buru Buru Estate, Nairobi, overlooked this important standard. The findings further compare to that of Fashina et al. (2020) who proposed that the government of Somaliland should initiate the process of implementing building codes as a strategy towards a sustainable future. However, unlike Raji and Atta (2017), Rukwaro (2009) and Fashina et al. (2020) who relied on field observations, the current study undertook actual field measurements coupled with spatial analysis, consequently contributing to the growing body of literature in urban building development control.

3.4.4. The delusion of building lines by the CGOK

The current study examined some of the approval conditions that were imposed on developers by the CGOK by reviewing 190 building plans that were approved between 2019 and 2020. The aim was to determine whether the planning standard for building lines was appropriately interpreted for subsequent enforcement during construction (Fig. 9).
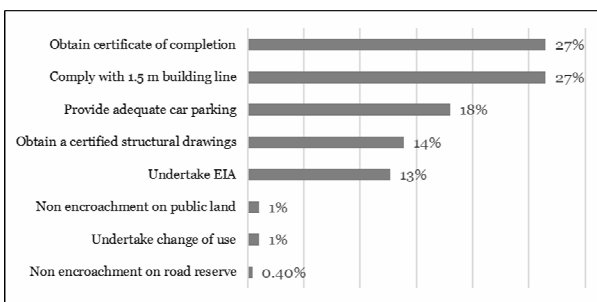

Fig. 9. Analysis of approval conditions granted by the CGOK.

It can be seen that conditions were limited to compliance with building lines and obtaining of a certificate of compliance (each 27%), provision of parking (18%), certification of structural drawings by a registered engineer for multi-family dwelling units and undertaking Environmental Impact Assessment (EIA) (14% and 13%, respectively), change of use (1%), non-encroachment of road reserve (0.4%) and non-encroachment of public land (0.1%). A drawback of

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these conditions with particular reference to the approval on building lines is that the minimum building line, according to the Physical Planning (Building and Development) (Control) Rules, 1998 (the Government of Kenya, 1998), should be of 6 m and not 1.5 m. Such a delusion of the planning standard by the CGOK misleads developers and may additionally suggest why most of them do not comply with the recommended building lines.

4. CONCLUSION

Most residential developments in Kisii town do not comply with the recommended planning standards that regulate building lines. The status quo is triggered by four interrelated issues. First is the developers' failure to obtain development permission from the CGOK. As such, they liberally operate without any quality assurance audit, a pointer revealing that the CGOK lacks an accurate database on the number of ongoing building developments within its spatial jurisdiction. Second, most developers in Kisii town rarely engage registered professionals, resulting in building developments lacking professional input. The third is the irregular inspection of residential buildings under construction by the CGOK to maintain quality assurance, and fourth, the delusion of the applicable standards that regulate building lines by the CGOK during the final approval process. This misinforms developers, therefore, encouraging non-compliance. It also blurs the capacity of CGOK to enforce and monitor compliance. These problems continue despite the legal framework that grants it the power to undertake development control.

From the foregoing, the findings of this study present three implications. First, to academia, it deepens the debate on development control by practically demonstrating how compliance with the planning standards that regulate building lines may be statistically and spatially evaluated, thus addressing a gap in knowledge that has hitherto existed. Thus, it validates the application of the TRC in development control. Second, the findings are of use for the county governments in Kenya who are responsible for development control. This study demonstrated how unauthorized developments may be spatially monitored. It further presented compelling evidence on the magnitude of non-compliance with the planning standard that regulates building lines. Third, the study benefits the national policy formulating institutions, regulatory bodies and professional associations such as the National Physical and Land Use Planning Consultative Forum, the National Land Commission, the Physical Planners Registration Board, the Board for the Registration of Architects and Quantity Surveyors, the Town and County Planning Association of Kenya, and the Architectural Association of Kenya on the legislative, policy and professional practise reforms that

Kenya should prioritize to address the recurring problem of development control in urban areas. It will therefore offer a practical point of reference when reviewing the current Physical Planning Handbook, the 1968 Building Code, or when setting up regulations for implementing the PLUPA. A justification for reviewing the 1968 Building Code has previously been echoed by Kabando and Pu (2014) and Otieno (2012).

To promote compliance with the planning standard that regulate building lines in Kisii town, four recommendations are proposed. First, the CGOK should improve the current monitoring system to ensure that each building under construction has been duly approved and that each developer has the statutory certifications. However, for this to happen, the CGOK should regularly sensitize the public on the procedures and importance of having approved building plans. This may be undertaken in liaison with the Assistant County Commissioners who frequently convene public meetings at the local administrative levels to communicate and monitor the implementation of the government's development agenda. To further aid surveillance, the CGOK should establish a comprehensive Planning Monitoring System (PMS) that integrates GIS and remote sensing to provide a real-time platform for monitoring the spatial extent of developments in the study area, therefore providing an avenue for detecting unauthorized developments along with those that disregard planning standards.

Second, the CGOK should ensure that the design of building plans is exclusively undertaken by registered architects. For this to succeed, it should partner with the Board for the Registration of Architects and Quantity Surveyors to ensure that individuals who are not registered as architects alongside errand architects who endorse building plans at a fee are reprimanded as per the existing code of ethics for professional practice. Third, to promote quality assurance in the construction industry, the CGOK should inspect the construction of each building previously approved to ensure compliance, at planned intervals. Each building should be certified as safe for occupation once construction is completed. The proposed PMS should also present an opportunity for monitoring the certification of buildings. Fourth, while approving building plans, the CGOK should adhere to Rule 12 (2) of the Physical Planning (Building and Development) (Control) Rules, 1998 (the Government of Kenya, 1998) which stipulates the correct planning standard for building lines.

Although this study determined the extent to which the planning standard that regulates building lines is complied with in addition to what drives non-compliance, it was limited to residential land use. This gap presents an opportunity for further research with a prospect investigating if other categories of urban land use such as educational, industrial or commercial are complying with the applicable standards.

REFERENCES

Agbola T. (1985), The concept, evolution and role of development control and planning administration in Nigeria. Paper presented at the national workshop on development control and planning administration in Nigeria, June 24-28. URL: https://www.researchgate.net/publication/326504102_Planning_Regulations_and_Implementation_Mechanisms_in_Postcolonial_Lagos

Akeem O. A., Olutayo O. O., Theophilus A. A. (2018), Planning Regulations and Implementation Mechanisms In Postcolonial Lagos, Journal of Globalization Studies, 9 (2), 91–106. https://www.socionauki.ru/journal/articles/1646256/

Alnsour J., Meaton J. (2009), Factors affecting compliance with residential standards in the city of Old Salt, Jordan. Habitat International, 33 (4) 301-309. https://www.sciencedirect.com/science/article/abs/pii/S0197397508000453

Aluko O. (2011), Development Control in Lagos State: An assessment of public compliance to space standards for urban development. African Research Review, 5 (22), 169-184. https://www.ajol.info/index.php/afrrev/article/view/72306

Arimah B. C, Adeagbo D. B. (2000), Compliance with urban development and planning regulations in Ibadan, Nigeria. Habitat International, 24 279-294. https://www.sciencedirect.com/science/article/abs/pii/S0197397599000430

Arku G., Mensah K. O., Allotey N, K., Frempong E. A. (2016), Non-compliance with building permit regulations in Accra-Tema city-region, Ghana: exploring the reasons from the perspective of multiple stakeholders. Planning Theory & Practice, 1-20. https://www.tandfonline.com/doi/abs/10.1080/14649357.2016.1192216

Atamewan E. E. (2019), factors affecting implementation and compliance with housing standards for sustainable housing delivery in Bayelsa State, Nigeria. European Scientific Journal 15 (3), 1857-7881. https://eujournal.org/index.php/esj/article /view/11709

Baker T. L. (1994), Doing social research (2nd Ed.). New York: McGraw-Hill Inc. https://archive.org/details/doingsocia lresea00bake_0

Baruch Y. (1999), Response Rate in Academic Studies-A Comparative Analysis. Human Relations. 5 (4), 421-438. https:// journals.sagepub.com/do i/10.1177/001872679905200401

Clarke G. (1994), Reappraisal of the Urban Planning Process as an Instrument for Sustainable Urban

Development and Management. Mosha, A. C. (ed.), A Reappraisal of the Urban Planning Process (pp. 13–28). Nairobi: UNCHS. https://www.worldcat.org/title/reappraisal-of-the-urban-planning-process/oclc/35042499.

Escamilla V., Emch M., Dandalo L., Miller W., Martinson F., Hoffman F. (2014), Sampling at community level by using satellite imagery and geographical analysis. Bull World Health Organ, 690–694. https://www.ncbi. nlm.nih.gov/ pmc/articles/PMC4208578/.

Fashina, A. A., Sheikh, A. A., Fakunle, F. F., Opiti, C. (2020), The drawbacks of the lack of building codes and regulations in Somaliland: Public health and safety implications, PM World Journal, 9 (7), 1–24. https://www.researchgate.net/publication/342702974 _The_drawbacks_of_the_lack_of_building_codes_an d_regulations_in_Somaliland_Public_health_and_saf ety_implications

Fiene R. (2016), Theory of regulatory compliance. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3239691

Goodfellow T (2013), Planning and development regulation amid rapid urban growth: explaining divergent trajectories in Africa. Geoforum, 48, 83-93. https://www.sciencedirect.com/science/article/abs/pii /S0016718513000791

Hameed H. A. S. A., Albazaz I. (2019), The Reasons behind non-compliance with building legislation in the residential areas of the City of Baghdad. Journal of University of Babylon for Engineering Sciences, 27 (2) 319-333. https://www. journalofbabylon.com/index.php/JUBES/article/view/2478.

ISO (2020), What are standards in this context? https://www.iso.org/sites/ConsumersStandards/1_sta ndards.html

Kabando K. E., Pu W. (2019), Flaws in the Current Building Code and Code Making Process in Kenya. Civil and Environmental Research, 6 (5) 24-31. https://core.ac.uk/download/pdf/234677771.pdf

Kamarulzaman P. N., Azmi N. F., Sulaiman R. (2019), A Review of Constraint Factors in Complying with Building Control Regulation Related to House Renovation. Journal of Surveying, Construction and Property, 10 (1) 57-62. https://webcache.google usercontent.com/search?q=cache:VUM9nVy3JZ8J:htt ps://ejournal.um.edu.my/index.php/JSCP/article/view /18609+&cd=1&hl=en&ct=clnk&gl=ke

Keivani R. (2010), A review of the main challenges to urban sustainability. International Journal of Urban Sustainable Development, 1 (2), 5–16. https://www. tandfonline.com/doi/full/10.1080/19463131003704213

Krejcie R. V., Morgan D. W. (1970), Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610. https:// home.kku.ac.th/sompong/guest speaker/ Krejcieand Morgan _article.pdf.

Kumar A., Pushplata B. (2017), Problems and prospects of building regulations in Shimla, India – A step towards achieving sustainable development. International Journal of Sustainable Built Environment 6, 207–215. https://www.sciencedirect. com/science/article/pii/S2212609016300619

Kumudini Y., Wickramaarachchi N. C. (2018), An Investigation of non-compliance with Building Regulations in Heritage Areas; A Case Study in Galle Fort-Sri Lanka. http://journals.sjp.ac.lk/index.php/SLJRE/article/view/4357

Leedy P. D. (2005), Practical research. Planning and design. 8th Ed. Pearson Education, Upper Saddle River, New Jersey

Makato E. W. (2013), Analysis of Development Control Regulations Compliance in Kitengela Town, Kajiado County in Kenya M.A Planning Thesis University of Nairobi. http://erepository.uonbi.ac.ke/handle/11295/101229

Maphill (2020), Gray Location Map of Kisii Municipality, highlighted grandparent region, within the entire country. http://www.maphill.com/kenya/nyanza/kisii/kisii-municipality/location-maps/gray-map/highlighted-grandparent-region/entire-country/

Muggah R., Hill K. (2008), African cities will double in population by 2050. Here are 4 ways to make sure they thrive. https://www.weforum.org/agenda/2018/06/Africa-urbanization-cities-double-population-2050-4%20ways-thrive/

Natarajan L. (2017), Socio-spatial learning: A case study of community knowledge in participatory spatial planning. Progress in Planning, 111, 1–23. http://kns.cnki.net/ kcms /detail/detail.aspx?filename =SJES15122600196329&dbcode=SJES

Ngetich J. K., Opata G. P., Mulongo L. S. (2016), Making urban planning and development control instruments work for Kenyan cities: The case of the city of Eldoret. Journal of Emerging Trends in Economics and Management Sciences 7(4):246-254. http://jetems. scholarlinkresearch.com/articles/Making%20Urban% 20Planning %20and%20Development%20newest.pdf.

Obongha U. E, Ojikpong Samuel, B. E., Upuji J. K. (2016), Assessment of building regulations enforcement and housing development in Calabar South-Nigeria. International Journal of Modern Sciences and Engineering Technology, 3 (7), 7-14. https://nebula.wsimg.com/8c8dff7447ab1dd063a07c51 854abd38?AccessKeyId=D81D660734BCB585516F&di sposition=0&alloworigin=1

Olujimi J. A. B (1992), The administration of physical planning in Nigeria: The Ondo state experience. *Landscape and urban planning* 25, 115-136. https://www.sciencedirect.com/science/article/pii/016 920469390127Y

Olujimi J. A. B. (2008), Development Control - Unpublished Course Paper on GSP 211. Dept. Of Geography and Planning, Adekunle Ajasin University, Akungba-Akoko

Omollo W. O. (2019), Barriers to the Effective Regulation of the Building Construction Industry: An Empirical Analysis. Journal of Construction Business and Management, 3(2), 49-58. https://doi.org/ 10.15641/jcbm.3.2.745

Omollo W. O. (2020a), Provision of car parking space in the residential neighbourhoods: A development control challenge in urban areas. International Journal of Human Capital in Urban Management, 5(1):59-68. http://www.ijhcum.net/article_38444.html

Omollo W. O. (2020b), Compliance with planning standards related to the setbacks around domestic buildings: Empirical evidence from Kenya. Journal of Contemporary Urban Affairs, 4(2), 95-108. https://doi.org/10.25034/ijcua.2020.v4n2-9

Omollo W. O., Hayombe P. O., Owino F. O. (2018), Compliance with physical planning standards by residential developments in Kisii Town, Kenya. Architecture Research, 8 (2), 62-73. http://article. sapub.org/10.5923.j.arch.20180802.03.html

Onokerhoraye A. G., Omuta G. E. D. (1986), Urban systems and planning for Africa. Benin City, Nigeria: Editorial Committee, Geography and Planning Series, University of Benin. https://www.worldcat.org /title/urban-systems-and-planning-for-africa/oclc/153 01346?page=citation

Otieno J. (2012), Current building code fit for archives**.** Standard Newspaper. https://www.standard media.co.ke/lifestyle/article/2000056052/current-building-code-fit-for-archives

Raji A. U., Attah U. A. (2017), Enforcing building setbacks as a viable strategy for an emerging city. Path of Science, 3(6), 21-27. https://www.ceeol.com/search/ article-detail?id=544064

Rukwaro R. W. (2009), Owner occupier and violation of building by-laws. Habitat International, 33, 485-498. https://doi.org/10.1016/j.habitatint.2009.03.004

Sylvester I. T. (2014), The dialectics between physical plans and physical development in contemporary urban Nigeria: empirical evidence from the Kighir-Adeke Layout, Makurdi, Nigeria. Academic Research International 5(4), 142-152. http://www.savap.org. pk/journals/ARInt./Vol.5(4)/2014(5.4-16).pdf**.**

The Government of Kenya (1968), The Local Government (Adoptive By-Laws) (Building) Order 1968

and The Local Government (Adoptive By-Laws) (Grade II Building) Order 1968. https://eregulations.invest. go.ke/media/BUILDING%20CODE.pdf

The Government of Kenya (1998), Architects and Quantity Surveyors Act Government Printer: Nairobi. http://kenyalaw.org: 8181/exist/kenyalex/actview.xql? actid=CAP.%20525**.**

The Government of Kenya (1998), Physical Planning (Building and Development) (Control) Rules. Government Printer: Nairobi. http://faolex.fao.org /docs/ pdf/ ken14866b.pdf

The Government of Kenya (2012), Architects and Quantity Surveyors Act. Government Printer: Nairobi. https://eregulations.invest.go.ke/media/Architectsand QuantitySurveyorsAct.pdf

The Government of Kenya (2013), Science, Technology and Innovation Act: Government Printer: Nairobi. https: //www.nacosti .go.ke/images/docs /2018/november/Science-Technology-and-Innovation-Act-No.-28-of-2013.pdf.

The Government of Kenya (2019), Physical Planning and Land Use Planning Act. Government Printer: Nairobi. http://kenyalaw.org/kl/ fileadmin/ pdfdownloads/Acts/2019/PhysicalandLandUsePlannin gAct_No13of2019.pdf

The Kenya National Bureau of Statistics (2019), Kenya population and housing census, volume I: Population by county and sub-county. https://www. knbs. or.ke/ ?page_id=3142

Warner C. (2015), Participatory mapping: A literature review of community-based research and participatory planning**.** https://pdfs.semanticscholar.org/883f/768 308cac12556b9 12750590e9720c42b146.pdf

Windapo A., Cattell K. (2010), A Study of Building Contractors' Compliance with National Building Regulations in Cape Town. https://mafiadoc.com/a-study-of-building-contractors-compliance-with-national-building-_599c1fcd1 723dd09401ad6fe.html

Yau Y., Ho D. C. W., Chau K. W. (2010), On the empirics of housing illegality: A case study in Hong Kong. In: Built Environment: Design, Management and Applications. Editor: Paul S. Gelle, Nova Science Publishers, Inc. https://www.researchgate.net /publication/259823813_On_the_empirics_of_housin g_illegality_ A_case_study _in_Hong_Kong