

ASSESSMENT OF THE APPLICATION OF CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED) IN RESIDENTIAL ESTATES IN MINNA

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Architecture right from the design of a simple building to the planning of an entire neighborhood can limit the opportunities for committing crime. Throughout the world, preventing crime has become a priority of citizens and government officials and thus all avenues including Crime Prevention through Environmental Design (CPTED) are being explored towards the reduction and fear of crime. Each community however, has its peculiar crime and thus requires an individualist approach towards the use of CPTED. More also is that limited study exists in the use of CPTED in the prevention of crime which has been on the rise in urban residential estates such as Minna, the capital of Niger state. This paper therefore assessed the extent of the application of CPTED in residential housing Estates in Minna, Niger State using the four features the Oscar Newman's 1973 principles of crime prevention. Data on the CPTED variables were collected via field observation conducted on housing estates in Minna. The descriptive statistics function of the SPSS was used to analyse the data collected, as well as showcase the pattern of CPTED in the housing estate. The findings of the research revealed some CPTED deficiencies such as lack of vehicular access control points (VACPs); hindered street surveillance due to high block-wall fencing practices and undulating vegetative cover; uncontrolled multiple entrance and exit points and improper environmental maintenance practices especially of the old buildings. This paper therefore recommends the adoption of some design features that can lead to a secured housing estate in Minna, and that this type of study should be carried out in other urban centers towards the reduction of crime.

Keywords - CPTED, Crime, Environment, Minna, Residential building, Security.

INTRODUCTION

Many urban centres have become vulnerable to criminal activities due to interplay of population explosion, rapid urbanization, globalization, environmental degradation. Quite often, social conflicts and anonymity, challenges the security of these areas, resulting in crime. (Banerji & Ekka, 2016). Hence over the years, urban centres have witnessed a high and increasing rate of crime and violence in both small and large settlements. Global statistics derived from surveys carried out by the United Nations indicate that crime increased steadily in the 1980-2000 period, rising from 2,300 to over 3000 crimes per 100,000 inhabitants (about 30% increase).

Reza et al. (2001) posited that the highest crime rates are found in developing countries, especially in Sub-Saharan Africa, Latin America and the Caribbean. These areas are acknowledged to have many crime risk factors such as high rate of urbanization, poverty, young and unemployed population, which promote the incidence of violent crime (Jinadu *et al.*, 2012). Thus, the WHO (2004) estimated that 90% of violence related deaths in year 2000 occurred in low and middle income with violent deaths rates of 32.1% per 100,000 people. It is against this backdrop that the protection of urban centres has for long times engage the attention of individuals, corporate bodies and government in most countries of the world, of which Nigeria is not an exception.

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As Architecture and technology evolved, building design addressed a host of other threats besides inclement weather and predators. Some of these arose from natural causes, while others were caused by human actions. The distinction between these threat types is important and worth repeating: Safety threats arise from natural or accidental conditions, whereas security threats result from actions planned and carried out by people. Thus, all avenues including Crime Prevention through Environmental Design (CPTED) are being explored towards the reduction and fear of crime. This is because various studies have found that the built environment does influence criminal behaviour (Cozens, David, & Gwyn, 2001; Liebermann & Kruger, 2004; Merry, 1981). According to Nasar & Fisher (1993) the physical environment is more important than the social environment. This is because the physical environment covers design elements that can be revised through planning and design in order to reduce opportunities for the occurrence of crime.

The neighborhood as an entity of a wide range of inter-connected elements is subject to numerous potential threats to lives and properties. As highlighted by Gibson *et al.* (2002), they include; physical assaults, sexual harassments, burglary, vandalism, vehicle theft, house break-ins. Each community however, has its peculiar crime and thus requires an individualist approach towards the use of CPTED. Sadly, limited study exists in the use of CPTED in the prevention of crime which has been on the rise in urban residential estates such as Minna, the state capital of Niger state.

Crime Prevention through Environmental Design (CPTED)

Crime Prevention through Environmental Design (CPTED) is a most effective approach that reduces fear of crime, improves safety and enhances quality of life (Crowe, 2000). Lavy and Dixit (2010) stated that crime prevention through environmental design (CPTED) is an approach employed to provide protection to buildings and facilities and is centered on the concept of deterring crime and reducing fear of crime by thoughtful architecture and effective site design.

CPTED is of two (2) models namely; the Crowe/ Newman model and the Jeffery model. As of 2004, CPTED is popularly understood to refer strictly to the Newman/Crowe type models, with the Jeffery model treated more as multi-disciplinary approach to crime prevention which incorporates biology and psychology, a situation accepted even by Jeffery himself. (Robinson, 1996).

Principles of Newman/ Crowe models of Crime Prevention through Environmental Design (CPTED):

According to Oldroyd (2008), there are four basic principles:

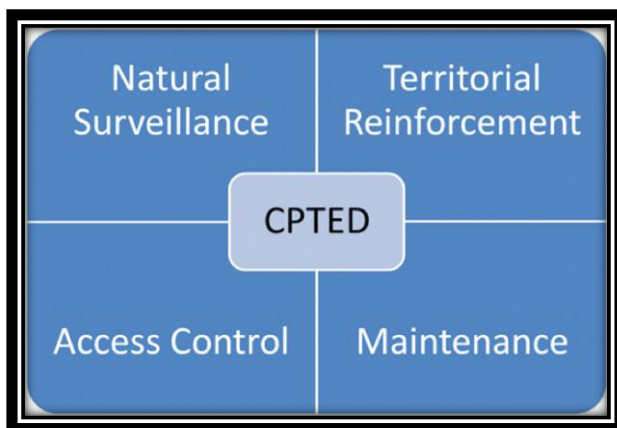


Figure 1.0: CPTED Principles Source: Google images (2017)

Territorial Reinforcement:

This involves the use of design to encourage proprietary behaviour among citizens, while at the same time creating an environment where the perceived probability of citizens' intervention is high. It is the strategy of using physical design to create a sphere of influence that can draw a clear delineation between private space and public spaces (Hanna *et al.*, 2015). The sense of ownership over this territory increases responsibility to overlook the space and keeps intruders away. Territoriality thus increases natural guardianship, natural congregation and natural defensibility (Taylor, et al., 1981). Property lines, landscape plantings, pavement designs, gateway treatments and fences are the devices that help draw boundaries.

Natural Access Control:

Natural access control limits the opportunity for crime by taking steps to clearly differentiate between public space and private space, by determining the location of entrances and exits, fencing, lighting and landscape to limit access or control flow, natural access control occurs.



Figure 2.0: Access controls Source: Google images (2017)

Natural Surveillance:

According to Hirsch, Finch, & Hankewycz (2004), this requires a design that provides a clear and unobtrusive view over critical areas through natural view, security devices and a capable guardian to monitor the operation of the security equipment. This is because of the fundamental premise that criminals do not wish to be observed. Therefore the placing of legitimate ‘eyes on the street’ increases the perceived risk to offenders, as well as increase the actual risk to offenders if those observing are willing to act when potentially threatening situations develop. So the primary aim of surveillance is not to keep intruders out but rather, to keep intruders under observation. Surveillance can be achieved by many techniques. The flow of activities can be channeled to put more people (observers) near a potential crime area. Windows, lighting and the removal of obstructions can be placed to improve sight lines from within buildings.

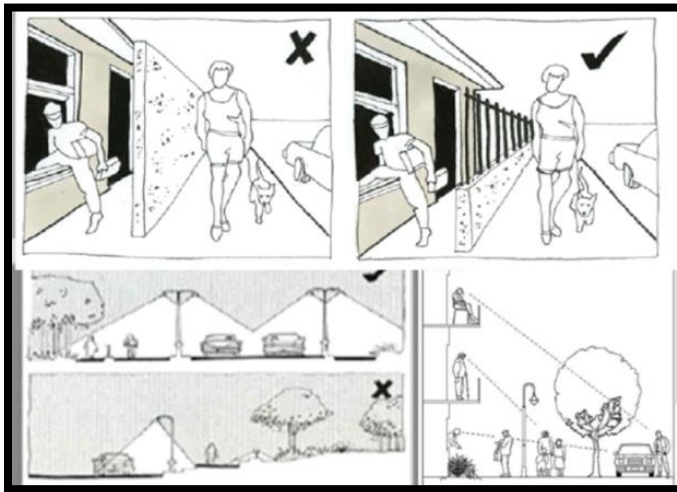


Figure 3.0: Solid and permeable fencing Source: Google images (2017)

Maintenance:

This involves regular cleaning and clearing of any obstructive objects that could impede visibility, with regular maintenance of building, its surrounding and its components.



Figure 4.0: Maintenance Source: Google images (2017)

METHODOLOGY

The research work leans on data collected through field observation conducted on housing estates in Minna. Sample frame of ten (10) residential estates was selected from the fifteen (15) available residential estates in Minna metropolis. Table 1.0 shows the list of residential estates visited. These residential estates were selected primarily due to the fact that they are located within the Minna metropolis which in itself is the study area. Descriptive statistics function of the SPSS was used to analyse the data collected, as well as showcase the pattern of CPTED in the housing estates. Pictures of some residential estates were also presented as plates to buttress further, the issues within the discussion of results.

Table 1.0: Names of residential estate visited

S/N	NAME
1	GEN. M.I. WUSHISHI HOUSING ESTATE
2	TALBA HOUSING ESTATE
3	CBN QUATERS
4	OLD-AIRPORT QUARTERS
5	INTERMEDIATE QUARTERS
6	TUNGA-LOWCOST
7	SENIOR QUATERS
8	SHEHU MUSA ESTATE
9	BOSSO LOWCOST
10	BOSSO ESTATE

Source: Author’s fieldwork, 2017

DISCUSSION OF RESULTS

Access control into the estates

From the observation taken, the amounts of vehicular access points as well as access control points were examined and the result is shown in figures 5.0 and 6.0. Observations analysis from the selected residential estates in Minna shows that 70% of the estates studied had four or more vehicular access roads while 20% and 10% had three and two respectively. Multiple access into a facility it makes it difficult to control security to an extent. Yet, having more than one entrance can ease evacuation. Vehicular Access Control Points (VACPs) however help in the limiting of unwanted access or exit. This too from figure 6.0 reveals that a higher number of estates (60%), lack this important feature and even some that have it present are often un-manned, hence rendering movement within the estates unchecked. Plate 1.0 and 2.0 show CBN quarters and Bosso estate, with a manned entrance access point and an unmanned VACP respectively.

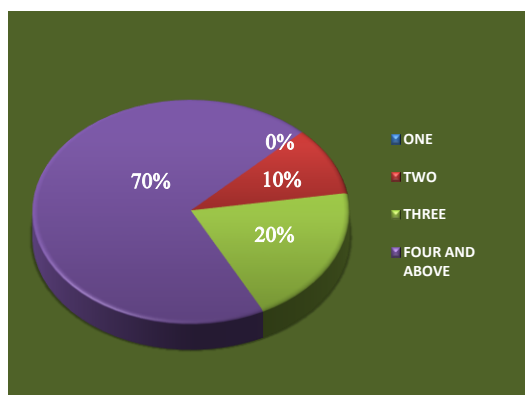


Figure 5.0: Number of vehicle-access roads into estate. Source: Author’s Field work (2017)

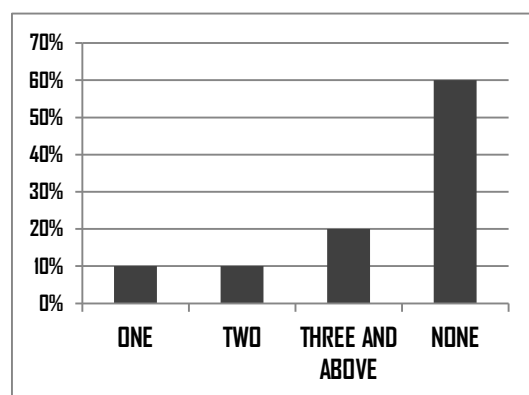


Figure 6.0: Number of vehicle-access control points. Source: Author’s Field work (2017)



Plate 1.0: CBN staff quarters
Source: Author's Field work (2017)



Plate 2.0: Bosso estate
Source: Author's Field work (2017)

The vegetative cover

Crime prevention can also be enhanced by ensuring that planting does not grow to obscure the view. Hence the vegetative cover within the residential estates was also examined regarding the types present as well as the heights and the results are shown in figure 7.0 and table 1.0 as well.

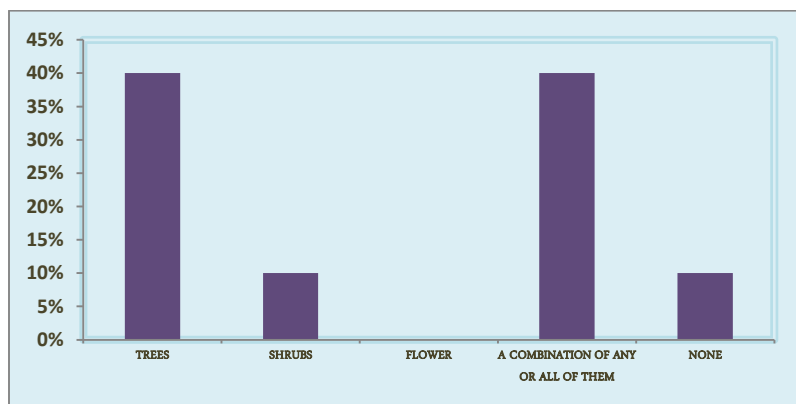


Figure 7.0: Existing vegetative cover. Source: Author's Field work (2017)

Table 2.0: Height of Vegetative Cover

S/NO.	ESTATES / TOTAL	HEIGHT OF VEGETATIVE COVER			
		<1m	1-3m	3-6m	>6m
1	M.I WUSHISHI HOUSING ESTATE			•	
2	TALBA HOUSING ESTATE				•
3	TAIBI QUARTERS			•	
4	BOSSO ESTATE		•		
5	OLD-AIRPORT QUARTERS				•
6	TUNGA-LOWCOST	•			
7	INTERMEDIATE QUARTERS			•	
8	G.R.A. MINNA				•
9	BOSSO LOWCOST			•	
10	CBN QUATERS			•	
11	TOTAL	10.0%	10.0%	60.0%	20.0%

Source: Author's Field work (2017)

Figure 4.0 shows that 80% of the estates sampled had either only trees or a combination of trees, shrubs, flowers or grass as landscaped element. Most however served as aesthetic elements only. Not as barriers to deter un-authorized access. Furthermore, from table 2.0, it can be seen that 60% of the residential estates had vegetative covers of which the heights fell between 3 to 6 metres. This means that some estates which had shrubs with heights falling in the 3 to 6 metres category had problems of blocked sight-lines. Also, those that had either the trees or shrubs falling in the 1 to 3 metres category had problems of interrupted sight-lines too. In addition, some estates had trees planted just by the fence, growing very taller than the fence, hence giving access to intruders into the houses via these trees.



Plate 3.0: Tunga low-cost



Plate 4.0: G.R.A



Plate 5.0: Bosso estate

Plate 3.0 and 4.0 shows Tunga low-cost and G.R.A, with tunga low-cost having a row of trees and a good sightline while G.R.A has an undulating sight-line. Plate 5.0 shows bosso estate, with trees planted just by the fence in a way that grants intruders access over the fence.

Fence design

Although high fences provide privacy, they restrict natural street surveillance of potential intruders. Fencing below 1metre in height, or open design fencing allows for adequate privacy and natural surveillance as well. In table 3.0, virtually all estates use block walls in fencing of individual dwelling units. Also, 90% of these fenced units have their fences spanning up to 3metres in height as seen in figure 9.0. They however do have security features which will aid in deterring climb-overs such as spikes and barbed wires as shown in figure 10.0. Thus, it shows that most dwelling units in residential estates in Minna are secluded from one another, giving criminals an edge of committing crime in one dwelling unit without necessarily been seen or caught.

Table 3.0: Type of fence around dwellings

TYPE OF FENCE AROUND DWELLINGS		
BLOCK WALL	PICKETS OR METAL POLES	VEGETATIVE LANDSCAPE
90.0%	0.0%	10.0%

Source: Author's Field work (2017)

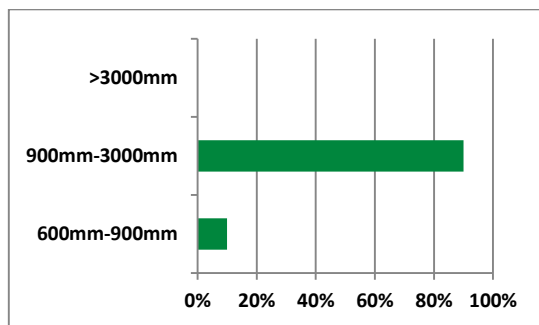


Figure 9.0: Height of fence around dwellings.
Source: Author's Field work (2017)

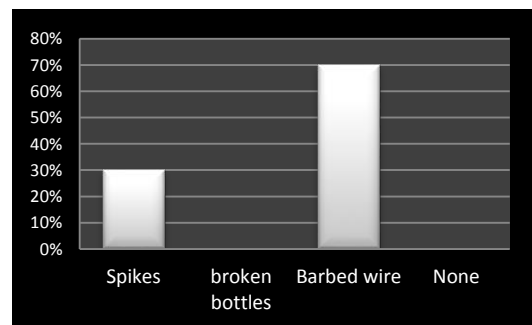


Figure 10.0: Security features on fence and gate.
Source: Author's Field work (2017)



Plate 6.0: Bosso estate
Source: Author's Field work (2017)



Plate 7.0: GRA
Source: Author's Field work (2017)



Plate 8.0: Use of open fencing
Source: Author's Field work (2017)

From plates 6.0, 7.0 and 8.0 above, some dwellings have their perimeter fences up to 3metres in height using block wall. However, plate 8.0 shows a well fenced dwelling which gives room for adequate natural surveillance using see-through fencing system of metal poles.

The use of security lighting

Lighting for security purposes helps prevent crimes which may be perpetrated most specially after work hours by distracting the criminals, enhancing physical security and other installed systems such as the CCTV. Both interior and exterior lighting are essential for effective security in building. Improved lighting is found to be extensively useful in boosting security. From figure 11.0, it is evident that, 50% of the estates examined had stand-by lighting systems, while others had none. Of those that had, most of the units were bad and the areas were mostly dark at night. This in turn gives an insight of the possibilities of crime perpetration to be very high.

Adequate lighting is essential in making people feel safe and in deterring illegitimate users of a space. It allows people to see what is ahead. Good lighting encourages legitimate users to use a facility after daylight hours. This in turn deters potential illegitimate users. Lighting therefore aids natural surveillance after daylight hours and facilitates formal surveillance (by police or security patrols).

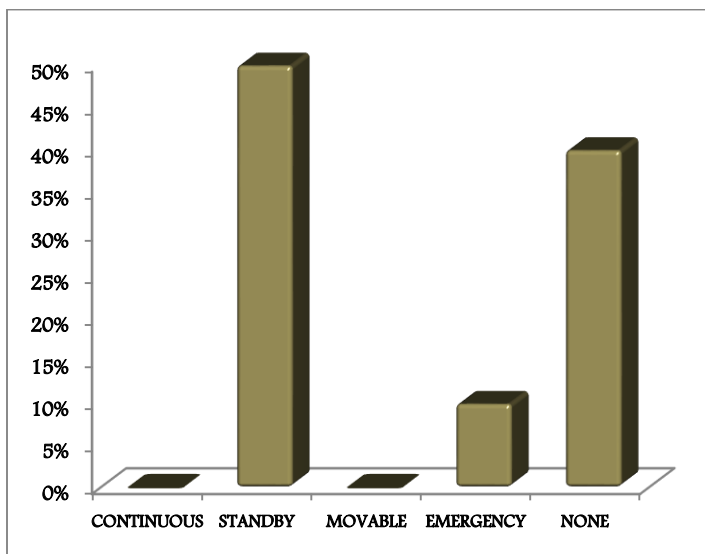


Figure 11.0 Type of security lighting available. Source: Author's Field work (2017)

The condition of building exterior and environment

The regular cleaning and clearing of any obstructive objects that could impede visibility, with regular maintenance of building, its surrounding and its components are very key to the deterrence of crime in an environment because a well-kept environment gives a cue of staying off a property because it is in regular use.

From figure 12.0, 50% of the dwelling units in the estates either had their paints fading/stained, or even peeling off/damaged. Some areas within these residential neighbourhoods are so unkept. They have grasses and shrubs growing wildly without proper culturing.

Plates 10.0 and 11.0 shows different residential neighbourhoods in an ill-kept manner with shrubs growing wildly in the children's playground in CBN staff quarters, as well as around a dwelling unit in Talba estate respectively. When areas are unkept as these above, it invites criminal activities to them instinctively, hence it should be avoided.



Plate 10.0: CBN staff quarters
Source: Author's Field work (2017)



Plate 11.0: Talba estate
Source: Author's Field work (2017)

CONCLUSION AND RECOMMENDATION

The standpoint that the physical environment affects criminal behaviour is an undisputable one as it covers elements that can be revised through planning and design in order to reduce opportunities for the occurrence of crime. As shown by this study, most residential estates in Minna have deficiencies in terms of crime prevention through environmental design (CPTED) such as; lack of vehicular access control points (VACPs); hindered street surveillance due to high block-wall fencing practices and undulating vegetative cover; uncontrolled multiple entrance and exit points and improper environmental maintenance practices especially of the old buildings. The problem as observed, may be associated with the fact that initial designs were made only to cater majorly only for inhabitation needs, with little attention being paid to security as demonstrated by the findings. Also, obsolescence was also observed as one major factor responsible for the vulnerabilities pointed out.

The paper therefore recommends various means of achieving a better secured residential neighbourhood through the adoption of the use of gated entrance access; use of only one access road leading into and out of the estate and establishment of access control points within the neighbourhoods intermittently at strategic points in order to check for unwanted movements within the neighbourhoods. Also, planting of vegetative cover which does not intercept a clear sight-line for surveillance within the neighbourhoods and the use of a see-through fencing system of metal poles will improve natural surveillance within the neighbourhoods. Finally, proper maintenance of standby lighting systems provided, as well as proper care and maintenance of the surrounding environment within the neighbourhoods should be encouraged as inattention and signs of physical despair often encourage further mishap around such surroundings.

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