

# Efficacy of Development Control as a Tool for Monitoring Building Developments in Kenya

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## ABSTRACT

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This study examined the efficacy of development control in the monitoring of building developments in Kenya, a case study of Kisii Town. It focused on the extent to which the 1968 Building Code was enforced by the County Government of Kisii in an attempt to promote quality assurance. The target population comprised 7,430 residential developments from where a sample size of 364 was proportionately and randomly drawn. Research findings indicated that 39% of developers were unaware that their developments should have been inspected during construction. Similarly, awareness of building inspection significantly predicted if developers issued Notices of Inspection to the planning authority to facilitate inspections. Consequently, developers who were unaware that their building constructions required inspection were 99.9% less likely to issue such notices. Moreover, developers who did not obtain development permission were correspondingly 99.9% less likely to issue Inspection Notices. As a result, those who did not issue Notices of Inspection were 99.8% less likely to have their buildings inspected during construction due to lack of records indicating when such constructions had commenced. The study concludes that although the County Government of Kisii is lawfully mandated to monitor building developments in Kisii Town, the function is not well executed. This gap affords developers with an opportunity of not conforming to the approved building plans.

**Keywords:** Development control, Building code, Kisii Town, Kenya.

## INTRODUCTION

The world has been witnessing an increased gathering of its population in urban regions since 1990, a trend that did not commence recently, but has been continuous as characterized by increased numbers of urban residents from a yearly average of 57 million between 1990 and 2000, to a further 77 million recorded between 2010 and 2015 [1]. While it was also estimated that in 2016, 54 % of the world's population resided in urban areas, it is projected that these urban areas will accommodate 60% of the global population by 2030, potentially attracting development control challenges [2]. Agenda 21 emanating from the United Nations Conference on Environment and Development (UNCED) in 1992 was the first international document highlighting the importance of land use planning [3]. It recommends for effective planning by requiring countries to initiate development control measures that would promote sustainable land use.

To further address the problems occasioned by urbanization, a policy, "International Guidelines on Urban and



Territorial Planning”, was developed by UN-Habitat [4]. Territorial planning was construed to mean a decision making process aimed at realizing economic, social, cultural and environmental goals through the development of spatial visions, strategies and development plans, in addition to the application of policy principles, tools, institutional participatory mechanisms, and regulatory procedures. A proposal was, therefore, made that these guidelines should form the basis for planning [4]. During the same period, the United Nations [5] introduced 17 Sustainable Development Goals (SDGs) to coordinate global development efforts over the next 15 years. Goal 11 on sustainable cities and communities targets to enhance sustainable human settlement planning in all countries by 2030. This without hesitation provides a justification for enforcing building development control. From the foregoing review, it is clear that development control has emerged as a contemporary challenge attributable to the effects of rapid urbanization, especially in developing countries. In an attempt to address the problem, countries have taken up the challenge through the provision of appropriate legal and institutional frameworks to promote the maintenance of a well-planned and sustainable environment [6]. Development control has nonetheless come under sharp criticism regarding the nature of resolutions made and the manner in which they are executed [7]. On account of this, it is not often acknowledged by developers owing to the restrictions it enforces on them to ascertain compliance with approved development plans [8]. However, to gain a deeper understanding of its significance, the subsequent subsection discusses its salient objectives.

## **OBJECTIVE OF BUILDING DEVELOPMENT CONTROL**

Chapin [9] observes that planning authorities through development control have the obligation of ensuring that property developers develop at the correct place and at the right time, buildings are structurally certified and will not injure occupants, that they are supplied with the essential services and equipment necessary to support the purpose for which they are established, and confirm that the natural resources and environment are sustainably managed to support the present and future generations. These conditions ensure that requirements of recommended building regulations are adhered to, desired density of an area is achieved, proper implementation of zoning regulations, prevention of development in hazardous areas, and controlling exposure to noise and pollution.

Dissanayake [8] improves Chapin’s line of argument by suggesting that development control enables state intervention in guiding land use development, with the intention of implementing strategic planning policies, thereby presenting members of the public with an opportunity of interacting with planning authorities as stakeholders in the built environment. He further opined that because planning laws, approved development plans and their related policies are effected through development control, failure to realize the set objectives of physical planning could be attributed to the adoption of unsuitable policies and application of poorly developed planning standards and associated regulations. In this context, Fischel [10] upholds that land use necessitates regulation to ensure spatial compatibility through the provision of a sustainable built environment. Through this way, planning mandate authorities to arbitrate on potential land use conflicts and further harmonize and regulate activities which could result in undesirable externalities, unsustainable land use, unfairness and biased allocation of resources.

Fischer's views are sustained by Ogundiran and Oyediran [11] who avers that development control is provided for in legislation to regulate the development of land and buildings, thus, a specialized activity undertaken by planners to warrant compliance with development plans.

In Kenya, the Physical Planning Handbook of 2007 describes development control as the process of ensuring that development applications comply with policy guidelines, physical planning standards, approved physical development plans, local authority bylaws, and other relevant statutes [12]. The Handbook outlines the objectives of development control to include as follows: ensuring that implementation of physical development projects conform with approved physical development plan; recommending enforcement actions in case of contraventions against the approved physical development plan proposals or planning standards; evaluating development applications that may have injurious implications to man, the physical and biological environment and socio-economic activities; securing optimal use of land and ensuring that planning decisions are rational; and ensuring that planning regulations are reviewed from time to time in order to manage emerging concerns and resolve conflicts.

## BACKGROUND TO BUILDING DEVELOPMENT CONTROL IN KENYA

Kenya's initiative towards building development control may be traced to the colonial period when the British administration introduced ordinances such as the Crown Land Ordinance (1902) and Crown Land Ordinance (1915) to regulate land use within the former East Africa Protectorate. While the Crown Land Ordinance (1902) subjected all land to the Governor's authority, the Crown Land Ordinance (1915) extended the leases in favor of settlers from the original 99 to 999 years [13]. Legislation for controlling development in towns was further provided for under the 1931 Planning Ordinance, which extended planning powers of the Governor to regulating all land in towns [14]. The Development and Use of Land (Planning) Regulations (1961) were subsidiary legislation of the Land Planning Act (Cap 303), whose purpose was to make provision for land use planning and development. It required that planning applications pay attention to health, amenities, and convenience of the community in addition to ensuring proper density in land use development [15]. In 1968, the Minister for Local Government introduced the Local Government (Adoptive bylaws) (Building) Order (Building Code), which provided that developments must be approved prior to the commencement of construction, in addition to requiring that all buildings under construction must be supervised and issued with Certificates of Occupation upon completion. The Code among other requirements specifies physical planning standards that developers must comply with during construction [16]. The year 1996 saw the enactment of the Physical Planning Act (Cap 286) which repealed the Land Planning Act (Cap 303). The Act provided a framework for the preparation and implementation of physical development plans along with undertaking building development control [17].

Kenya successfully promulgated a new constitution in 2010. Section 66 (1) of the constitution grants the state authority to undertake development control through land use regulation. The fourth schedule further gives county governments the responsibility of county planning and development [18]. A product of this is the County Government Act (2012) under which section 104 (2) obliges a county planning framework to integrate economic,

physical, social, environmental and spatial planning. Section 107 (1) (c) of the Act further empowers the county governments to prepare spatial plans on desired land use patterns. To achieve this, section 111 (1) recommends the preparation of city or municipal land use plans, city or municipal building and zoning plans, and city or urban area building and zoning plan to act as instruments for development control [19].

Apart from the County Government Act (2012), section 36 (1) (g) of the Urban Areas and Cities Act (2012) bestows upon county governments the responsibility of preparing Integrated Development Plans to provide the basis for development control [20]. A further attempt to streamline physical planning in Kenya emerged when the Ministry of Lands sponsored to the National Assembly, the Physical Planning Bill (2017), to comply with the provisions of Articles 60, 66 (i), 67 (2) (h), 68 (b) and the fourth schedule of the Constitution of Kenya (2010). The Bill seeks to revise the Physical Planning Act (Cap 286) with the aim of bringing it into harmony with the Constitution. Section 56 of the Bill exclusively grants county governments the powers to control or prohibit the use or development of land or buildings in order to promote proper and orderly development [21].

## STUDY OBJECTIVE AND THEORETICAL UNDERPINNING

The objective of this study was to determine the efficacy of development control as a tool for monitoring the residential building development process in Kenya. In terms of scope, the study was based in Kisii Town, as a case study. It critically discusses how the Local Government (Adoptive bylaws) (Building) Order (commonly known as the Building Code of 1968) was enforced, as a result promoting quality assurance within the building construction industry. Legally, the Building Code explicitly requires all developments under construction to be monitored to ensure conformity with approved building plans and compliance with recommended planning standards [16]. In this case, the County Government of Kisii as the statutory planning authority has a mandate of ensuring that all building developments within its spatial jurisdiction are procedurally monitored using a predetermined criterion.

This study was anchored in the Public Interest Theory of Regulation (PITR). The theory [22] assumes that the economic markets are very fragile and have a tendency to operate inefficiently and in favor of an individual's concern while ignoring the importance of society. For this reason, to direct and monitor economic markets, government intervenes through regulations. As the regulatory body, the government serves the interest of the society rather than making laws in favor of itself as the regulator. Land being one of the factors of production is, therefore, an integral component of the economic market. Applied to the present study, PITR supports why the building development process in Kisii Town necessitates regulation to ensure compliance with recommended planning standards. In this setup, the County Government of Kisii as a planning authority undertakes enforcement by assigning and restricting the rights to development and improvements. As such, development control intervenes in the processes of building development and occupancy. This is because development control as a tool for plan implementation is undertaken through compulsory directives (laws, rules, regulations, and policies) exclusively issued and enforced by planning authorities. Failure by developers to comply therefore attracts stiff penalties which are clearly stipulated in applicable legislation.

## MATERIALS AND METHODS

### Background of Kisii Town

Kisii Town is located 120 km South of Kisumu City and approximately 400 km West of Nairobi City (Figure 1). It covers an area of 34 km<sup>2</sup> out of which 15 km<sup>2</sup> falls within the central business district, which is leasehold, while the rest comprises periurban settlements in freehold areas. The town's topography is characterized by a series of valleys and further located on a confluence of numerous valleys surrounded by both gentle and steep hills. In the South West lies Nyanchwa Hills at an altitude of 1800 meters above the sea level and to the North East is the Mwamosioma Hills rising to about 1800 meters above the sea level. To the South is also the mountainous Bobaracho and Gesarara rising up to 1950 meters above the sea level. It is also drained by several streams which are tributaries of River Riana [23].



**FIGURE 1.** LOCATION OF KISII TOWN IN KENYA

Source: CountryWatch [24]

The population of Kisii Town was estimated at 90,100 in 2017 and further projected to 140,118 by 2032 [25], an increase that is likely to intensify land use development. If this occurs in the absence of effective development control, challenges such as noncompliance with regulations specified in approved development plans are bound to escalate in the near future at the expense of sustainable urban development.

### Target Population, Sample Size, and Sample Design

Items of inquiry, thus target population comprised 7,430 residential building developments from the seven

sub-location neighborhoods of Kisii Town. These were targeted to determine the extent to which they were monitored by the County Government of Kisii during the construction process. As suggested by Saunders, Lewis, and Thornhill [26], the choice of sample size was determined by the confidence level, the margin of error and the total size of the population from which the sample was drawn. Selection of sample size was therefore guided by the Sample Size Determination Table recommended by Krejcie and Morgan [27]. The resulting sample size was 364 since according to Krejcie and Morgan if the population (N) is between 7,000 and 7,999, the desired sample size (n) should be 364.

The study used a proportional stratified random sampling technique to select 364 residential developments. In this type of sampling, Kothari [28] recommends that the population should be divided into several sub-populations that are individually more homogeneous than the total and then items selected from each stratum to constitute a sample. Four sub-locations (Table I) formed the strata out of which proportional random samples were drawn from their residential neighborhoods to attain the minimum sample size of 364. These neighborhoods included Jogoo, Egesa, Nyamaturo and Daraja Mbili (Mwamosioma sub-location), Nyanchwa (Nyanchwa sub-location), Mwembe (Nyaura sub-location) and Nyamage (Bobaracho sub-location). Because there were no records kept by the County Government of Kisii on the number of residential buildings in Kisii Town, their numbers were first identified using a high spatial resolution satellite image (QuickBird-2, 0.34 metre spatial resolution) obtained from the Regional Centre for Mapping of Resources for Development (RCMRD), Nairobi City County, and thereafter digitized to establish a sampling frame in the form of a feature attribute table. The process entailed delineation of sub-location boundaries of Kisii Town, followed by digitization of all building developments and subsequently spatial segregation of neighborhoods boundaries from respective sub-locations. This was attained through participatory mapping exercises incorporating Assistant Chiefs drawn from respective sub-locations, thus giving credence that there were no overlaps in data collection. As justified by Natarajan [29], such mapping has the advantage of collecting and agglomerating local knowledge of different people to make a high-resolution composite map that provides a greater degree of cognition that can be achieved from traditional mapping methods. Ground truthing exercise to ascertain that delineated boundaries were accurate in addition to confirming that digitized developments were residential was additionally undertaken. As a whole, 7,430 residential developments were mapped from the

**TABLE I. SAMPLING PROPORTION PER STRATUM FOR DEVELOPERS**

Sub-location/Stratum	Neighborhoods	No. of Residential Buildings	Proportional Sample size
Mwamosioma	Jogoo	1,551	76
	Nyamaturo	808	40
	Egesa	821	40
	Daraja Mbili	1,301	64
Nyaura	Mwembe	1,105	54
Bobaracho	Nyamage	1,171	57
Nyanchwa	Nyanchwa	673	33
	Total	7,430	364

neighborhoods of the four sub-locations. This formed the target population as well as provided the sampling frame which was used for data collection (Table I).

To obtain a proportional representative sample size for residential developments per respective stratum (sub-location neighborhoods), the number of buildings from each stratum was divided by the total number of buildings for all strata (7,430) and the product multiplied by the desired sample size of 364 (Table 1). Mwamosioma sub-location (strata) being the largest, its four neighborhoods (substratum) were further demarcated for sampling. These included Jogoo (1,551 buildings), Nyamataro (808 buildings), Egesa (821 buildings), and Daraja Mbili (1,301), resulting in a total of 4,481 buildings. Given that the desired sample size for the sub-location (Mwamosioma) was 220, to get the corresponding sample size for each neighborhood, their respective number of buildings were further divided by the total number of buildings in the sub-location (4,481) and the product multiplied by 220, resulting in sample sizes of 76, 40, 40 and 64 respectively for Jogoo, Nyamataro, Egesa and Daraja Mbili. With reference to other sub-locations, in Nyaura, Mwembe was the only dominant neighborhood. The same occurred in Bobaracho and Nyanchwa sub-locations where Nyamage and Nyanchwa were respectively the only dominant neighborhoods. Samples from each stratum and substratum were afterward drawn using Random Number Table as provided by Saunders et al. [26]. During data collection, when sampled residential developments were occupied by tenants, details of the landlords were sought from them, and the landlords later contacted for data collection.

## DATA COLLECTION INSTRUMENTS

The primary data was collected using questionnaires having both structured and unstructured questions. A justification for using structured questions according to Mugenda and Mugenda [30] is that they are easier to analyze since they are in a readily usable form and easier to administer because items are followed by alternative answers where applicable. Conversely, unstructured questions have the advantage of permitting a greater depth of reaction.

## VALIDITY, RELIABILITY, PILOT TESTING AND DATA ANALYSIS

The current study used content validity, which Kothari [28] defines as the extent to which a measuring instrument provides adequate coverage of the subject under investigation. If the instrument has a representative sample of the universe, the content validity is good. However, for it to be effective, Yaghmaie [31] suggests that two expert judgments are necessary. In order to conform to this important requisite, the questionnaire was given to two experts in urban planning where one assessed what concepts the instrument was trying to measure, while the other determined whether the items adequately represented the concept under study. The questionnaire was finally improved by reviewing on the basis of the two experts' recommendations as well as the pilot test that was undertaken. In this case, Baker [32] recommends that a minimum of 10% of the main sample size is an acceptable number for undertaking any pilot study.

Applied to the current study, this included 36 questionnaires targeting residential developers. The test was conducted in Nyamira Town that is located 25 km from Kisii Town. While cross-tabulation was used to analyze the descriptive relationships between categorical variables, Pearson's Bivariate Correlation was, on the other hand, applied to test the statistical significance of relationships, also between variables. Further, Logistic Regression was used to determine the relationships between binary variables in addition to predicting the dependent variables that were binary from the independent variables that were also binary.

## FINDINGS AND DISCUSSIONS

Building regulations set minimum requirements for safe, healthy, energy-efficient, and accessible buildings. To guarantee that these requirements are met, a building control system is imperative [33]. The extent to which the County Government of Kisii monitors buildings under construction in addition to certifying that those completed are appropriate for the occupation was therefore identified as an important indicator of sustainable land use planning. In this context, buildings developed without regular and planned monitoring are likely to not only disregard recommended physical planning standards (if development permission was granted) and approval conditions but also contribute to uncontrolled land use change. With an objective of promoting quality assurance within the construction industry in Kisii Town, section 16 of the Building Code [16] requires any person who intends to develop a building to issue the County Government in writing a "Notice of Inspection Card" obtained from the relevant office. The intention is to provide a basis for undertaking inspection during constructions. This section, therefore, determines efficacy in the monitoring of residential building developments in Kisii Town through the application of development control.

### Response Rate and Results of Pilot Study

In order to investigate the efficacy of monitoring building development control in the study area, questionnaires were administered to owners of residential developments. Mugenda and Mugenda [30] recommends that whereas a response rate of 50% is considered adequate for data analysis and reporting, 60% is good and 70% and above excellent. In the current study, the response rate was 80%, hence adequately representative for getting to a conclusion in addition to making recommendations towards effective monitoring of building development in Kisii Town. The feedback of 80% was attained as a result of the observed code of ethics on informed consent where the researcher explained to all respondents what the research intended to achieve and that it was for academic purpose only. The researcher further guaranteed all respondents that their confidentiality and anonymity would be strictly maintained since there was no way of knowing their identity from the information given. This is because the questionnaires had no names.

According to Kothari [28] results of a pilot study should always be reported in research. In line with this recommendation, after piloting, the reliability of the questionnaire was tested using Cronbach's  $\alpha$  which,



according to Litwin [34] measures the internal consistency of a group of items by computing their homogeneity. It, therefore, denotes how different items effectively complement each other in measuring different aspects of similar variable or quality. Cronbach  $\alpha$  for the questionnaire administered to developers was 0.834 with a corresponding inter-item covariance of 0.58, denoting very high levels of internal consistency.

### Issuance of Inspection Notice by Developers to the Planning Authority

Section 16 (1) of the Building Code [16] requires a person who intends to develop a building to give the planning authority in writing on a “Notice of Inspection” card indicating the date and time when building development in addition to plumbing and drain laying will commence. Additionally, the foundation bed, foundation concrete, damp proof course, filling, concrete after shuttering is removed, drainage, plumbing installations, and sewer connection should similarly be completed for the quality assurance inspection audit. In the course of an inspection, audit, it is also the responsibility of the planning authority to ascertain that the work is carried out or supervised by a person competent in respect of work involved. Further, the planning authority may anytime during the construction process undertake any reasonable test on the structure to confirm that the building has been constructed as approved.

From the above insight, the study sought to find out if developers had issued the required Notices of Inspection to the County Government prior to commencing construction. A majority (60%) reported having served the County Government compared to 40% who did not. Developers were further requested to indicate if they were aware that building developments must be inspected during the construction process. Most of them (61%) were affirmative compared to 39% who were not. These findings suggest that developers who did not issue the Notices occupied buildings not inspected by the planning authority and may further bring out why most developments in Kisii Town seldom comply with recommended physical planning standards (Figure II).



**FIGURE II.** A BUILDING FLOUTING PHYSICAL PLANNING STANDARDS IN DARAJA MBILI

Source: Field survey, 2018

As demonstrated in Figure II, the development disregards planning standards such as the building coverage ratio, floor area ratio, provision for adequate on plot parking, side, rear and front spaces. These nonconformities could have been averted through adequate monitoring and surveillance by the planning authority. The County Government’s regulations on approval of development permission require developers to engage stakeholders by mounting of construction site notices communicating the nature of proposed developments. The intention is to promote accountability on the side of the developer. This ordinarily assures stakeholders that the project is duly approved. In view of this, descriptive analysis was undertaken to assess and rate the following key aspects from developers, also acting as stakeholders within their respective neighborhoods:

- i) The extent to which other developers in their neighborhoods were aware of building inspection requirement during constructions.
- ii) The extent to which developments in their neighborhoods were inspected during constructions.
- iii) The extent to which the County Government of Kisii was committed to the inspection of building developments in Kisii Town.

A five point Likert Scale (1 = very low, 2 = low, 3 = moderate, 4 = high, 5 = very high) was used to derive appropriate descriptive statistics which rated responses obtained from sampled developers (Table II).

**TABLE II. DESCRIPTIVE STATISTICS ON THE INSPECTION OF BUILDING DEVELOPMENT**

Attributes of Quality Assurance	N	Min	Max	M	SD
The extent of developers’ awareness of building inspection requirement	290	1.00	5.00	3.000	.7566
The extent of inspection by the County Government of Kisii	290	1.00	5.00	3.183	.8864
The extent of the County Government’s commitment to building inspections	290	1.00	5.00	3.339	1.0653

Source: Field survey data, 2018

Information presented in Table II shows that the means for both responses (awareness, extent of inspection and commitment) were on average rated “moderate” on the Likert scale (M = 3.000, SD = .7566; M = 3.183, SD = .8864; M = 3.339, SD = 1.0653). This generally confirms that promotion of developers’ awareness on the significance of inspection, the extent of inspection by the County Government in addition to its commitment to inspection during construction was not very effective, thus contributing to a notable challenge in the promotion of quality assurance within the construction industry in Kisii Town.

**Awareness of Inspection Requirement and Issuance of Inspection Notice**

Having observed that some developers hardly issued notices to facilitate quality assurance inspection during construction, the study explored the envisaged relationship between developers’ awareness of building inspection requirement and whether they issued Inspection Notices to the planning authority to warrant inspection before the

commencement of construction. Preliminary results indicated that out of those developers who were aware of the statutory requirement, 94.3% issued the Inspection Notices compared to 5.7% who failed to do so. Conversely, among those who were unaware, 96% did not issue such notices.

These findings impelled the study to further investigate the implications that may arise if developers were unaware of the statutory requirement. Logistic Regression was used as a tool for statistical analysis. Awareness of the residential development inspection requirement was coded “yes” and lack of such awareness coded “no” (independent variable). The dependent variable was the issuance of an Inspection Notice before commencing construction (where issuance of notice = “yes”, and non-issuance of notice = “no”). Computed Nagelkerke  $R^2$  showed that variation in the dependent variable explained by the independent variable was 82.8% (Table III).

**TABLE III.** THE RELATIONSHIP BETWEEN AWARENESS OF INSPECTION REQUIREMENT DURING CONSTRUCTION AND ISSUANCE OF INSPECTION NOTICES TO THE PLANNING AUTHORITY

Dichotomous Question	B	S.E.	Wald	df	Sig.	Exp ( $\beta$ )
Are you aware of building inspection requirement?	-5.96	.61	94.11	1	.00	.003
Constant	3.17	.51	38.53	1	.00	23.75

Source: Field survey data, 2018

Research findings demonstrate that awareness of building inspection requirement was a significant predictor of issuing an Inspection Notice before commencing of development as the derived p-value of Wald’s statistics was less than 0.05 (Table III). If Ex ( $\beta$ ) was interpreted in terms of percentage, the results suggested that developers who were unaware that their proposed developments must be inspected during the construction process to ascertain conformity were 99.9% less likely to issue such Notices of Inspection to the planning authority than those who were aware of the inspection requirement.

### Issuing of Inspection Notice and Obtaining Development Permission

The study further sought to obtain additional information to determine whether developers who failed to issue Notices of Inspection could have obtained development permission. This line of inquiry was informed by section 4 of the Building Code that requires a person who develops a building to submit a written application to the planning authority for approval [16]. This procedural requirement is also supported by section 30 (1) of the Physical Planning Act (Cap 286) that further highlights that no person shall carry out development within the jurisdiction of a planning authority without a development permission granted by the authority [17]. The obtained descriptive results were first explored through cross-tabulation.

Research findings indicated that out of developers who obtained development permission, 78.4% issued Notices of Inspection prior to commencing of construction compared to 21.6% who failed to do so. In contrast, 90% of developers who had not obtained development permission did not issue such notices before commencing construction. However, of concern was that 10% of developers who did not obtain permission issued Inspection

Notices. This suggests that the planning authority may have inspected buildings that it had not approved. The observed relationship was tested using Logistic Regression (Table IV) where Nagelkerke  $R^2$  established that 45.7% of the variation in the dependent variable (obtaining of development permission) was accounted for by the independent variable (issuing of an Inspection Notice before commencing construction).

**TABLE IV.** THE RELATIONSHIP BETWEEN OBTAINING DEVELOPMENT PERMISSION AND ISSUANCE OF INSPECTION NOTICES TO THE PLANNING AUTHORITY

Dichotomous Question	B	S.E.	Wald	df	Sig.	Exp (B)
Did you obtain development permission?	-3.48	.437	63.71	1	.00	.031
Constant	2.19	.398	30.41	1	.00	9.00

Source: Field survey data, 2018

The test results showed that obtaining development permission significantly predicted the issuance of Inspection Notices,  $p = 0.00$ . With  $\text{Ex}(\beta) = 0.31$ , this implied that developers who did not obtain development permission were 99.9% less likely to issue Inspection Notices than developers who had obtained development permission. This discloses that developers who were unaware of the requirement for issuing Notices of Inspection to hasten quality assurance inspections during the construction process represented those who in the first place did not obtain development permission from the planning authority. Conversely, those who were aware of the requirement represented developers who had obtained development permission. As such, they were more enlightened on the need to issue Inspection Notices to the planning authority.

### Inspection by Planning Authority during Building Construction Process

The study established from developers if their buildings were eventually inspected during construction by the County Government of Kisii. This aspect was linked to the issuance of Inspection Notices to the planning authority. Results indicated that among those who had issued Notices of Inspection, 92.3% had their buildings successfully inspected compared to 7.2% who were not, thus connoting a major lapse in the development control. Similarly, 98.1% of developments whose owners failed to issue Inspection Notices were not inspected. Additionally, although 1.9% of developers did not issue Inspection Notices, their buildings were still inspected hence signifying inconsistency in the development control process.

The observed relationship was tested for significance using Logistic Regression where the model summary reported a Nagelkerke  $R^2$  of .840. This substantiated that 84% of the variance contained in the dependent dichotomous variable (whether the building was inspected or not) was explained by its dichotomous independent variable (whether Inspection Notices were issued or not). Test of significance demonstrated that issuance of Inspection Notices to invite inspection significantly predicted if such inspections would be undertaken by the planning authority,  $p = .000$  (Table V).

**TABLE V.** THE RELATIONSHIP BETWEEN ISSUANCE OF INSPECTION NOTICES TO PLANNING AUTHORITY AND INSPECTION OF BUILDINGS UNDER CONSTRUCTION

Dichotomous Question	B	S.E.	Wald	df	Sig.	Exp(B)
Did you issue an Inspection Notice?	-6.48	.780	69.14	1	.000	.002
Constant	3.93	.714	30.32	1	.000	51.00

Source: Field survey data, 2018

As demonstrated in Table V, since  $\text{Exp}(B) = .002$  and is less than 1, it means that developers who did not issue Notices of Inspection to the planning authority were 99.8% less likely to have their buildings inspected during the construction process than developers who had issued such Inspection Notices (when “no” was used as a reference within the independent binary variable). This is because the planning authority had no records on when their constructions had commenced. In the past, inadequate inspection of ongoing building projects by concerned authorities has been blamed for the collapse of residential buildings in Kisii Town (Figure III).



**FIGURE III.** A BUILDING THAT COLLAPSED IN KISII TOWN

Source: Gichana and Nyagesiba [35]

As demonstrated in Figure III, six people died after this former ten-story residential building that was under construction collapsed on 10<sup>th</sup> November 2016. Although approved to have five floors, owing to the absence of inspection, the developer added five more floors which made the building unstable. Apart from this building, in April 2015, a five-story flat in Jogoo estate also collapsed after developing large cracks on the ground floor [35]. In a similar setup, a three-story building collapsed in Mwembe estate on 11<sup>th</sup> October 2017, leaving six people dead and several others injured. Despite the fact that the National Construction Authority (NCA) had issued the developer with a Stop Work Notice citing poor workmanship in addition to not filing reports, the developer deliberately ignored the advice. Moreover, although the County Governor promised to investigate the matter [36], no progress had been made by the time this study was concluded.

### Combination of Factors Deterring Inspections during Construction Process

The study lastly investigated if other factors in combination with awareness may have deterred inspection of buildings under construction in Kisii Town. These factors (independent variables) were conceptualized to include obtaining of development permission (binary variable = yes or no) and engagement of registered professionals in building design (binary variables = yes and no). The dependent variable was whether the inspection was undertaken (binary variables = yes and no). Logistic Regression was used as a tool for analysis (Table VI). Computed Nagelkerke  $R^2$  of .863 in the model summary suggested that 86.3% of the variation in the dependent variable was explained by the three independent variables.

**TABLE VI.** The relationship between awareness of inspection, engagement of professionals, obtaining development permission and building inspection

Dichotomous Questions	B	S.E.	Wald	df	Sig.	Exp ( $\beta$ )
Did you obtain development permission?	-2.28	.751	9.22	1	.002	.102
Did you engage a registered professional in building design?	-1.47	.740	3.97	1	.046	.229
Are you aware that buildings should be inspected during construction?	-6.62	1.073	38.08	1	.000	.001
Constant	7.38	1.255	34.59	1	.000	1605.110

Source: Field survey data, 2018

As a norm, the Wald statistics determine the significance of each independent variable in the model. From these results, it can be seen that obtaining development permission ( $p = .002$ ), engaging of registered professionals ( $p = .046$ ) and awareness of inspection requirement ( $p = .000$ ), all added significantly to the model's prediction. Odds ratios interpreted from Exp ( $\beta$ ) column, as a result, reveals that:

- i) The developers who did not obtain development permission were 90% less likely to have their buildings inspected during construction by the planning authority than those who obtained development permission.
- ii) The developers who did not engage relevant registered professionals in the proposed building design were 77% less likely to have their buildings inspected than those who had engaged relevant and registered professionals.
- iii) The developers who were unaware of the requirement of building inspection during construction were 99% less likely to have their buildings inspected than those developers who were aware of the requirement.

Factors induced by developers that contributed to lack of inspection during the construction process were, therefore, summarized to include: failure to obtain development permission, building design using unqualified professionals, and lack of awareness. Planning authority's induced factors that could have undermined the inspections during the construction was also explored. The issue considered was whether a relationship existed between inspection and monitoring. Using a five-point Likert scale (1 = very low, 2 = low, 3 = moderate, 4 = high,

5 = very high), the average rating for inspection was moderate ( $M = 3.183$ ,  $SD = .886$ ) so was the case of enforcement ( $M = 3.339$ ,  $SD = 1.065$ ). Pearson's correlation analysis found a significant positive correlation between the two variables ( $r = 0.757$ ,  $N = 290$ ,  $p = .000$ ). Hence, if the planning authority was to increase monitoring, this would provide an opportunity for increased inspections since developers will be obliged to comply with the statutory requirement. In contrast, if monitoring is not effective, this will negate frequencies of inspections hence motivating developers to contribute to unplanned land use change through unauthorized developments. A linear regression analysis was hence conducted to test the relationship between monitoring and inspection. Adjusted  $R^2$  of 57.6% was significant,  $p = .000$ ,  $F(1, 254) = 347.365$ . The linear relationship indicated that for every additional monitoring attained, enforcement of inspections will increase by about .632.

## CONCLUSION AND RECOMMENDATIONS

This study has demonstrated that although the Building Code [16] grants the County Government of Kisii the statutory powers of monitoring building construction through development control, the mandate is seldom executed. The observed lapse provides an opportunity for developers who not only fail to conform to the approved building plans but equally contributes to non-compliance with recommended physical planning standards, therefore, a gap in the promotion of quality assurance. A product of this is an unregulated land use change leading to unsustainable spatial development. The following policy recommendations are made towards achieving effective quality assurance monitoring of building developments in Kisii Town:

- i) The County Government of Kisii should regularly sensitize developers and registered building contractors on the requirements and importance of having buildings inspected during constructions. This will deepen an understanding of the benefits rather than the punitive nature of quality assurance and development control within the construction industry. As reported before, awareness of building inspection requirement by developers significantly predicted if they would issue Inspection Notices to the planning authority to warrant the statutory quality assurance inspections.
- ii) It was observed during the field surveys that other Government institutions such as NCA and Public Health Department also actively engage in the inspection of building developments in line with legislation that mandates them to do so. To ensure uniformity and consistency during these inspections, the County Government of Kisii should within its administrative structure establish a County Spatial Planning Coordinating Committee to harmonize and coordinate institutions and related agencies that deal with the development control function of building inspection.
- iii) The County Government of Kisii should professionalize land use planning by recruiting and training additional staff to carry out enforcement through monitoring and regular surveillance audits of building developments in Kisii Town.

- iv) There is a need to adopt a strict enforcement and monitoring regime that would ensure that all building developments in Kisii Town are approved. This is because obtaining development permission is a precursor to issuing inspection notices.
- v) The County Government of Kisii should ensure that the design of all proposed building developments is exclusively undertaken by duly registered professionals.
- vi) To ensure that the Building Code addresses the contemporary needs of the construction industry in Kenya, as the case of the Physical Planning Act (Cap 286), it should also be reviewed as a matter of priority in order to align it with the Constitution of Kenya (2010).

The scope of this study was limited to the promotion of quality assurance during the building development process. However, in view of several buildings that have in the past collapsed in Kisii Town, it is proposed that in the future, research needs to be undertaken to determine the nexus between the collapse of such buildings and the extent to which they complied with recommended physical planning standards. The overarching objective will be to empirically determine if the collapse of such buildings could be ascribed to the inadequate development control framework of the County Government of Kisii.

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