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URBAN SECURITY DESIGN AND RESIDENTIAL NEIGHBOURHOOD SAFETY IN LAGOS STATE, NIGERIA

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Abstract: The growing insecurity especially in residential areas of cities has occasioned the engagement of Urban Security Designs (USDs). Residential neighbourhoods in Lagos State are prone to different crimes that threaten lives and properties of residents. Consequently, this study explores the influence of USDs on safety of lives and properties across residential neighbourhoods of Lagos with a view to inform policy decisions on urban security governance in the State. The concept of neighbourhood watch and theory of defensible space provided the framework. Using a mixed method design, and employing a multi–stage sampling technique, the 20 Local Government Areas in Lagos state were stratified into low, medium, and high–density residential areas, from which a total of 1,337 (0.31%) was randomly selected from 430,122 residential buildings and surveyed, by means of questionnaire administration and interview. The result suggests respondents' age was 32.31±10.0 years; 49.6% were males and 55.0% earned ₦63,669.00 ±45,727.00 monthly. Individual residents in low, medium and high densities adopted different USDs in preventing crime: Security light (45.4%), gated–neighbourhood (29.5%), electric wire fencing (10.1%), Close–Circuit Television (3.6%), security alarm (1.9%), window burglary (93.6%), street light (72.3%), low wall fence (31.4%), high wall fence (68.6%) and dead–end–street (41.4%) were the USDs typically used. Ridge Regression revealed that USDs were function of residential neighbourhood safety (β=0.351) at α0.05. The study concluded that USDs have enhanced safety of lives and properties in residential neighbourhoods of Lagos. However, public sector's collaboration with residential neighbourhood's security actors and investment in modern security technologies are required.

Keywords: Urban security design, Crime prevention, Residential neighbourhood safety

1. INTRODUCTION

Rapid urbanization and cities expansion that are not well managed pose greater challenges to residential neighbourhood safety, especially in cities of the developing countries where capacity to respond to security issues is minimal. The evolution of insecurity in the urban centres, especially during the last decade, has considerably altered human understanding of residential neighbourhood safety. Purpura (2002) opined that contemporary residential neighbourhood insecurity has become increasingly complex because the world is experiencing dynamic transformation and population growth couple with the risk of violence and instability. The nature of development in the residential neghbourhoods has destructive consequences for societal stability, for instance, ineffective governance, exclusion and segregation lead to inequality, poverty and violence (Rafaleba, 2012). According to Vimala (2014), residential neighbourhoods are becoming havens for international terrorist and criminal networks. Diverse challenges of residential neighbourhood insecurity made Wall (2015) to state that different cities around the world have been exposed to different types and levels of insecurity and risks with different levels of response in terms of technological innovation, structures of governance and law enforcement to insecurity and risks.

Miller (2009) observed that residential neighbourhood insecurity exacts a high cost on global development. He further expressed that in sixty countries, over the last ten years, violence, crime, incessant bombing and terrorism have significant effect and directly reduced economic growth, hampered poverty reduction efforts and limited progress towards the actualisation of Millennium Development Goals. Robert (2012) noted that a considerable number of middle and lower–income cities exhibit above–average rate of residential neighbourhood insecurity. He stated further that residential neighbourhood insecurity is becoming more widespread and chronic in many of the world's largest–growing cities particularly in Latin America, the Caribbean, sub–Saharan Africa as well as South and Central Asia. While affecting all socio–economic groups in myriad direct and indirect ways, the burden of residential neighbourhood insecurity is heavy on the urban poor.

Ogboi (2013) opined that over the years, the incidences of crime and violence have increased tremendously in Nigerian cities, making some residential neighbourhoods literally inaccessible. The cities experience a wide range of criminal activities ranging from petty to violent and organised crimes. The crimes are also facilitated by institutional weakness and deficiencies in security architecture. Ogboi and Eze (2013) observed that individuals, communities and business owners in Lagos State engage

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urban security design in response to the growing threats of crime due to the inability of the police and other security agencies in providing adequate protection. In order word, people adopt different urban security designs such as window burglary, street lights, low wall fence, security lights, dead–end street, high wall fence, community gate, electric wire fencing, close circuit camera and security alarm. Although these approaches are being used at individual and neighbourhood levels in combating rising crime, armed robbery, violence, kidnapping and other forms of criminality in Lagos State where residential neighbourhood insecurity is becoming a dominant feature (Kwaja, 2016). Hence, improving urban security design or other methods to be adopted in order to enhance residential neighbourhood safety is a concern for contemporary towns and cities in Nigeria. Against this background, this study set out to examine the influence of urban security design on safety of lives and properties in residential neighbourhoods of Lagos, Nigeria.

2. STUDY AREA

Lagos metropolis is located approximately on Longitude 2^0 42^1 and 3^0 40^1 East of the Greenwich Meridian and Latitude 6^0 23^1 and 6^0 40^1 North as the Equator. Lagos shares boundary with Ogun State in the northern and north–eastern part, Republic of Benin in the western parts and Atlantic Ocean in the southern part (Figure 1). The vantage position of Lagos in terms of easy accessibility by air, water and land transport, either from within the country or outside the country, contributed to its sporadic growth and attendant residential neighbourhood security challenges (Balogun, 2018).

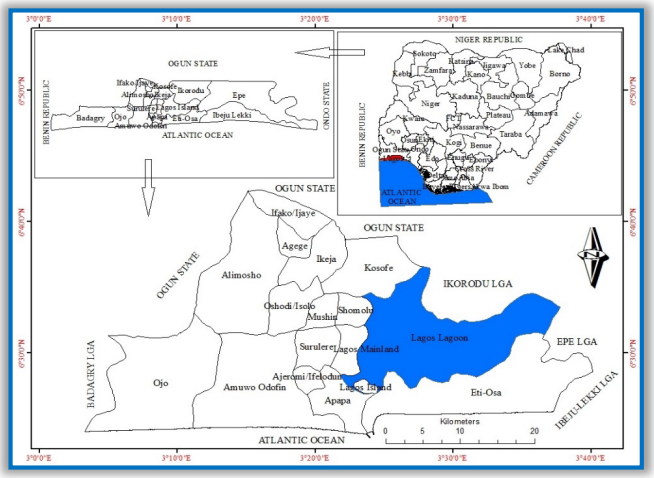

Figure 1: Map of Lagos State in the Context of Nigeria

3. CONCEPTUAL AND THEORETICAL ANCHOR

The concept of neighbourhood watch and theory of defensible space are used as anchors for this study because these are considered appropriate for examining the influence of urban security design on safety of lives and properties in residential neighbourhoods of Lagos, Nigeria. According to National Sheriffs Association (2015), the present American arrangement of neighbourhood watch started in the late 1960s. This was because of the assault and murder of Kitty Genovese in Queens, New York. Rasenberger (2006) remarked that in responding to the event of Kitty Genovese's demise, some nearby occupants shaped gatherings to look out for their private neighbourhood and following out any suspicious action in their neighbourhood in order to enhance neighbourhood safety. Shortly thereafter, the National Sheriffs' Association began a concerted effort in 1972 to revitalise the "watch group" effort nationwide.

National Sheriffs' Association (2015) defined neighbourhood watch or neighbourhood crime watch as an organised group of civilians devoted to crime and vandalism prevention within a neighbourhood. According to Rasenberger (2006), a neighbourhood watch may be organised as its own group or may simply be a function of a neighbourhood association or other community association with the aim of instructing inhabitants of a network on security and wellbeing and accomplishing protected and secure neighbourhoods. Be that as it may, when a crime is suspected, individuals are urged to answer to specialists and not to intercede.

Evans (2006) opined that a sheltered neighbourhood is significant for positive kid and youth advancement. Wilkenfeld. Moore and Lippman (2008) buttressed neighbourhood wellbeing by saying that kids who live in exceptionally steady neighbourhoods have positive results, for example, more grounded association with family, companions and network, and more noteworthy, cooperation in out–of–educational time programs, chipping in and strict administrations. In any case, neighbourhoods that are hazardous are related with high paces of infant mortality and low birth–weight, adolescent crime, secondary school dropout, youngster misuse, disregard, poor engine and social improvement among pre–younger students (To, Cadarette and Liu, 2001). Private neighbourhoods with elevated levels of

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crime are frequently thickly– populated, blended use (private and business), low–salary gatherings, transients, single–parent household female headed family units, broken down private structures, forsake structures and so forth. (Sampson and Groves, 1989; Stark, 1987; Sampson and Raudenbush, 1999). Youngsters and teenagers living in neighbourhoods described by wrongdoing or disorder are bound to become casualties of brutal crime and to execute demonstrations of savagery (Kendrick, Mulyaney, Burton and Watson 2005; Herrenkohl, Maguin, Hill, Hawkins, Abbott and Catalano 2000). Kids who witness crime and brutality are bound to encounter social and passionate issues, for example, animosity, stress and withdrawal, just as misconduct and low school accomplishment (Reich, Culross and Behrman. 2002; Finkelhor, Turner, Ormrod, Hamby and Kracke, 2009). The emergence of different neighbourhood problems as a result of rapid urbanisation gave birth to different thought driven ideas that provide solution to neighbourhood insecurity, among these ideas is defensible space theory.

The origin of defensible space has been linked to Newman (1972), an American Architect who studied high–rise design public residential buildings. Territoriality, natural surveillance, image and milieu (environmental setting) are four physical principles proposed by Newman for the construction of a space that defends itself. The centrality of defensible theory is that urban settings can be used to discourage crime/violence and limit the number of targeted areas in the urban settings that are perceived as suitable for crime and violence by motivated offenders. This can be achieved through physical design that incorporates cues that show how the living space is well–maintained, well care for and, hence, well–controlled. Under such environmental settings, the potential offenders would realise that he or she would be easily recognised and not be tolerated to perpetrate crime and violence.

According to Barnett (1997), crime prevention through environmental design is a tool which modifies the built environment to reduce opportunities for crime. The basic idea behind Crime Prevention Through Environmental Design (CPTED) is the prevention of crime on the basis of relationships between humans and their environment. Traditional tactics of CPTED include creating territoriality, natural surveillance and "eye on the street", and focusing on access into and out of buildings and neighbourhoods. However, early versions also involved vandal–proofing vulnerable aspects of the public realm, also called target hardening.

According to Schneider and Kitchen (2002), the approach of CPTED has been accepted and implemented in urban planning programmes that target the development of safer and defensible spaces, particularly in Britain, and to a larger extent, in North American countries. Though this approach has been accepted and implemented in some parts of the developing countries in Africa, it is not well–pronounced, which is one of the reasons for the increasing urban insecurity in the residential density areas of these developing countries in Africa.

4. METHODS

The research adopted a mixed method design while multi–stage sampling technique was use in data gathering, analysis and presentation. The 20 Local Government Areas (LGAs) were stratified into low, medium, and high–density residential areas based on National Population and Housing Commission's residential neighbourhood stratification data, from which the number of buildings was obtained and updated using the Google Earth. A total of 1,337 (0.31%) was randomly selected from 430,122 updated residential buildings. A structure questionnaire on socio–economic characteristics (gender, age, sex, household, marital status, income); types of urban security design adopted and their effectiveness in enhancing neighbourhood safety (window burglary, street lights, low wall fence, security lights, dead–end street, high wall fence, community gate, electric wire fencing, close circuit camera and security alarm); was administered to the household heads. Key informant interviews were conducted with stakeholders [20 chairmen of landlords' association, 20 Police District Command Officers and 7 Registered Private Security Organisations' Managers]. Focus Group Discussion (FGD) sessions were conducted in the selected communities in the following order: low residential density (1), medium residential density (2) and high residential density (3).

5. FINDINGS AND DISCUSSION

The study revealed that the population of female to male in percentage is approximately 50:50 as presented in Table 1, which is nearly similar to the Lagos population of 52:47% of the United Nations

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Fund Population Activities (UNFPA) (2010) and is in contrary to Adewoye (2013) which established that there are more males than female. In addition to this, by proportion according to the sample selected, 54% of females live in the high residential neighbourhoods, 48% in the low residential neighbourhoods while 46% live in the medium residential neighbourhoods of Lagos. By proportion according to the residential neighbourhoods, this study shows that 54% of males live in the medium residential neighbourhoods, 52% live in the low residential neighbourhoods while 46% live in the high residentials. This implies that there is likely to be gender balances in citizens' participation and representation of interest in policy formulations and decision making on urban security design to influencing residential neighbourhood safety in the State.

In Table 1, the respondents' age is presented according to group. The age of the respondents representing the people of Lagos State was studied and the result shows that 50% of the Lagos population are of ages between 20 and 34 years, followed by those in the age range of 35–49 which shares 27%. This is corroborated by Adewoye (2013) that the youthful age dominates the population as discovered in this research. Summarily, there is clear evidence that 76% of the Lagos population is made up of young and active labour force age while the dependent ages comprise 24% of the entire population, from which 13%, 8% and 2% are of the ages 0–19 years, 50–64 years and 65 years and above respectively. From those within the 0–19 years old, 16%, 15% and 11% live in the low, medium and high–density residential neighbourhoods respectively. Also, from those within the age range 20–34 years old, 52%, 48% and 46% live in the high, low and medium density residential neighbourhoods respectively. Approximately 28%, 27% and 26% of those in the age range of 35–49 years old live in the low, medium and high–density residential neighbourhoods respectively; 10%, 9% and 8% of those in the age range of 50–64 years live in the low, medium and the high–density residential neighbourhoods of Lagos respectively, which clearly reveals that those between 35 years and 64 years mostly live in the low, medium and high–density residential neighbourhoods of Lagos State. It is evident in this research that there is a significant adult population among the residential neighbourhood dwellers that wield power and authority, influence and enact policies, take decisions concerning public life, economic, social and physical development on urban security design to improving the residential neighbourhood safety in the State.

Considering the position of the respondents in the household, 36% of the respondents have their position to be the head from which 37%, 36% and 35% live in the low, medium and high–density residential neighbourhood areas respectively. 31% were adult relatives from which 35%, 30% and 28% are from the medium, high– and low–density residential neighbourhood areas respectively; the child/ward is about 30% of the entire respondents while their distribution across the low, medium and the high–density residential neighbourhood areas are 28%, 27% and 31% respectively. Those who are neither the head, child/ward nor adult relative is about 4% of the respondents (Table 1). This percentage size of the households is significant enough in enhancing quick dissemination of information on residential neighbourhood security issues to the other members in the residential neighbourhood density areas. This is likely to foster compliances to the rules and regulations, cooperation in implementing safety tips on lives and properties, sense of belonging on neighbourhood watch and citizens participation in collective security.

Examining the marital status of the respondents, there is vivid evidence that more than half of the respondents, 59% are singles which is contrary to the 2010 household survey by Lagos State, conducted by UNFPA, where the singles account for nearly two–fifth of the Lagos population. However, 61% and 58% each live in the high, medium and low–density residential neighbourhood's areas respectively. The married respondents take 37% of the respondents while according to the proportion, 40% live in the low–density residential neighbourhoods while 38% and 35% of the married group live in the medium and the high–density residential neighbourhoods of the State. In addition to this, about 3% of the respondents are separated and widow/widower (Table 1). This suggests social disorganisation which is likely to contribute to the increasing rate of criminal activities and other insecurity syndromes, and mounting up challenges on urban security design in the residential neighbourhoods of Lagos. This supports the assertion of Osgood and Chambers (2000) that in the generality of social disorganisation

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theory, juvenile violence was associated with rates of residential instability, family disruption and ethnic heterogeneity. The sociology planners are of opinion that family orb is a grassroot to national development in the sense that family makes a community, community makes a state while state makes a nation. Therefore, if the percentage of those that are married is not significant, it is an indication of social disorganisation which is tantamount to state and national disorganization, and is not likely to help in improving urban security design that will enhance safety of lives and properties in the State. Social disorder or disorganisation needs to be addressed in order to reduce the rate of criminal activities emanated as a result of societal family disorder. This supports the assertion of Wilson and Kelling (1982) that "theorised that crime emanates from disorder and that if disorder were eliminated, then serious crimes would not occur".

Table 1: Gender, age, household, marital status and income

Variables	Options	Description	Density level			Total
			Low	Medium	High	
Gender	Female	Num. of responses	88	193	393	674
		%	47.6%	45.6%	53.9%	50.4%
	Male	Num. of responses	97	230	336	663
		%	52.4%	54.4%	46.1%	49.6%
	Total	Num. of responses	185	423	729	1337
Age	0–19 years	Num. of responses	29	62	85	176
		%	15.7%	14.7%	11.7%	13.2%
	20–34 years	Num. of responses	85	202	380	667
		%	45.9%	47.8%	52.1%	49.9%
	35–49 years	Num. of responses	51	112	191	354
		%	27.6%	26.50%	26.20%	26.50%
	50–64 years	Num. of responses	18	36	58	112
		%	9.70%	8.5%	8.0%	8.4%
	65 years and above	Num. of responses	2	11	15	28
		%	1.1%	2.6%	2.1%	2.1%
Total		Num. of responses	185	423	729	1337
Position in the household	Head	Num. of responses	69	154	252	475
		%	37.3%	36.4%	34.6%	35.5%
	Child/ward	Num. of responses	53	113	229	395
		%	28.6%	26.7%	31.4%	29.5%
	Adult relative	Num. of responses	51	148	220	419
		%	27.6%	35.0%	30.2%	31.3%
	Others	Num. of responses	12	8	28	48
		%	6.5%	1.9%	3.8%	3.6%
Total		Num. of responses	185	423	729	1337
Marital status	Single	Num. of responses	107	244	441	792
		%	57.8%	57.7%	60.5%	59.2%
	Married	Num. of responses	74	162	252	488
		%	40.00%	38.30%	34.60%	36.50%
	Divorced	Num. of responses	2	5	9	16
		%	1.1%	1.2%	1.2%	1.2%
	Separated	Num. of responses	0	2	5	7
		%	0.0%	0.5%	0.7%	0.5%
	Widow/Widower	Num. of responses	2	10	22	34
		%	1.1%	2.4%	3.0%	2.50%
Total		Num. of responses	185	423	729	1337
Average monthly income	N0–N50,000	Num. of responses	106	221	408	735
		%	57.30%	52.20%	56.00%	55.00%
	N50,001– N100,000	Num. of responses	43	110	223	376
		%	23.20%	26.00%	30.60%	28.10%
	N100, 001– N200, 000	Num. of responses	28	74	81	183
		%	15.10%	17.50%	11.10%	13.70%
	N200, 001 – N300, 000	Num. of responses	5	16	15	36
		%	2.70%	3.80%	2.10%	2.70%
	N300, 000 and above	Num. of responses	3	2	2	7
		%	1.60%	0.50%	0.30%	0.50%
Total		Num. of responses %	185 100.00%	423 100.00%	729 100.00%	1337 100.00%

Source: Field Survey (2018)

Table 1 presented the income category of the respondents in Lagos metropolis with those earning not more than N50,000 to be 55%; between N50,001 and N100,000, 28%; N100,001 and N200,000, 14%;

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N200,001 – N300,000, 3% while those earning above N300,000 is insignificant and approximately account for one percent. However, the distribution pattern across the residential density areas specifically reveals that those earning N50,000 and below are not less than half of the population in each of the residential density areas while on the N50,001–N100,000 category, the distribution shows that there are more people in the high residential density earning between N50,001–N100,000 which is 31%, followed by those in the medium residential density with 26% and 23% in the low residential density. From those earning between N100,001 and N200,000, the distribution across the residential density areas shows that there is a concentration of respondents in the medium density residential area with 18% than the low–density residential area with 15% and high–density residential area with 11%. In addition to the income distribution across the density areas, there are more people in the medium density residential area with 4% in the income category of N200,001 and N300,000 followed by those in the low density residential with 3% and 2% in the high–density residential area of the State. Irrespective of the insignificant proportion of the category earning above N300,000, more people are from the low density residential with 2%, 1% in the medium density residential areas and 0.3% in the high–density residential area of the Lagos metropolis. Income distribution of the respondents reveals that their economic power is significant. This is likely to expose them and their properties to different kinds of threats which necessitates the need for a collaborative effort in urban security design to enhance residential neighbourhood safety.

Table 2: Security gadgets

			Density level			Total
			Low	Medium	High	
Remote	No	Num. of responses	183	423	729	1335
		%	98.9%	100.0%	100.0%	99.9%
	Yes	Num. of responses	2	0	0	2
		%	1.1%	.0%	.0%	.1%
Total		Num. of responses	185	423	729	1337
Electric security wire on your fence	No	Num. of responses	152	367	683	1202
		%	82.2%	86.8%	93.7%	89.9%
	Yes	Num. of responses	33	56	46	135
		%	17.8%	13.2%	6.3%	10.1%
Total		Num. of responses	185	423	729	1337
Close circuit camera in your building	No	Num. of responses	166	398	725	1289
		%	89.7%	94.1%	99.5%	96.4%
	Yes	Num. of responses	19	25	4	48
		% within Density	10.3%	5.9%	.5%	3.6%
Total		Num. of responses	185	423	729	1337
Security light in your building	No	Num. of responses	89	258	383	730
		%	48.1%	61.0%	52.5%	54.6%
	Yes	Num. of responses	96	165	346	607
		%	51.9%	39.0%	47.5%	45.4%
Total		Num. of responses	185	423	729	1337
Security alarm in your building	No	Num. of responses	175	414	722	1311
		%	94.6%	97.9%	99.0%	98.1%
	Yes	Num. of responses	10	9	7	26
		%	5.4%	2.1%	1.0%	1.9%
Total		Num. of responses	185	423	729	1337

Source: Field Survey (2018)

The residents of the Lagos metropolis use different urban security design for safety other than fencing among which include: remote doors, electric security wire, Close Circuit Television (CCTV), security light and security alarm. The result of the study as presented in the Table 2 shows that insignificant number of residents in the State as a whole and across the residential density areas use remote doors while 10% of the buildings using electric security wire as part of safety protection against insecurity in their residential neighbourhoods. The distribution of those buildings using electric security wire across the density areas shows that there are more buildings in the low and medium density residential areas with electric security wire with 18% and 13% respectively while 6% of buildings in the high–density residential area are with electric wire. The use of electric security wire in the low–density residential neighbourhoods shows the characteristics of the respondents' income group. In addition to the personal security protection, insignificant numbers of the buildings, (that is, 4% of the entire buildings)

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are equipped with CCTV while 45% have security lights. In measuring the distribution of the presence of the CCTV and security lights across the residential neighbourhoods, more buildings 10.3% in the low–density residential neighbourhoods installed CCTV in their building with 5.9% in the medium–density residential neighbourhoods and 0.5% in the high– density residential neighbourhoods of the State. Furtherance to the personal safety and security protection of the residents, 51.9% of the buildings in the low–density residential neighbourhoods use security light, 39% in the medium density residential neighbourhoods and 47.5% in the high–density residential neighbourhoods. For those buildings with security alarms as part of a protection, insignificant number of buildings in the Lagos metropolis have alarm installed with about 2% of the entire buildings from which 5% of those in the low–density residential neighbourhoods, 2% in the medium–density residential neighbourhoods while 1% in the high–density residential neighbourhoods. The above result is validated by Schneider and Kitchen (2002) that installation and operation of CCTV in the developing countries is a great challenge; a reason for the percentage of the presence of CCTV across the residential neighbourhoods of Lagos State.

Neighbourhood design and planning seek to control the built environment in ways that are intended to reduce or eliminate the opportunity to commit crimes. UN Habitat (2007) asserted that physical design such as building design, observatory, operation cul–de–sacs and management of the built environment play a role in facilitating or diminishing opportunities for crime and violence. The safety of a building depends sometimes on the characteristics of the building in terms of the types of doors, presence of burglar proofs, fence, and so on, while that of a community or neighbourhood depends on the measures put in place by the neighbourhood private security actors to prevent themselves from insecurity. This section of the residential neighbourhood safety study looked at the residents' perception on the experience of the personal safety and building design characteristics in the residential neighbourhoods. Table 3 presented the building design characteristics with respect to safety in the residential neighbourhoods and the outcome of the survey showed that 96% of the buildings in the neighbourhoods are secured with window burglar proofs while insignificant numbers, 6% have no window burglary. In terms of personal security using window burglar proofs, it is observed that 96% in the high–density residential neighbourhoods secured their windows, 94% in the medium–density residential neighbourhoods and 87% in the low–density residential neighbourhoods. This indicates that, for those in the high and medium density residential neighbourhoods securing their windows with burglar proofs shows that there is likely a high number of crimes in the two residential neighbourhoods. Due to this, it has become a custom that people protect their properties with burglar proofs.

There are varieties of doors which include the wooden and iron doors, and it is revealed in this study that the buildings are made of both the wooden and iron doors. The buildings that use wood as doors are about 92% while those with iron doors are 82%. The distribution of the buildings that used wooden doors across the residential neighbourhoods were observed where they are not significantly different across the residential neighbourhoods with 89%, 95% and 90% in the low, medium and high–density residential neighbourhoods of the State. However, the distribution of buildings with iron doors were observed across the residential neighbourhoods and the result showed that 85.4%, 92% and 76% of the buildings in the low, medium and high–density residential neighbourhoods made use of the iron doors. (Table 3)

In addition to the personal safety by the residents of Lagos, more than half, 62% of the buildings are fenced as a means to further protect their properties while out of the fenced building, more than half, that is, 69% have a high wall fence, while 31% are with low wall fence. The distribution of the building with fence across the density areas showed that, there is no significant difference in the building with fence across the three residential neighbourhoods while 86% of the fenced houses in the low–density residential neighbourhoods are with high wall fence while 14% are with low wall fence. Furthermore, out of 67% of fenced buildings in the medium–density residential neighbourhoods, 76% have high wall fence while 24% have a low wall fence and out of the 59.8% of fenced buildings in the high–density residential neighbourhoods of the State, 60% have a high wall fence while 40% have a low wall fence. (Table 3). This result is validated by Liao (2011), Purpura (2002) and UN Habitat (2007) established that wall fence is one of the urban security designs to control crime in the society.

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Table 3: Building design

			Density level			Total
			Low	Medium	High	
Window burglar proofs	No	Num. of responses	25	27	33	85
		%	13.5%	6.4%	4.5%	6.4%
	Yes	Num. of responses	160	396	696	1252
		%	86.5%	93.6%	95.5%	93.6%
Total		Num. of responses	185	423	729	1337
Wooden door	No	Num. of responses	20	23	71	114
		%	10.8%	5.4%	9.7%	8.5%
	Yes	Num. of responses	165	400	658	1223
		%	89.2%	94.6%	90.3%	91.5%
Total		Num. of responses	185	423	729	1337
		%	100.0%	100.0%	100.0%	100.0%
Iron door	No	Num. of responses	27	33	175	235
		%	14.6%	7.8%	24.0%	17.6%
	Yes	Num. of responses	158	390	554	1102
		%	85.4%	92.2%	76.0%	82.4%
Total		Num. of responses	185	423	729	1337
Wall fence	No	Num. of responses	79	133	293	505
		%	42.7%	31.4%	40.2%	37.8%
	Yes	Num. of responses	106	290	436	832
		%	57.3%	68.6%	59.8%	62.2%
Total		Num. of responses	185	423	729	1337
Type of wall fence	Low	Num. of responses	15	70	176	261
		%	14.2%	24.1%	40.4%	31.4%
	High	Num. of responses	91	220	260	571
		%	85.8%	75.9%	59.6%	68.6%
Total		Num. of responses	106	290	436	832
		%	100.0%	100.0%	100.0%	100.0%

Sources: Field Survey (2018)

Table 4 presented the outcome of the respondents' claims on the dead–end street in their residential neighbourhoods. Approximately two–fifth, 41% claimed they have dead–end streets/ cul–de–sacs while nearly three–fifth, 59% affirmed that their community streets link to other neighbourhoods. Although, evidence shows that there is a significant difference in the proportion of the dead–end streets across the residential neighbourhoods in Lagos State. It is vivid that the dead–end street is prevalent in the low–density residential neighbourhoods where there are enough "close streets", 72%, followed by the high–density residential neighbourhoods, 63%. The presence of the dead–end streets is not predominance in the medium–density residential neighbourhoods. The question is, how has the dead–end streets contributed to security and safety of residential neighbourhoods in Lagos?

The effectiveness of the dead–end street/cul–de–sacs outcome is presented in Table 5. Evidence from the outcome establishes that the cul–de–sacs have been averagely effective 77% in the security of residential neighbourhoods in Lagos State with a significant difference in the proportion across the residential neighbourhoods. It is vivid from the outcome that the cul–de–sac is averagely effective 85% in the high–density residential neighbourhoods than others. However, nearly 4% self–confessed that it is highly effective with the highest proportion in the medium–density residential neighbourhoods. This suggests that the cul–de–sac is very effective in terms of security in the high–density residential neighbourhoods of the State. The presence of dead–end street is supported by the UN Habitat (2007) recommendation that it helps to minimise crime and violence.

Table 4: Dead–end streets/ cul–de–sacs

`			Density level			Total
			Low	Medium	High	
Dead–end street	No	Num. of responses	5	97	51	153
		%	27.8%	91.5%	37.2%	58.6%
	Yes	Num. of responses	13	9	86	108
		%	72.2%	8.5%	62.8%	41.4%
Total		Num. of responses	18	106	137	261
		%	100.0%	100.0%	100.0%	100.0%

Source: Field Survey (2018)

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Table 5: Effectiveness of dead–end streets/ cul–de–sacs

			Density level			Total
			Low	Medium	High	
Effectiveness dead–end street	Highly effective	Num. of responses	0	1	3	4
		%	.0%	11.1%	3.5%	3.7%
	Averagely effective	Num. of responses	6	4	73	83
		%	46.2%	44.4%	84.9%	76.9%
	Low effective	Num. of responses	2	3	4	9
		%	15.4%	33.3%	4.7%	8.3%
	None effective	Num. of responses	5	1	6	12
		%	38.5%	11.1%	7.0%	11.1%
Total		Num. of responses	13	9	86	108
		%	100.0%	100.0%	100.0%	100.0%

Source: Field Survey (2018)

On the lighting of the residential neighbourhoods in the night for security purposes, majority, 72% of the residents claimed they have street lights in their community while 28% said they do not have (Table 6). There is a significant difference in the presence of streetlights across the density areas. Evidence shows that 20% of the street lights have been highly effective, 61% have been averagely effective, 18% low effective and nearly 2% is none effective (Table 7). There is a significant difference in the effectiveness of the availability of street lights across the residential neighbourhoods. The proportion in the low–density residential area has the highly effective street lights while, in the high–density residential neighbourhoods it is averagely effective. This result supports Liao (2011), Purpura (2002) as the presence of streetlight is one of the urban security designs to secure the communities against crime.

Table 6: Street lights

			Density level			Total
			Low	Medium	High	
Street light(s) in your community	No	Num. of responses	22	150	198	370
		%	11.9%	35.5%	27.2%	27.7%
	Yes	Num. of responses	163	273	531	967
		%	88.1%	64.5%	72.8%	72.3%
Total		Num. of responses	185	423	729	1337
		%	100.0%	100.0%	100.0%	100.0%

Source: Field Survey (2018)

Table 7: Effectiveness of street lights

			Density level			Total
			Low	Medium	High	
Effectiveness of the street lights	Highly effective	Num. of responses	40	53	101	194
		%	24.5%	19.4%	19.0%	20.1%
	Averagely effective	Num. of responses	83	160	343	586
		%	50.9%	58.6%	64.6%	60.6%
	Low effective	Num. of responses	36	54	81	171
		% within Density	22.1%	19.8%	15.3%	17.7%
	None effective	Num. of responses	4	6	6	16
		%	2.5%	2.2%	1.1%	1.7%
Total		Num. of responses	163	273	531	967
		%	100.0%	100.0%	100.0%	100.0%

Source: Field Survey (2018)

Nearly one–third, 30% of the respondents affirmed that they have community gate with a significant difference in the proportion across the residential neighbourhoods (Table 8). The highest numbers of communities have gates concentrate in the high residential neighbourhoods and the least in the low–density residential neighbourhoods. The characteristics of the low–density residential neighbourhoods with individual gates reflect the presence of community gates in this study. Closely one–fifth 21% of the respondents claimed that community gates are highly effective while 72% affirmed that they are averagely effective (Table 9). However, there is a significant difference in the effectiveness of the community gates across the residential neighbourhoods. Evidence showed that, the available community gates in the low–density residential neighbourhoods are all effective than the medium–density residential neighbourhoods, 93% and high–density residential neighbourhoods, 92%. It could thus be established that as at the time of this research, the community gates are effective for the purpose they are constructed, that is, in securing the communities against crime. The research result on the presence of gate and their effectiveness is validated by the UN Habitat (2007) recommendations

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that gated communities, low–wall fence, observatory, operation Cul–de–sacs and management of the built environment play a significant role in facilitating or diminishing opportunities for crime and violence. To buttress the above result, the community idealism to mount gate in minimising crime and violence is also supported by Perry (1998) that neighbourhood unit principles could be used as a planning instrument to foster security and safety in towns and cities of the world.

Table 8: Community gates

			Density level			Total
			Low	Medium	High	
Community gate (s)	No	Num. of responses	18	106	137	261
		%	81.8%	70.7%	69.2%	70.5%
	Yes	Num. of responses	4	44	61	109
		%	18.2%	29.3%	30.8%	29.5%
Total		Num. of responses	22	150	198	370
		%	100.0%	100.0%	100.0%	100.0%

Source: Field Survey (2018)

Table 9: Effectiveness of community gates

			Density level			Total
			Low	Medium	High	
Effective of community gate(s)	Highly effective	Num. of responses	1	1	21	23
		%	25.0%	2.3%	34.4%	21.1%
	Averagely effective	Num. of responses	3	40	35	78
		%	75.0%	90.9%	57.4%	71.6%
	Low effective	Num. of responses	0	3	4	7
		%	.0%	6.8%	6.6%	6.4%
	None effective	Num. of responses	0	0	1	1
		%	.0%	.0%	1.6%	.9%
Total		Num. of responses	4	44	61	109
		%	100.0%	100.0%	100.0%	100.0%

Source: Field Survey (2018)

Using the categorisation performance indicators on the urban security design as presented in Table 10 shows that the presence of streetlight is excellent in the low and high–density residential neighbourhoods while it is good in the medium–density residential neighbourhoods. However, irrespective of their presence, the effectiveness is considered poor as reported by the residents which is among the cries of the security stakeholders on the rise of crime rate in their residential neighbourhoods. In addition, the presence of gates across low, medium and high–density residential neighbourhoods is poor as well as the effectiveness of the available neighbourhood gates. The dead–end streets are more in the low and high–density residential neighbourhoods, poor in the medium–density residential neighbourhoods while its effectiveness is poor across the densities. However, the result validates Newman (1972), Barnett (1997), Schneider and Kitchen (2002), and UN Habitat (2007) on the proposed urban security design principles of safety in minimising crimes in the community.

Table 10: Indicators of urban security design in density areas

Indicators	% Score			Rating		
	Low	Medium	High	Low	Medium	High
Presence of street light	88	65	73	Excellent	Good	Excellent
Effectiveness of street light in the security of neighbourhood	24	19	19	Poor	Poor	Poor
Presence of neighbourhood gate	18	29	31	Poor	Poor	Poor
Effectiveness of neighbourhood gate in the security of neighbourhood	25	2	34	Poor	Poor	Poor
Presence of dead–end road design	72	8	63	Excellent	Poor	Good
Effectiveness of dead–end road design in the security of neighbourhood	0	11	3	Poor	Poor	Poor

Source: Field Survey (2018)

In analysing urban security designs that determine residential neighbourhood safety in Lagos, a ridge regression was used as it takes care of the categorical variables and penalises the coefficient in order to avoid over fitting. The ridge model is presented in Table 11 at a penalty interval of 2% and the optimal model was reached at iteration 50. Table 12 presented the model summary of the urban security design as functions of safety; 35% of the residential safety could explain the urban security designs across the residential densities. Although, the correlation is weak as it is 12% while the coefficient of determination

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is 11%. Perhaps, the regularisation coefficient is 10% with an apparent prediction error of 90%. In the course of the bootstrapping, the estimate of the expected prediction error is 94%.

Table 11: Ridge Model on urban security designs and residential neighbourhoods' safety

Ridge Models							
	Penalty	Regularisation "R Square" (1–Error)	Standardised Sum of Coefficients	Apparent Prediction Error	Expected Prediction Error		
					Estimate[a]	Std. Error	N[b]
1	.000	.131	1.000	.869	.955	.120	1299
2	.020	.130	.936	.870	.974	.148	1299
3	.040	.129	.887	.871	.940	.118	1299
4	.060	.129	.845	.871	1.103	.317	1299
5	.080	.129	.806	.871	1.066	.248	1299
6	.100	.128	.770	.872	1.079	.236	1299
7	.120	.128	.736	.872	1.064	.280	1299
8	.140	.127	.706	.873	1.055	.272	1299
9	.160	.126	.677	.874	1.129	.346	1299
10	.180	.126	.652	.874	.951	.156	1299
11	.200	.125	.624	.875	1.151	.340	1299
12	.220	.124	.603	.876	.993	.246	1299
13	.240	.124	.582	.876	1.161	.396	1299
14	.260	.123	.559	.877	1.087	.281	1299
15	.280	.122	.540	.878	1.013	.179	1299
16	.300	.122	.524	.878	1.014	.264	1299
17	.320	.121	.507	.879	.962	.161	1299
18	.340	.120	.489	.880	1.003	.238	1299
19	.360	.119	.474	.881	1.036	.274	1299
20	.380	.119	.460	.881	.970	.174	1299
21	.400	.118	.447	.882	1.019	.243	1299
22	.420	.117	.433	.883	1.031	.242	1299
23	.440	.117	.421	.883	1.180	.435	1299
24	.460	.116	.409	.884	.993	.252	1299
25	.480	.115	.398	.885	1.109	.316	1299
26	.500	.115	.387	.885	.885	.095	1299
27	.520	.114	.376	.886	.933	.157	1299
28	.540	.113	.366	.887	1.079	.299	1299
29	.560	.112	.357	.888	1.110	.320	1299
30	.580	.112	.348	.888	1.112	.377	1299
31	.600	.111	.339	.889	1.045	.287	1299
32	.620	.111	.342	.889	.940	.190	1299
33	.640	.110	.334	.890	.973	.160	1299
34	.660	.110	.326	.890	.990	.247	1299
35	.680	.109	.318	.891	1.018	.229	1299
36	.700	.108	.311	.892	1.009	.281	1299
37	.720	.108	.304	.892	.935	.129	1299
38	.740	.107	.297	.893	.964	.174	1299
39	.760	.106	.290	.894	.986	.282	1299
40[c]	.780	.106	.284	.894	.879	.072	1299
41	.800	.105	.278	.895	.989	.280	1299
42	.820	.104	.272	.896	.897	.113	1299
43	.840	.104	.266	.896	1.138	.375	1299
44	.860	.103	.260	.897	.951	.178	1299
45	.880	.102	.255	.898	1.002	.176	1299
46	.900	.102	.250	.898	.949	.189	1299
47	.920	.101	.245	.899	1.124	.385	1299
48	.940	.101	.240	.899	.894	.118	1299
49	.960	.100	.235	.900	.929	.142	1299
50[d]	.980	.099	.231	.901	.937	.198	1299
51	1.000	.099	.226	.901	1.043	.263	1299

Source: Field Survey (2018)

a. .632 Bootstrap estimate (50 bootstrap samples).

b. If N is smaller than the number of active (training) cases, this is due to excluding cases from estimation of the expected prediction error for reason(s).

c. Optimal model: 10 (predictors: High wall fence, Burglary alarm, specified security door/window, Electric wire fence, Close Circuit Television (CCTV) remote security gate security door/window Remote bridge).

d. Selected model: 50 (more parsimonious model within 1 Std. Error of the optimal model, predictors: High wall fence, Burglary alarm, specified security door/window, Electric wire fence, Close Circuit Television (CCTV) remote security gate, Remote security door/window, Remote bridge).

The analysis of variance of the urban security designs is presented in Table 13 and evidence from the result shows that the model of the urban security design is good to fit residential safety in the Lagos residential neighbourhood densities as p–value (0.000) is less than the 5% threshold. However, the

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estimated and standardised coefficients were presented in Table 14. It could therefore be established here that the three major urban security designs that contribute to the model include electric wire and the remote security gate as their p–values 0.009, 0.038, 0.017 respectively are less than the 5% threshold. Thus, the overall model is given as:

Safety = 0.029 (High wall fence) + 0.012 (Burglary alarm) + 0.020 (specified security door/window) + 0.036 (electric wire fence) – 0.001 (CCTV) – 0.079 (Remote security gate) – 0.003 (security door/window) + 0.033 (Remote bridge) ... (1) While the final model to predict the safety in the Lagos residential neighbourhood densities is given as:

Safety = 0.036 (electric wire fence) – 0.079 (Remote security gate) ... (2)

In equation (2) stated earlier, electric wire fence positively contributes to the model while the remote security gate negatively contributes. It could be established from model (2) electric wire fence and remote security gate; electric wire fence positively contributes 13% and 4% respectively into the model while remote security gate negatively contributes 8% to the model.

Table 12: Model summary on urban security designs and residential neighbourhoods' safety

Model summary							
Multiple R	R Square	Adjusted R Square	Regularisation "R Square" (1–Error)	Apparent prediction Error	Expected prediction error		
					Estimate[a]	Std. Error	N[b]
.351	.123	.109	.099	.901	.937	.198	1299
Source: Field Survey (2018) Penalty .980 Dependent Variable: How safe is your community for people to live? Predictors: High wall fence, Burglary alarm, specified security door/window, Electric wire fence, Close Circuit Television (CCTV) remote security gate, Remote security door/window, Remote bridge.							
a. .632 Bootstrap estimate (50 bootstrap samples).							
b. If N is smaller than the number of active (training) cases, this is due to excluding cases from estimation of the expected prediction error for reason(s).							

Table 13: ANOVA of urban security designs and residential neighbourhoods' safety

ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	129.143	20	6.457	7.054	.000
Residual	1170.857	1279	.915		
Total	1300.000	1299			
Source: Field Survey (2018) Dependent Variable: How safe is your community for people to live? Predictors: High wall fence, Burglary alarm, specified security door/window, Electric wire fence, Close Circuit Television (CCTV), remote security gate, Remote security door/window, Remote bridge.					

Table 14: Model coefficients on urban security designs and residential neighbourhoods' safety

Coefficients					
	Standardised Coefficients		Df	F	Sig.
	Beta	Bootstrap (1000) Estimate of Std. Error			
High wall fence	.029	.019	1	2.299	.130
Burglary alarm	.012	.019	1	.392	.531
specified security door/window	.020	.037	1	.282	.595
Electric wire fence	.036	.018	1	4.317	.038
close circuit Television (CCTV)	–.001	.028	1	.001	.975
remote security gate	–.079	.043	3	3.422	.017
security door/window	–.003	.014	3	.042	.989
Remote bridge	.033	.034	2	.928	.396
Source: Field Survey (2018) *Dependent Variable: How safe is your community for people to live?					

6. CONCLUSION AND RECOMMENDATIONS

According to Safer Spaces (2014), safety is increasingly being emphasised internationally as a public good and a precondition for development and reducing inequality. Being and feeling safe contribute immeasurably to people's quality of life, especially for those who are marginalised and most affected by violence. Weakness in the operationalisation of urban security designs and inadequate attention to residential neighbourhood safety by policy makers resulted to the emergence of insecurity in the residential neighbourhoods of Lagos. The study concluded that Urban security designs have enhanced safety of lives and properties in residential neighbourhoods of Lagos. However, public sector's collaboration with residential neighbourhood's security actors and investment in modern security technologies are required.

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