

# **FACTORS AFFECTING BUILDING SECURITY COST IN NIGERIAN URBAN ENVIRONMENT**

**By**

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**Thesis submitted in fulfilment of the requirements  
for the degree of  
Doctor of Philosophy**

**April 2016**

## **ACKNOWLEDGEMENT**

In the name of Allah, the most beneficent and the most merciful, all praises to Almighty Allah for successful completion of this study.

My profound gratitude goes to my supervisor Associate Professor Sr. Dr. Ilias Said, who's without his guidance and tremendous inputs, this thesis would not have a right focus. Also, my appreciation goes to my co-supervisor Dr. Radzi Ismail for his comments and suggestions. I wish to express my appreciation to the Federal University of Technology Minna (FUTMINNA), in collaboration with Tertiary Education Trust Fund (TETFund) Nigeria, for sponsoring my studies throughout.

I would like to extend my sincere appreciation to colleagues and staff of the School of Environmental Technology, Federal University of Technology Minna for their comments, suggestions and help at the data collection stage. I would also like to acknowledge the assistance of every individual professional that participated in the data collection process. My sincere appreciation also goes to the Institute of Postgraduate Studies (USM). Moreover, School of Housing Building and Planning (USM), for its support of the conference paper oral presentation award at ICSEBS2014 Indonesia and PGCB2014 HBP conference respectively.

My immeasurable gratitude goes to my beloved late parents, may Allah grant them Aljanatul Firdaus. To all my brothers and sisters, thank you all for your love, invaluable support and advice. Special appreciation and thanks to my beloved wife Mrs Anifowose Omowumi Kafayat and my kids Faizah, Ameera, Ameenat and Abdulhameed, and all my friends for their love, support, advice and encouragement.

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## **LIST OF ABBREVIATIONS**

ACPO	Association of Chief Police Officers
AIA	American Institute of Architects
ANOVA	Analysis of variance
BCA	Building Code of Australia
BOQ	Bill of Quantity
CCTV	Close circuit television
CME	Construction management and economic journal
CPTED	Crime prevention through environmental design
CSEW	Crime Survey for England and Wales
CSI	Construction specification institution
DAC	Development Assistance Committee
DHS	Department of Homeland Security
DMSA	Diagonal measure of sampling adequacy
DV	Dependent variable
EIA	Environmental Impact Assessment
FBI	Federal Bureau of Investigation
GDP	Gross domestic product
GFA	Gross floor area
GFCF	Gross fixed capital formation
IBC	International building code
IPA	Interpretative phenomenological analysis
ISC	Interagency security committee
ISECOM	Institute for Security and open methodologies
IV	Independent variable
KMO	Kaiser-Meyer-Olkin
LEED	Leadership in Energy and Environmental Design

MAPE	Mean absolute percentage error
MMR	Mixed methods research
MSE	Sum of square error
NIA	Nigerian Institute of Architects
NIESV	Nigerian institute of Estate surveyors and valuers
NIOB	Nigerian Institute of Builder
NIQS	Nigerian Institute of Quantity Surveyors
NITP	Nigerian Institute of Town Planners
OECD	Organization for economic co-operation
OLS	Ordinary Least Squares
QUAL	Qualitative
QUAN	Quantitative
RAT	Routine Activity Theory
RTMS	Repetitive trans-cranial magnetic stimulation
SD	Standard deviation
SPSS	Statistical package for social science
SSR	Security sector reform
SWAC	Sahel and West African club
UAE	United Arab Emirate
UK	United Kingdom
UN	United Nations
US	United States

# **FAKTOR YANG MEMPENGARUHI KOS KESELAMATAN BANGUNAN DALAM PERSEKITARAN PERBANDARAN DI NIGERIA.**

## **ABSTRAK**

Dewasa ini, kos bangunan semakin meningkat dan hal ini menunjukkan bahawa perkadaran yang signifikan daripada kos tersebut mungkin disebabkan perbelanjaan bagi keselamatan bangunan yang semakin meningkat. Keselamatan bangunan memerlukan sesuatu lebih baik bagi menentang peningkatan aktiviti jenayah. Peruntukan langkah keselamatan bangunan diserahkan mengikut budi bicara individu. Minat arkitek dalam merekabentuk bangunan terlindung adalah minima disebabkan kekurangan polisi kerajaan dan kriteria tertentu ke atas keselamatan bangunan. Oleh itu, kajian ini bertujuan mengenal pasti penentu kos keselamatan berdasarkan perspektif pakar binaan dalam pembinaan alam sekitar tentang kos keselamatan bangunan dan memeriksa kebolehan ramalan penentu kos keselamatan dalam persekitaran pembinaan. Pendekatan penyelidikan eksplotari jujukan kaedah bercampur digunakan dalam kajian ini. Dalam fasa kualitatif kajian ini, objektif pertama diperoleh melalui penggunaan reka bentuk penyelidikan fenomenologi dan analisis deskriptif masing-masing. Fasa ini menggunakan persampelan bertujuan dan soal selidik dijalankan bagi mengetahui faktor penting yang mempengaruhi kos keselamatan bangunan dalam persekitaran pembinaan. Fasa kuantitatif kajian ini menggunakan teknik pensampelan berstrata. Soal selidik ini dilengkapi dengan sewajarnya dan dikembalikan oleh 293 responden pada kadar respon 88%. Versi 21.0 SPSS digunakan bagi analisis data. Tambahan pula, objektif pertama dilakukan menggunakan analisis deskriptif, ujian kebolehpercayaan dan kenormalan. Objektif kedua dilakukan melalui penggunaan analisis korelasi bersama ujian hipotesis.

Objektif ketiga dicapai melalui analisis regresi pelbagai. Keputusan analisis menunjukkan bahawa keputusan objektif pertama bagi analisis deskriptif, ujian kebolehppercayaan dan kenormalan mendapati langkah keselamatan dan ciri-ciri bangunan mempunyai perkaitan yang boleh dipercayai dan diterima. Oleh itu, keputusan menjadikan faktor-faktor ini sebagai penentu dalam kos keselamatan bangunan. Keputusan objektif kedua bagi analisis kolerasi bersama ujian hipotesis menunjukkan perkaitan terangkum antara langkah keselamatan dan kos keselamatan bangunan adalah kuat. Ciri-ciri bangunan dan kos keselamatan bangunan juga mempunyai perkaitan yang kuat. Keputusan objektif ketiga bagi analisis regresi pelbagai biasa menunjukkan model tersebut (termasuk langkah keselamatan dan ciri-ciri bangunan) menjelaskan tentang 85% daripada varians dalam kos keselamatan bangunan. Perkaitan yang wujud antara faktor dan kebolehan meramal model yang dibangunkan dalam kajian ini adalah konsisten dengan dapatan penyelidikan terdahulu. Hasil kajian menyebabkan pakar persekitaran pembinaan lebih peka tentang implikasi reka bentuk ciri-ciri bangunan ke atas kos keselamatan bangunan bagi penilaian dan kawalan berkesan. Selain itu, ia dapat menimbulkan kesedaran kepada pakar kaji jenayah dan pembuat polisi dalam membuat pertimbangan kepada ciri-ciri bangunan semasa menilai langkah pencegahan jenayah di dalam bangunan.

# **FACTORS AFFECTING BUILDING SECURITY COST IN NIGERIAN URBAN ENVIRONMENT**

## **ABSTRACT**

Buildings cost more nowadays, and it is an assertion that significant proportions of such cost might be as a result of increased expenditure on building security. Building security is acquiring greater importance against this backdrop of rise in criminal activities. Provision of security measures in buildings are left to the discretion of private individuals. Architects' interest in designing protective building is minimal due to inadequate government policy and specific criteria on building security. Therefore, this study aims at exploring the security cost determinants based on built environment professionals' perceptiveness on building security cost as well as examining the predictive capability of the security cost determinants within the built environment. Mixed methods sequential exploratory research approach was employed in the study. The qualitative phase of this study adopts phenomenological research design and descriptive analysis respectively. This phase used purposeful sampling and conducted interview to explore the security cost determinants within the built environment. The quantitative phase of this study used a stratified sampling technique. The questionnaires that were duly completed and returned by respondents are 293 at 88% response rate. SPSS version 21.0 was used for the data analysis. Moreover, the first objective was pursued through descriptive analysis, reliability and normality test. The second objective was pursued through the use of correlation analysis in conjunction with hypothesis testing. The third objective was achieved through multiple regression analysis. The outcome of the analysis reveals that, the result of the first objective for descriptive analysis, reliability and normality test



found security measures and building characteristics with a statistically reliable and acceptable. Hence, the result has made these factors the determinants of building security cost. The second objective results for correlation analysis in conjunction with hypothesis testing shows that the inclusive relationship between security measures and building security cost had a strong relationship. Similarly, building characteristics and building security cost also had a strong relationship. The third objective result for standard multiple regression indicate that the model (which includes security measures and building characteristics) explains about 85% of the variance in building security cost. The relationship that exists between the security cost determinants and the predicting capability of the model developed in this study are consistent with that of previous researchers. The findings in this study would sensitize the built environment experts, of the design implication of building characteristics on the building security cost for its effective evaluation and control. As well as create awareness to criminologist and policy maker of a need to give due consideration to building characteristics when carrying out an evaluation of crime preventive measures in buildings.

# **CHAPTER 1:**

## **INTRODUCTION**

### **1.1 Background**

Security is increasingly having importance attached to it worldwide. The historical background of housing cannot be separate from criminal activities committed within houses. In some scenarios, the level of security of a locality tends to form the basis for the measurement of its social and economic development. The security of life and properties within the built environment is of great importance to the socio-economic, health and general wellbeing of people around the globe. According to Maxwell (2006) adequate security brings about safety and ensures social, economic and political order that enables the city to function well and which allows the citizen to succeed in life. Conversely, insecurity has serious negative social, economic and policy implications. It however, creates a situation of fear and anxiety that affects the people's psychological state of mind and the level of their productivity (Edelman, 2013; Hirst, 2013). Thus, security is a global matter that requires urgent attention from government and stakeholders worldwide (Morenikeji et al., 2008).

According to UN-Habitat (2007) crime and violence are major threats to human security. Thus, safety against crime and violence results in fear and insecurity. Moreover, crime and violence are being recognized globally as a general phenomenon and also as a fundamental human right. Despite the fact that criminal activities are all over the places, most of the cities are still secure. However, many of the citizens are neither victims of crime and violence nor perpetrators. Thus, crime is

minimal in certain parts of a city and in neighbourhoods that are well brand by the police and the citizens.

Further investigation into crime rates shows that crime occurrence recorded for every 100,000 people over the period of 1980 – 2000, rose to 700 crimes committed. An indication that criminal activities are on the increased (Lott, 2013). However, the trend varies across the globe. Latin America, Caribbean, Eastern Europe and Africa, recorded an increased in crime rates. While, there was a significant fall in crime rates in North America and Western Europe over the last two decades. Thus, the variations in crime and violence are more pronounce regionally when a particular type of crime is investigated. However, Wilson et al. (2010) viewed homicide as an underlying indicator of changes in socio-economic condition, race, poverty and social isolation in their study of localized homicide patterns and prevention strategies. Thus, the changes vary with respect to time and geographical location. Fenoberova et al. (2012) indicate that population is one of the key factor responsible for the criminal activity, as the nature of violence changes from global outbursts. Caribbean, Latin America and the Africa recorded double-digit figures. While country such as Europe, Eastern Mediterranean, Southeast Asia and West Pacific region recorded significant low rates. Colombia, Guatemala, Jamaica, South Africa and Venezuela had very high homicides rates at the national level. While Cyprus, Japan, Qatar, Norway, Saudi Arabia and Spain reported having considerable low rates in contact crime (LaFree, 2012; UN-Habitat, 2007).

Crime and violence are typically more severe in urban areas and are compounded by its rapid growth. According to Ahmed (2012), the growth in urban crime has become

a major problem facing most developing countries. The concentration of crime in these countries escalates the unpredictability of the issue for it pyramids one fear upon other worldwide. In some parts of Latin America countries and Africa, the study revealed that 60 percent of urban dwellers in developing and transitional countries have been the victims of crime, with victimization rates reaching 70 percent. Wilson et al. (2010) found homicide as the underlying indicators of changes in socio-economic condition, race, poverty and social isolation. The study further reveals that homicide varies with respect to time and geographical location. In Rio de Janeiro, the homicide rate has tripled since the 1970s while the rate in Sao Paulo has quadrupled.

In Africa, cities such as Cape Town, Durban, Johannesburg, Lagos, and Nairobi accounted for a sizeable proportion of their nation's crime. Burglary is highly reported in most African urban areas (Marzbali et al., 2010; Vollaard & van Ours, 2011). With victimization rates of above 8 percent of the population. Although a non-violent crime, burglary is a serious offence in most Africa countries. Burglary tends to be partly motivated by poverty even though material possessions are fewer while robbery is one of the major intimidating crimes to urban areas in many Africa countries. However, results in injury, loss of property, and increases the general fear of crime and feeling of insecurity. According to UN-Habitat (2007), a total of 460 robbery cases were recorded for every 100,000 people in South Africa in the year 2000. Thus, 30% of people resides in Johannesburg reported having been victims. Crime in Nairobi over half of the citizen of Nairobi worried about crime very often. While in Lagos, it was reported that 70% and 90% of respondents in a city-wide survey were fearful of being victims of crime, and being murdered in criminal attack

respectively. Regionally, the victimization rates for robbery are much higher in Africa and Latin America than in other regions of the world. The fear of crime and violence is pervasive in both developed and developing countries. Public opinion surveys in the US and the UK repeatedly show that people rank crime among the top concerns they have in everyday life.

Furthermore, residents of cities in developing, transitional and developed countries have to contend with increasing levels of domestic violence, child abuse, and proliferation of youth gangs, corruption and various forms of organized crime. Cities are increasingly becoming targets of terrorist attacks. Notable examples include the assault on the World Trade Centre in New York on 11 September 2001. The coordinated bombings in Madrid, March 2004. The London bombings of July 2005, and the bombing of commuter trains in Mumbai in July 2006. This Global Report notes that the incidence of terrorist attacks is significantly small in comparison to common crime and other types of violence. For example, the US National Counterterrorism Centre reported 13 terrorist incidents in the US in May 2005. Also, the Federal Bureau of Investigation (FBI) identified 10.32 million property crimes and over 1.36 million violent crimes. However, the impacts of terrorism on cities have been enormous. For example, the attack on New York left about 3500 people dead. It also resulted in the destruction of about 2.8 million square meters of office space in Lower Manhattan and damaged the Port Authority Trans-Hudson train station at the World Trade Centre. A multiplicity of factors underlies the observed trends in crime and violence. These include social and cultural factors that might exacerbate or mediate crime. For instance, in cities such as Kabul, Karachi and Managua, Violence is so interwoven into the fabric of daily life that it has become

the norm for many slum dwellers. On the other hand, in Hong Kong and other parts of East and Southeast Asia, Confucianism-based family values and a general submissive 'pro-social' population are major factors in keeping crime and violence low. Other factors associated with urban crime and violence are poverty, unemployment, inequality and intergenerational transmission of violence as reflected in the continuous witnessing of parental abuse during childhood. Also, the rapid pace of urbanization, poor urban planning, design and management, growth in youthful population and the concentration of political power, which facilitates corruption. The impacts of crime and violence are multidimensional. Apart from injury and death, victims of crime and violence suffer long-lasting psychological trauma and continuously live with the fear of crime (Barnett et al., 2010) . At the national level, crime and violence are impediments to foreign investment, contribute to capital flight and brain drain, and hinder international tourism. In Jamaica, for instance, high levels of homicide have adversely affected tourism and contributed to brain drain. At the local level, crime and violence result in the stigmatization of neighbourhoods or even entire sections of the city. Such areas become 'no-go' zones and eventually lose out in terms of investment or provision of infrastructure and public services (Muggah, 2012).

Property security is an important research topic; security in this respect covers the incidence rate of fire in residential buildings, which in Saudi Arabia accounts for 69% of all building fires. The survey showed that most residents are ignorant of many safety aspects in their homes. Abrahamsen and Williams (2009) postulated that Security Sector Reform (SSR) has become a central part of development policy, given an increasing recognition of the links between security and development. They

observed however that following a traditional Weberian conception of the state, such reform programs are almost exclusively focused on the public security sector. Neglecting the extent to which people in developing countries have come to rely on private security providers for their day-to-day security needs.

The Crime Survey for England and Wales (CSEW) estimates that 2.1 percent of households in England and Wales were burgled in 2012/2013 and experienced 694,000 burglaries. The impact of a burglary on victims is significant and includes considerable psychological costs also to the financial costs of replacements and repairs (Tseloni et al., 2014) . In tackling the menace, several households have adopted security measures of different types. Victim support and crime prevention officers regularly advise victims of crime on improving aspects of their home security. However, security is generally at the discretion of the individual in the United Kingdom as there is no government support, unlike the ‘green’ intervention. The utilization of protective security measures is escalating in most countries, with the highest levels in developed countries. Thus, correlates with a higher proportion of attempted rather than successful burglaries in these countries (Tseloni et al., 2014). Houses with no or low-level security have seven times and 75% respectively, more burglaries than houses with high-level security (Pease & Gill, 2012). A study conducted by (Vollaard & van Ours, 2011) shows the significant of security protection on the newly built houses fortified with burglary protection in Netherlands. The burglary rate dropped in areas with new housing but without displacement to areas with older less-protected houses. It was concluded that in 2010, the national burglary rate in the Netherlands was 5 percent lower than it would have been otherwise.

Serious crime has grown to nearly epidemic proportions, particularly in urbanized areas in Nigeria. Characterized by rapid growth and change, by stark economic inequality and deprivation, by social disorganization, and by inadequate government service and law enforcement capabilities (Usman et al., 2012). Most information services regard the published crime statistics as grossly understated. Most of the states in the country are un-policed. The police concentrated in urban areas where only about 25% of the population live while public distrust of the police contributes to underreporting of crimes (Alemika, 2013). Annual crime rates fluctuate around 200 per 100,000 of the population until the early 1960s and then steadily increased to more than 300 per 100,000 by the mid-1970s. Total reported crimes rose from almost 211,000 in 1981 to between 330,000 and 355,000 during 1984-85 (Usman et al., 2012). Although serious crime usually constituted the larger category, minor crimes and offences accounted for most of the increase. Crimes against property accounted for more than half the offences with the thefts, burglary and breaking covering 80 to 90 percent in most years. Assaults constituted 70 to 75 percent of all crimes against persons (Jones, 1993).

While literature searches provides evidence that the security of persons and property are essential to both individuals and government, works on empirical relationships between infrastructure costs and security-related costs have not received detailed research attention.



## **1.2 Problem Statement**

The cities of the 21<sup>st</sup> century are complex entities that emerged as products of urbanization and globalization. They are a collection of the good and the bad aspects of urbanization. They reflect the hope and the fear of the modern world. As the cities offer opportunities for innovation and the creation of wealth, they are also faced with problems of disaster, crime and insecurity amongst others. Urban insecurity is a major problem of concern in all nations (Hove et al., 2013). Crime is an economically important activity that is almost entirely neglected by economists. However, the neglect makes the economics of crime a relatively new field for economic investigation as some reports, and studies confirmed the outstanding increase in criminal activities over last four decades in Nigeria (Omotor, 2010). The broader literature on the effect of self-protective measures on victimisation tends to ignore simultaneity in the relation between security measures and crime. The existing literature on the regulation of building security is either descriptive in nature or small-scale local intervention (Vollaard & van Ours, 2011).

In Nigeria, the problem of insecurity has been attributed to inability of the government to develop a credible security policy in the face of serious, threatening internal security challenges (Robert-Okah, 2014). According to Walter and Robert (1995) 'Building security is not just about installing the latest electronic gear and software package. Nor is it just a consideration for building types with highly specific occupancy considerations. Increasingly, buildings of all sorts are candidates for the kind of careful security planning that proceeds hand-in-hand with the architectural design process. To ensure an appropriate and cost-effective level of security, architects need to acquaint themselves with the range of security factors that

affect design'. Tseloni et al. (2014) states that provision of security devices for protection of life and properties within buildings are left to the discretion of private individuals, no government support. Evidence from natural experiment in the regulation of built-in security components shows that buildings fortified with security components and gadgets were highly restricted (Vollaard & van Ours, 2011), but resulted in a relatively increase in cost of building security as well as the general price of the home.

The escalating rate of burglars in town and cities has given rise to diverse responses to residential burglary and other types of dreadful crime in Nigeria (Badiora et al., 2014). There is a general trend towards construction of: (i) high perimeter fence around residential unit in Nigerian cities, (ii) Erection of houses are intricately shielded with burglary proofing, (iii) construction of massive gates and strong locks, (iv) installation of security lighting at every corner of the building environment, and (v) a host of other protective devices. All of which give credence to the assertion that city architecture in Nigeria today is governed by the fear of incursion by burglars. The cost of all these measures, whether social, environmental, and/or monetary and extent to which they have reduced crime are all issues worthy of empirical investigation (Agbola, 2004; Olajide & Kolawole, 2013).

Building security is acquiring greater importance against this backdrop of a rise in burglary activities. However, the empirical relationships between building security measures (descriptor factors), characteristics of building (influence factors) and costs of maintaining safety in buildings have yet to be derived. Notwithstanding the

proliferation of documented incidences of burglary, breaking, armed robbery and terrorism, to mention but a few.

The novelty of this study stems from critiques concerning the cost of the situational crime prevention. Criminologists believe that strengthening deterrence by increasing the weight of punishments would be easier than manipulating or remodelling the opportunity structure with increase spending and difficulty. Thus, situational prevention is an architectural way of tackling crimes within the built environment (Felson & Boba, 2010). According to Jacques and Reynald (2011) imprisoned offenders reported higher fear of getting caught rather than the details of the punishment they would potentially receive if caught. Increasing the risks of being caught is thus a critical category of the situational prevention theory. Although some of the techniques of this approach usually come at a certain cost, sometimes too expensive and thus unavailable to the average citizens. Design safe principle of situational crime prevention commonly employ within built environment includes: (i) target hardening, (ii) access control, and (iii) formal surveillance (Cornish & Clarke, 2014). These are the measures that tend to reduce the criminal opportunity, exclude potential offenders while police provide formal surveillance, security guards and store detective. Tseloni et al. (2014) revealed some of the security measures with high effectiveness and in great cost in burglary prevention to includes: (i) burglary alarm system, (ii) electronic window sensors, and (iii) closed-circuit television. Thus, several researches have been conducted on the trends in crime rate, prevention of crime as well as burglary, effectiveness of security devices but there is lack of sufficient literature on building security cost.

Furthermore, the crime rate and increasing awareness of the problem have directed more attention toward the important role the building design play in security. Smith

and Bryant (2010) confirmed that security-related costs arise from security design principles applied to newly constructed buildings and modification of existing structures. However, the Architects' interest in designing protective buildings for their client is minimal. "They traditionally leave such demands to their clients, who usually are unaware of the availability of protective hardware and who are rarely competent to deal with the problems of protective design" (Fischer et al., 2008). However, this could be as a result of high cost of acquiring the protective hardware or devices and incorporating of adequate security components for the protection of life and properties in buildings. It is an assertion that increasing cost of building security affects the total cost of building. Also, there might be some factors of building or characteristics of building that might be affecting building security cost within the built-environment.

Therefore, there is a need to determine the security cost determinants of building security. The factors that constitute the cost and those that might be affecting the cost of building security within the built environment using mixed method sequential exploratory research design as a result of inadequate literature available on security cost determinants of building security. The findings from this study will lead to an improvement for efficiently evaluating, controlling as well as forecasting of the probable future building security cost. In addition, study conducted by Robert-Okah (2014) affirmed that there is lack of government policy on building security and specific criteria on residential, commercial and other types of building in Nigeria and this has lead to: the exploration and ascertaining the security cost determinants, the relationship between the security cost determinants, and assessing the predictive capability of the security cost determinants on building security cost, as the following

research questions required. In addition, Table 1.1 present a matrix table showing the summary of security measures adopted in building as a result of increasing rate of burglary in Nigeria.

**Table 1.1: Summary of Security Measure Adopted for Burglary Prevention**

<b>Preventive measures</b>	<b>Sources</b>
Escalating rate of burglars in town and cities of Nigeria.	(Ahmed, 2012; Badiora et al., 2014; Omotor, 2010; Usman et al., 2012)
Residents' response to burglary through construction of high perimeter fence, erection of houses are intricately shielded with burglary proofing, construction of massive gates and strong locks, installation of security lighting at every corner of the building environment, and a host of other protective devices,	(Agbola, 2004; Badiora et al., 2014; Olajide & Kolawole, 2013)
Target hardening, access control and formal surveillance and territoriality.	(Cornish & Clarke, 2014; Cozens, 2008; Marzbali et al., 2012b)
Burglary alarm system, electronic window sensors and closed-circuit television are highly effective and in great cost in burglary prevention.	(Cozens, 2002; Tseloni et al., 2014)
Building security cost arises from security design principles applied to newly constructed buildings and modification of existing structures.	(Cozens, 2002; Smith & Bryant, 2010)

### **1.3 Research Questions**

There is one main question guiding this research which in turn supported by two other questions:

Main Question:

- 1) What are the determinants of Building security cost within the built environment in Nigeria?

Sub Question:

- 2) Are there any significant relationships between security cost determinants (i.e., security measure factors and building characteristics factors) and Building security cost within built environment in Nigeria?
- 3) What is the predictive capability of the security cost determinants (i.e., security measure factors and building characteristics factors) on building security cost within built environment in Nigeria?

#### **1.4 Research Objectives**

The main aim of this study is to explore the security cost determinants based on built environment professionals' perceptiveness on building security cost as well as examine the predictive capability of the security cost determinants within the built environment. Thus, this can be achieved through the following objectives:

- 1) To establish and ascertain the security cost determinants of Building security cost within the built environment in Nigeria.
- 2) To determine the relationship between the security cost determinants (i.e., security measure factors and building characteristics factors) and Building security cost within built environment in Nigeria.
- 3) To provide a model for predicting Building security cost within built environment in Nigeria.

#### **1.5 Research Design**

To answer the research questions and meet the objectives of this study, the researcher has adopted the Mixed Method approach which relies on both qualitative and quantitative techniques (Pg 103, 3<sup>rd</sup> Para). The quantitative techniques tend to be

dominant in construction management research (Andrew, 2008), while Mixed Method Research (MMR) has prevailed in social and behavioural studies (Creswell, 2003; Tashakkori & Teddlie, 2003). However, the current research setting as defined by the key questions has made the use of MMR inevitable. The first phase used qualitative study to explore the essential factors influencing building security cost within the built environment in Nigeria which offered the purposeful selection of built environment professionals (Pg 114, 2<sup>nd</sup> Para). These professionals represented the selected samples on which the researcher conducted semi-structured interviews to explore the factors influencing building security cost and to evaluate the factors established. The second phase of this study employed quantitative techniques which generalized the outcome of the first phase (Qualitative), and offered stratified selection of the built environment professionals. The sequence of the methods in the research design is significant because it belongs to its own classification called the Mixed Method Sequential Exploratory Research Design. The findings were resolved and interpreted through the analysis of the results that have been integrated from both methods (See Figure 3.1b & 3.2).

## **1.6 Motivation for the Study**

Buildings cost more nowadays, and it is an assertion that significant proportions of such cost might be as a result of increased expenditure on building security. Smith and Bryant (2010), affirmed that security-related costs arise from security design principles applied to newly constructed buildings and modification of existing structures. However, various factors constituting the cost of building security as well as those factors influencing the cost of building security are yet to be established. Although, some researchers have conducted studies on empirical relationship of

security trends in Nigeria and other countries but not linking infrastructure or building security to the private individual within the built environment (Vollaard & van Ours, 2011). Thus, little research has been carried out with respect to building security cost in Nigeria. The targets of the previous studies are mostly on the trend in crime, demographic and socio-economic issue related to crime, security challenges and prevention. According to Badiora et al. (2014) the spatial reactions utilizing CPTED and SCP standards to burglary in Nigeria now differed from interventions for buildings (e.g., security gates and fencing) to physical protection of properties (e.g., burglary proofing). The increase in burglary activities within and at victim's residences has forced residents to seek the greater security of life and property; this necessarily involves increased expenditure of the building project. Therefore, it is necessary to establish a framework of factors influencing the cost of building security within the built environment which could serve as useful tool for evaluating building security.

### **1.7 Significance of the Study**

This study established a framework of factors influencing building security cost within the built environment and provide model for evaluation of building security cost. The results of this study are expected to benefit stakeholders within the built environment (i.e., Architects, Builders, Quantity Surveyors, Urban and Regional Planners), sensitising them of the function of building characteristics in solving the problem of insecurity (i.e., burglary). It will enhance the application of security measures components at design stage and subsequently lead to effective evaluation of building security cost and to be itemised in the bill of quantity. The results are also expected to benefit the policy makers to come up with a building regulation that will



ensure the clients compliance with the inclusion of necessary security measure at construction stage. Therefore, this will improve the safety of life and properties in buildings and reduce fear of crime among the residents and the community at large.

### **1.8 Research Scope**

This study is based on the built environment professionals' perception towards cost influencing factors of building security. The study covered the registered professionals that have been certified by their respective institution or professional body. On the course of data collection, Minna and Abuja were chosen due to the closeness of the two cities and the presence of the professionals that formed the population of this study. The institutes of most professional body are located in Abuja, and a host to large number of the built environment professionals as a result of high volume of work that offers good opportunity to the professionals. These professionals include: Architects, Builders, Quantity Surveyors, Urban and Regional Planners, and Estate Surveyors and Valuers. The choice of these professionals was based on planning, design, evaluation and construction of the building within built environment.

This study focus on the general issues of burglary (crime against life and properties) as emanated from literature review in Nigeria on incidences of burglary and prevention measures adopted by the building owners. Smith and Bryant (2010) confirmed that security-related costs arise from security design principles applied to newly constructed buildings and modification of existing structures. Also, previous studies have shown a relatively high trend toward building security measures with construction of high fence, building cover with burglary proofing, massive gate and

strong locks, security lighting and a host of modern security devices. Agbola (2004) affirmed that all of measures give credence to the assertion that city architecture in Nigeria today is governed by the fear of incursion by burglars while Olajide and Kolawole (2013) challenged the researchers on several issues concerning building security as well as duelling on cost of protective measures in Nigeria. The residents' responses to crime of burglary (breaking and entering) through the use of features of physical settings has lead to exploration of the factors influencing building security cost within the built environment in Nigeria. Thus, the study adopted mixed method sequential exploratory research design for it data collection and analysis as a result of lack of adequate literature on building security cost.

## **1.9 Organization of the Thesis**

This thesis is organized into six chapters; Chapter 1 provides background information, including the problem statement, significance of the study, research questions, research objectives and the scope of the study.

Chapter 2 presents an overview of the security challenges and the threats to lives and properties in human settlement. The empirical review of security activities within the built environment, the function and the operational requirement of the physical project, building classification, types and nature of building were presented. Furthermore, crime deterrent measures, crime prevention through environmental design, crime prevention measures in building and building cost were discussed in this chapter. Also, existing models of crime prevention such as; routine activity theory, environmental criminology, and situational crime prevention theory were covered. Also, an overview of factors influencing building security cost, the

relationship between security measures, building characteristics and building security cost and the theoretical framework together with its hypothesis were presented in this chapter.

Chapter 3 presents the research methodology. The chapter discussed the main issues relating to the research approach, design, and the analytical techniques employed in the study. This chapter explains the procedures in mixed method research (MMR) design and further provides justification for the relevance of MMR in construction management research.

Chapter 4 presents the qualitative research design, data collection procedure using phenomenological research design and categories identified to sort responses to the questions. Data analysis employed the used of frequency and percentage to rank the response of the respondents. Also, the chapter presents the results of the qualitative analysis. Rank factors accordingly to reflect their impact on building security cost.

Chapter 5 presents the quantitative research design, data analysis, research findings, reliability and normality of the data, the validity of the constructs, correlation analysis and multiple regression analysis in conjunction with hypothesis testing. The chapter reports the results of the study, its analysis and discussion.

Chapter 6 presents the overall findings of both qualitative and quantitative phase. Concludes based on the findings and made recommendations for future research. The study identifies implications for security cost determinants of building security cost and offered suggestions for implementation and future research.

## **CHAPTER 2:**

### **SECURITY CHALLENGES AND PREVENTIVE MEASURES**

#### **IN BUILDINGS**

##### **2.1 Introduction**

This chapter presents the related and the relevant information to this research study. Review the theoretical and empirical studies of security activities within the built environment, functions and classification of buildings, types and nature of buildings. Also, crime deterrent measures, crime prevention through environmental design and crime prevention measures in building. Furthermore, the cost of building, existing models of crime prevention, routine activity theory and situational crime prevention theory are discussed in this chapter. Finally, this chapter establishes and discuss the factors that might be influencing the cost of building security within the built environment. The theoretical framework that connects those factors was developed and the hypothesis for testing the relationships between the variables were formulated in this chapter.

##### **2.2 Security Challenges and Threats**

Security and insecurity have become a hot topical issue both in relation to dynamics changes and the risks violence and instability pose for the process of regional integration, growth and poverty reduction, all these experiencing rapid transformation and population growth worldwide (Black & Swatuk, 2009). Many studies have been carried out by international specialists and institutions on how to tackle the problem of insecurity in developing countries. For instance, members of the Organization for Economic Cooperation, Development (OECD) and

Development Assistance Committee (DAC). Furthermore, United Nations agencies and research institutions have been working tirelessly for some years developing guidelines for good practice in Security System Reform (Klugman, 2010). Nevertheless, many West African actors do not instantly see the significance of the model to the problems been faced, given the political, societal and cultural specificities of the region and the complex nature of the conflict. Sahel and West Africa Club (SWAC) consultations on conflict and stability, highlight the need to develop a concept and vision of security tailored to West African realities by regional partners (PEñAS, 2010).

The international community has tried to make such definitions working by combining the two agendas “freedom from fear” and “freedom from want”. This wider concept of security supports rebuilding processes in countries emerging from violent conflict (Fukuda-Parr & Messineo, 2012). For instance, in West Africa, national recovery strategies based on reconciliation (at the national and local levels) sit alongside economic revitalization and institution building. Also, Security System Reform and the maintenance of peacekeeping forces in the country or region affected by conflict, to consolidate the peace building process. Violent conflict is detrimental to human security. Grayson (2010) acknowledged the interconnectedness and regional dimensions of African conflicts, he suggested that there is a need for an overarching continental and regional strategy for peace and security.

Security is no longer only the concern of defence and humanitarian actors. Since post-Cold War, the security debate has become an attractive topic of the international development agenda (PEñAS, 2010). Traditionally, focused on: (a) military

activities, (b) the control of military hardware, (c) action against armed groups, and (d) networks and the reform of state military institutions. However, the increasing attention is now directed to other actors within the security system. Thus, the softer side of security includes: (a) governance of security institutions, (b) The links between security and insecurity, (c) Access to resources, (d) Well-Being, (e) poverty, and (f) environmental risk, and security.

The international community started placing emphasis on security matters about developmental issues since the early 1990s. An agreement was reached to broaden and deepen the concept of security, taking into account the political context of post-Cold War (PEñAS, 2010). Robust collaboration also came into existence between development, foreign policy and defence institutions within governments. These, however, provide a new basis for North/South relations on the issues (Fukuda-Parr & Messineo, 2012). OECD countries, for instance, Norway, Canada, Japan and United Nations bodies have contributed to the sustenance of human security firmly on the global political and development agenda. Gómez and Gasper (2013, January) claims that threats and security challenges surpass national defence, law and order to embrace political, economic and social issues that guarantee a life free from risk and fear. The focus has shifted from the State to the security of persons. However, these are not mutually exclusive. Security can be thought of as a “public good”, responding to the strategic need to support sustainable human development at the same time as promoting national, regional and global peace and stability.

The human security approach has also made it clear that any attempt to address security related matters must based on consultation and collaboration with different

sets of actors that often have different interests. For example, civilian or military, governmental or non-governmental, local, national, regional, or international. Nevertheless, the process has been difficult for international actors to reach agreement on a single authoritative definition of security. To support the international community in effectively tackling the diverse challenges and threats, that includes violent conflict, crime, disenfranchisement, economic deprivation, and environmental degradation (Gómez & Gasper, 2013, January).

The security of lives and properties in the human settlement is of great importance to the socio-economic, health and general wellbeing of people worldwide. Adequate security brings about safety and ensures social, economic and political order that enables the city to function well and which allows the citizen to prosper. On the other hand, insecurity has serious negative social, economic and political implications. It creates a situation of fear and anxiety that affects the people's psyche and the level of their productivity. Delice (2011), see crime as a devastating social problem, facing every society. Thus, urban security is an issue of global importance which concerns both the government and the stakeholders across the globe. However, incidences of burglary left two types of damages. These are a loss of possessions and fear of crime on its victims. About 146,238 burglaries reported in a year evidenced from Turkish National Police Headquarter while more than 2 million burglaries were confirmed committed in the United States in the year 2009 (Delice, 2011). The study used one of the new theory; Routine Activity Theory to explain burglary. The findings from the study revealed that burglary fit perfectly with the definitions of the RAT. Regarding the theory, crime occurs when the following three elements come together in any given space and time. The elements are: (1) an accessible target, (2) the

absence of capable guardians that could intervene, and (3) the presence of a motivated offender.

As it were, the 20<sup>th</sup> century witnessed an unprecedented level of population growth, migration, and urbanization. These have resulted in the urban insecurity problem (Ma & Lian, 2011). According to Logan and Molotch (2007) the threats to urban security stems from the process of urban growth and interaction of social, economic, and institutional behaviours within the city. Thus, there is a positive correlation between criminality and level of urbanization. The city structure provides shelter for man and security through security institutions. In the past, these security functions were guaranteed and provided by the ancient cities of Rome and Greece. However, as humans settlement grew in spatial extent and functional complexity. This anxious role of the city is seriously threatened in modern times.

Global statistics on urban violence and crime shows frightening figures that many of the world towns and cities are under security threats. For instance, there was an increase in crime per 100,000 persons from 2,300 in 1980 to 3,000 in the year 2000. It implied that the rate of crime per 100,000 people increased from 6.0% in 1990 to 8.8% in the year 2000. As a result, 60% of urban dwellers in developing countries have been victims of crime with victimization rate reaching 70% in Latin America and Africa (UN-Habitat, 2007).

Africa cities like Lagos, Cape Town and Nairobi account for a sizable proportion of crime in their countries. The growing amount of crime in these and other large cities has brought about security problems in many nations. In Nigeria, for instance, urban



security threats have increased over the years among others. The categories of crime committed in Nigeria are cross-border criminality, violent crime (Addo, 2006). These are further broken down into armed robbery and car snatching, ethnic and religious riots, cyber-crime as well as economic crime and corruption. The different crimes committed are found to have serious negative impacts on the urban residents and the nation as a whole. The negative effects of crime includes; (i) injury and death, (ii) loss of vulnerable properties, (iii) anxiety and psychological stress, (iv) living in perpetual fear, (v) low productivity, (vi) impediments to foreign investment and capital flight, (vii) migration and brain drain and (viii) stigmatization of neighbourhoods or sections of the city. The diverse influences of urban security problems have some implications such as functionality and sustainability on the cities. It is important to checkmate the increasing rate of crime in the cities to ensure the proper functioning of the cities. To effectively control crime, however, the nature and character of crime must be understood and well dimensioned (Morenikeji et al., 2008).

The terms such as "terrorism" and "anti-terrorism" have been thrust into modern vocabulary of security following Post-September 2011 terrorist attacks on the United States (Bachmann & Gunneriusson, 2014). A conservative political agenda that has fuelled attempts to blur the boundaries between dissent or even crimes of property. Moreover, what the state defines as acts of terrorism, particularly when these involve progressive movements (Stevenson, 2011). Violence impedes the human freedom to the safety of lives and properties, and can sustain poverty traps in many communities. A key challenge for academics, policymakers and practitioners working broadly in programmes aimed at poverty alleviation, including violence