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PROF. E. AHMET

TECHNICAL EDITOR
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ASSESSMENT OF SECURITY MEASURES IN THE DESIGN OF A PUBLIC SCHOOL IN KASTINA STATE, NIGERIA.

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ABSTRACT

Over the years there have been a global increase in terrorist attacks, the last few years, Nigeria as a country has had its own fair share of terrorism attacks, ranging from kidnapping to terrorist attacks and most of these attacks are carried out by terrorists forcing their way through unsecured public buildings, we conclude that the effect of these attacks especially bomb blast attacks on buildings affects the overall safety of building occupants and other important structures. It is therefore become a matter to take seriously. This recent wave of abductions follows other notorious incidents of mass abduction and murder of students, most prominently the cases of the Chibok and Dapchi girls. We should take all aspects and consideration to increase the architectural and structural resistance by advanced methods of designing, advanced materials and different security procedure of implication. It is mainly because of these are manmade disasters that's why it's an exceptional case. Furthermore it is discovered that most public buildings mostly in the northern part of the country are not designed with some innovative security measures as to be adopted in such structures to safeguard it. Hence the need for proper security measure in public buildings through the use of crime prevention through environment control (CPTED) cannot be overemphasized, therefore this research is embarked upon exploring different measures through crime prevention can be actualized in public buildings through the use of crime prevention through environmental control, so as to reduce or counter terrorists' attacks in public schools in northern part of the country, we will be adopting qualitative research approach, which entails participating, observing and also conducting interviews, the results of the findings will be incorporated as a serious measure in public schools to enhance security against terrorism in public structures.

Keywords: Innovative, Environmental, Terrorist, Kidnapping, Terrorism.

INTRODUCTION

The concept of security is an all-encompassing condition in which people and communities live in freedom, safety and peace, and generally participate fully in the administration of their nation, enjoy the protection of fundamental rights, have access to resources and basic necessities of life, and inhabit an environment which is not detrimental to their health and well-being. This description revealed that security embraces all aspect of societal prospects and human endeavors geared towards promoting freedom and safety of people and their properties. In this sense, the focus on people, their values and properties are aspects of security that specifically deal with the issues of personal and physical security. Kidnapping in secondary schools has increased in recent times, School as a social organization is singled out for attacks by terrorists worldwide, we have examples like in 1874 around 17th century as child abduction in Britain when the kids of the rich families were been abducted for “ransom while asleep (nap)” Tzanelli et al., (2019), and also Nigeria in recent times especially in the north-west region of the country there are over five hundred reported cases of students adoption by bandits, most times attacks are indicative of “targeted violence” aimed at educational institutions, most times by rebel or terrorist groups with a view to sending strong messages to the state authorities (Mohammed et al., 2016). According to Applebury (2018), providing proper school security and keeping schools safe allows children to look forward to being in an encouraging environment that promotes social and creative learning. When their basic safety needs aren't met, children are at risk for not feeling comfortable at school and may stop showing up, or they may remain on edge throughout the day. Promoting school safety creates an open space for kids to explore, learn and grow. The case of the Chibok girls, the abducted Dapchi girls, the 300 students from the Government Girls Science Secondary School in Jangebe, Zamfara state and the more recent on case of the abduction of school children in the kagara district of Niger by an armed gang who stormed the government secondary school this is an indicator that points to the fact that other states are also encountering the same security challenges.

LITERATURE REVIEW

Nunes-Vaz, *et al.* (2011) describe security measures or controls as a physical, psychological, procedural, electronic, or other structure that executes or contributes to one or more security functions by dividing physical space into zones. Most safety and detection measures, according to the entire building design guide (WBDG), have to do with a balance of organizational, mechanical, and physical safety approaches. A primarily operational approach, for example, would emphasize the round-the-clock deployment of guards; a primarily electronic approach would emphasize video monitoring and warning sirens; and a primarily physical approach would emphasize closed doors and vehicle barriers to secure a given facility from unwelcome intruders. It is critical to implement certain specific security measures

outside and inside the facility in order to minimize danger. Trees, thick plantings, heavy structures such as huge sculptural objects, giant boulders, and concrete shapes could be used as defence precautions.

Passive measures for a working protection infrastructure, according to the National Capital Planning Commission (2002), are a permanent protective function provided by both the location and the structure that necessitates the effective application of architecture and engineering to increase protection by removing potential threats. According to Randall (2003), protective precautions can be addressed using words like perimeter and exterior security, entrance security, interior security, security preparation, and crime reduction by urban design (CPTED).

ZONING FOR SECURITY

An application of zoning concept simply entails a proper control of human movement in terms of security. The main idea behind zoning is to allow for visitors, vendors, and others to reach their respective destinations or points without any hindrance and simultaneously prevent them from entering areas where they have no business (Randall, 2003). This can go long way in reducing congestion and also helping in spotting unauthorized persons. According to Nunes-Vaz, *et al.*, (2011) Security layers around a sphere may be used to zone for defence, and these layers lead to the installation of a series of controls that can theoretically avoid or completely prevent the dangerous occurrence of a given incident. According to Droge *et al.*, (2004), a comprehensive site management scheme considers fundamental principles that determine the security requirement and protect against a range of threat scenarios. Zoning for security is achieved by site security (usage of certain vital elements and factors that helps to restrict space). This can be achieved through setbacks, physical barriers and perforation, and landscaping.

SETBACKS AS A SECURITY MEASURE

Terrorism attacks focus on explosive devices concealed in vehicles near target buildings in around 80% of cases. This is why many site security designs emphasize maintaining a minimal gap between the target building and possible bomb sites, such as a vehicle or a static feature on the premises. This is referred to as a "standoff" or "setback" gap. Setbacks, also called "standoff" zones, are specified distances between a "target" object, such as a house, and the nearest point of attack (Droge & Hopper, 2004).

ACCESS CONTROL FOR SECURITY

It is basically the various procedures for blocking, identifying, and/or searching individuals trying to obtain access to a building are known as access controls (Droge & Hopper, 2004). Designing for protection, according to Bulla (2004), is similar to peeling an onion: it is done layer by layer. Mechanical and electronic structures, operating protocols, and natural and

architectural features are used to create a sequence of overlapping layers of security defences. They provide the basic foundation of any effective defence infrastructure: deterrent, detection, and delay, as all of these functions together. At any of these layers, access control is a factor in ensuring security and safety. You will reduce the likelihood of crime by limiting entry. True barriers, such as fences, or symbolic barriers, such as low-growing landscaping trees, height changes, or even changing the texture of the sidewalk, can all be used. People entering or exiting a room are driven by the location of doors, exits, walls, landscaping, and lighting. The attractiveness of a low Hawthorn hedge does not compensate for the debilitating punctures caused by its thorns. As a result, it's a perfect alternative to unsightly barbed wire fencing. Stop trees and shrubs that could serve as scaling aids for the deck or higher story windows (Bulla, 2004).

CRIME PREVENTION THROUGH ENVIRONMENTAL CONTROL (CPTED)

Crime prevention through environmental control (CPTED) can be described as a multidisciplinary approach towards designing for security (Randall, 2013). It involves designing the built environment in such a way that it reduces the fear of, and opportunity for, disorder and crime. Natural surveillance, natural access control, territorial reinforcement, and maintenance are the four components of CPTED. According to Cozens, (2015) a critical look into CPTED can bring into focus the realization of seven key concepts; territoriality, surveillance, image management, activity support, access control, target hardening, and geographical juxtaposition. Droge and Hopper (2004) According to the author, nonviolent crimes like burglary can be deterred by providing adequate illumination, monitoring, and visual access to the location, The CPTED principles are a great collection of tools for preventing antisocial behavior and encouraging community ownership of public spaces. It also gives the impression that outdoor space planners and architects have some control over the final group of potential risks and violent crime. Many of these risks occur outside the building, where site protection architecture principles will prevent and/or mitigate harm while also allowing for the creation of high-quality public spaces.

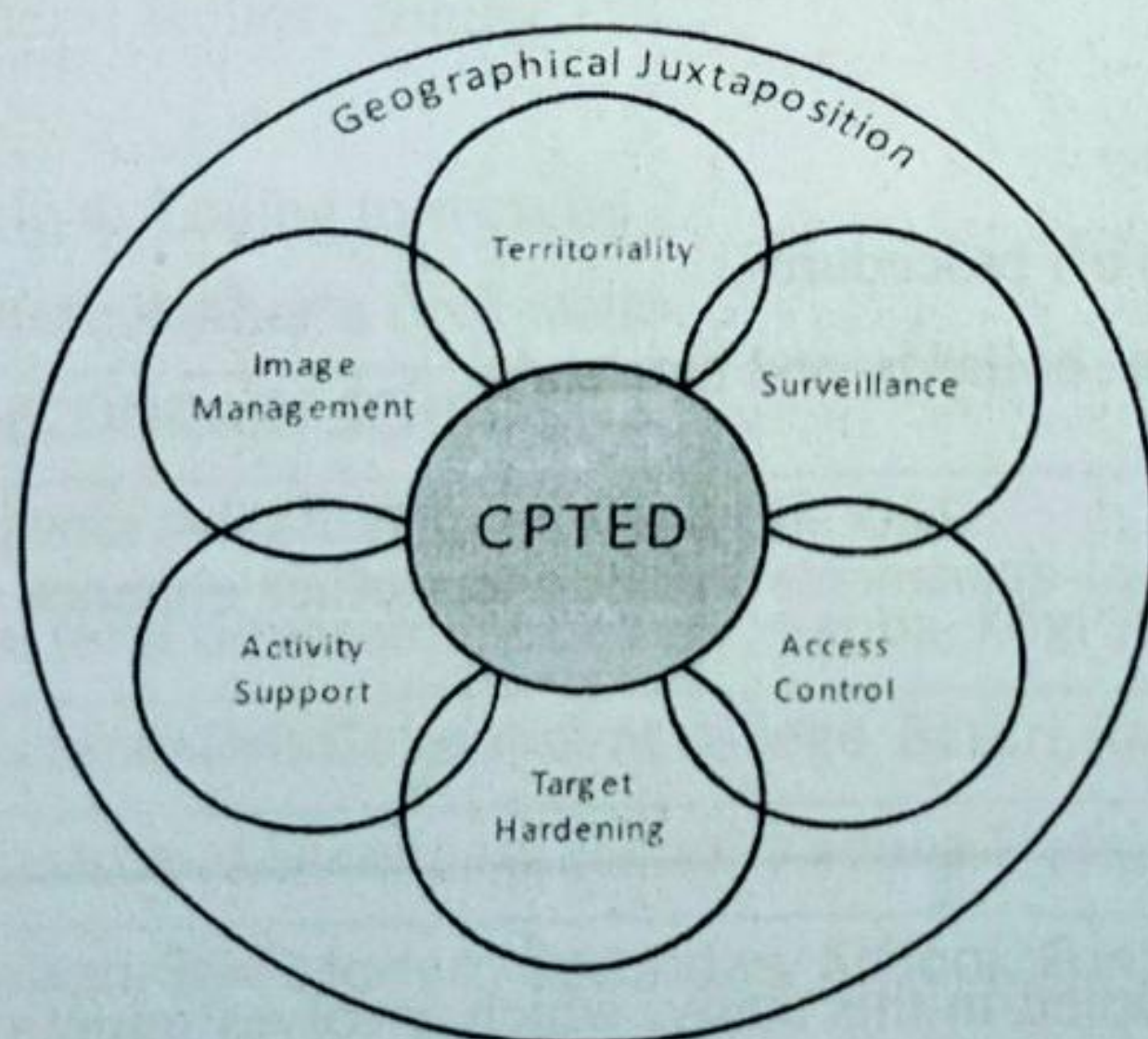


Figure 1: Showing the different f (CPTED) Techniques

Source: Zahner, (2017)

PASSIVE SECURITY MEASURES.

This involves space planning, landscaping, lighting to achieve a functional and safe environment and the use of all such design related components not needing mechanical operations. This is a design feature that deters threats and still remains largely invisible to its users.

These can be achieved by the use of high fences, barb wires, and bollards, directing traffic using curbs, multiple layers of protection, distant parking and buffer creation. This type of security measure is economical, most effective and permanent of all protective security measures of building structures, content and its occupants through adequate planning from conceptualization of the design. Passive security measure also integrates functionality into the environment components and furniture without conflict as the architect thinks along with such plans in his preliminary sketch design aside securing the intended properties, its components and furniture.

METHODOLOGY

Research Method

To meet the objectives as stated in the chapter one of this research, this work adopts a descriptive research method. A descriptive research method simply involves observing and describing the nature and behavior of a subject mostly accompanied with an observation or survey tool. Sufficient data was collected and analyzed to serve as guidelines throughout the research, for better understanding of this project. Different research methods were employed to gain important and more information about the whole design. Descriptive Survey method was employed for compiling data for this research work. This implies examining and recording a situation as it is.

Table 1. Checklist for observation and assessing sampled market

Source: Author's field work

S/No	Variables
1	Zoning for Security
2	Defined site boundary
3	Well established Drop off procedure
4	Use of Long stem trees, bollards, and barricade
5	Use of watch Towers
6	Designing of residential apartments in units to further enhance the defensible space theory
7	Gates and checkpoints

A non-random sampling techniques was adopted in this study, which involves intentional selection of specific samples relevant to the subject of judgment. These samples were

selected to be subjected under observation by the researcher in line with the drafted observation schedule, in order to extract information relevant to the study. The following are listed samples (public secondary schools) selected to be observed as shown in table 2

Table 2: List of Sample Libraries.

Source: Author's field work

S/No	Sample / Location
1	Emma Willard School, Newyork, USA.
2	Federal Government College, Kabba, Kogi State.
3	Federal Girls Government college, Batori, Kastina State.
4	Command Secondary School, Kaduna State.
5	Sabon Gar Modern Secondary School, Funtua Kastina state.
6	Zee Alpha International School, Funtua Kastina State.
7	Nigerian Tulip International School, Kaduna State.

DATA ANALYSIS

In this research, data gotten have been examined using qualitative data evaluation principles. The data acquired by the researcher using the observation guide was examined using the Microsoft office excel software, and the outcomes were presented using plates and figures.

ZONING TO SECURITY

The public schools observed showed that only (1) out of all the schools had and overall excellent security zoning, which took only 10% of the particular analysis, the private schools examined also had a fairly good security zoning and most public schools used had poor general security zoning.

Table 4: Zoning to security

Source: Author's field work

SECONDARY SCHOOLS	Poor	Good	Excellent
Emma Willard School, Newyork, USA.			?
Federal Government College, Kabba, Kogi State.	?		
Federal Girls Government college, Batori, Kastina State	?		
Command Secondary School, Kaduna State.		?	
Sabon Gari Modern Secondary School, Funtua Kastina state.	?		

Zee Alpha International School, Funtua Kastina State.		?	
Nigerian Tulip International School, Kaduna State.		?	

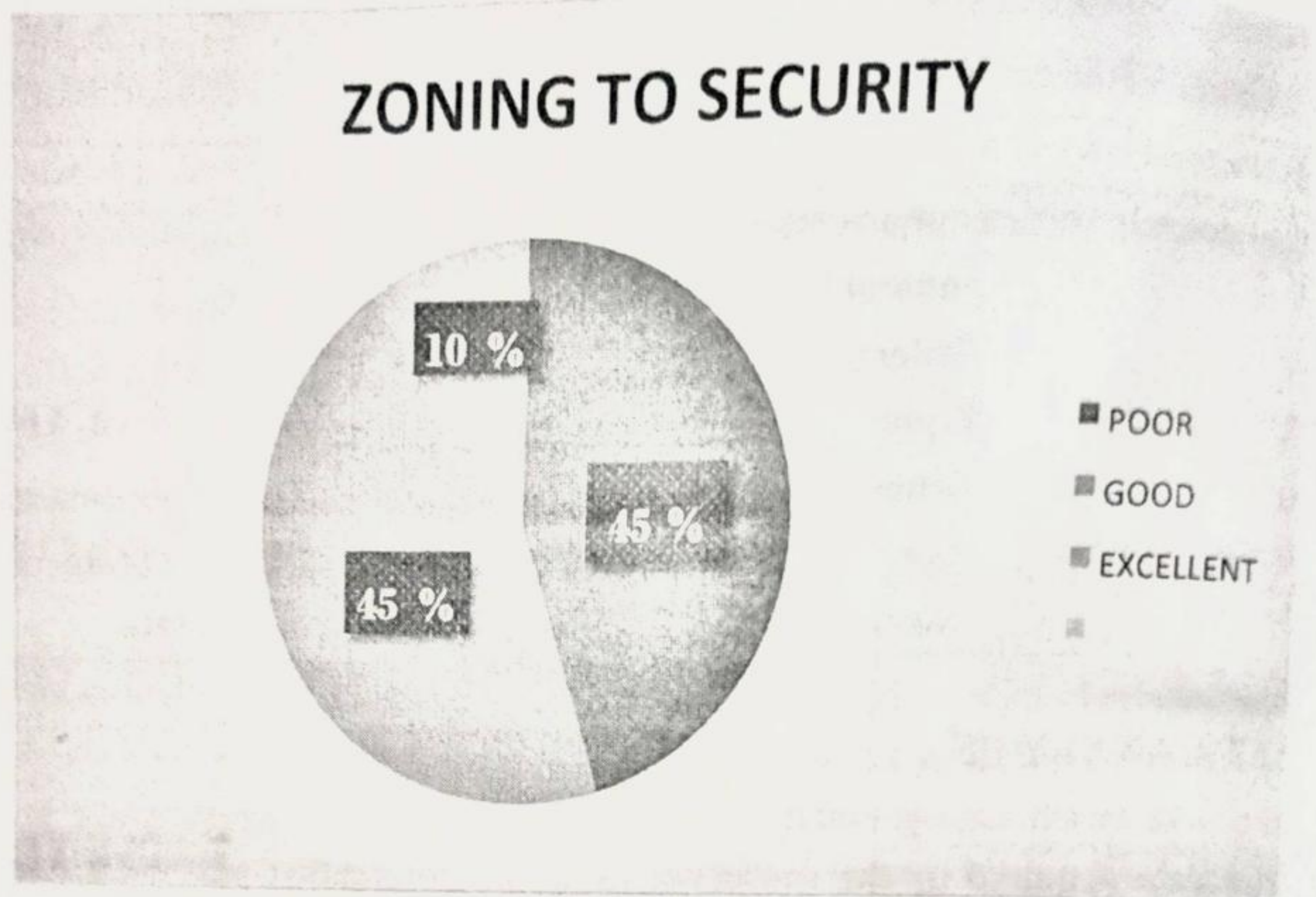


Fig 2: Percentage Distribution on Zoning to Security
Source: Author's field work

DEFINED SITE BOUNDARIES

Site boundaries are the defined landmass area covered or owned by the school that is properly fenced and marked for the school, the percentage distribution showed that most public school in the north had poor site boundaries demarcations only private case studies used had fairly good defined site boundaries.

Table 4: Defined site boundaries
Source: Author's field work

SECONDARY SCHOOLS	Poor	Good	Excellent
Emma Willard School, Newyork, USA.		?	
Federal Government College, Kabba, Kogi State.	?		
Federal Girls Government college, Batori, Kastina State	?		
Command Secondary School, Kaduna State.		?	
Sabon Gari Modern Secondary School, Funtua Kastina state.	?		

Zee Alpha International School, Funtua Kastina State.		?	
Nigerian Tulip International School, Kaduna State.		?	

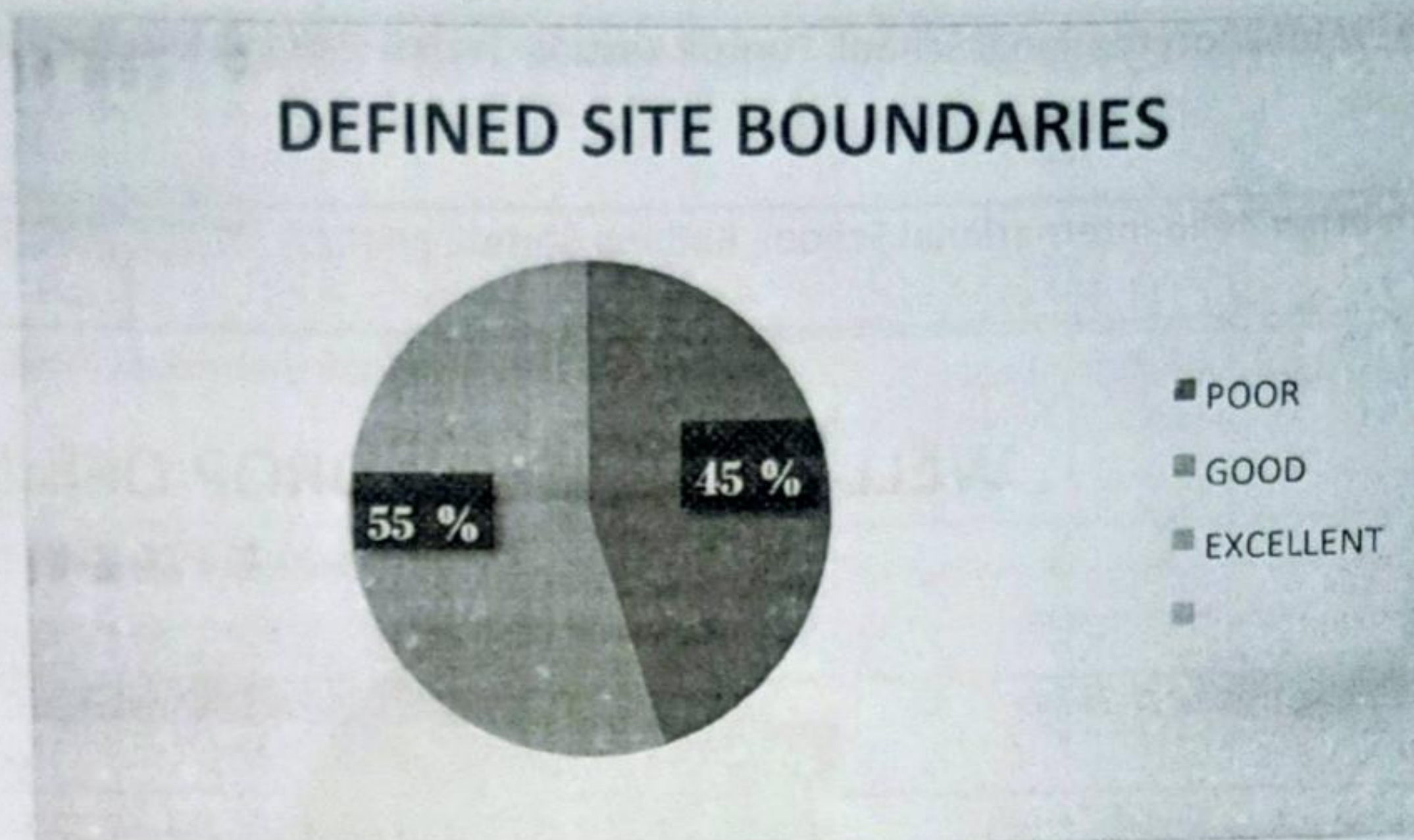


Fig 3: Percentage Distribution on Defined Site Boundaries
Source: Author's field work

WELL ESTABLISHED DROP OFF ZONE

Drop off zones refers to the defined zones for vehicular movements, car parks stations how defined they are in terms of security. The chart shows that most vehicular movements in and out of most of the schools are not closely monitored.

Table 5: Well established drop off zone
Source: Author's field work

SECONDARY SCHOOLS	Poor	Good	Excellent
Emma Willard School, Newyork, USA.			?
Federal Government College, Kabba, Kogi State.	?		
Federal Girls Government college, Batori, Kastina State	?		
Command Secondary School, Kaduna State.		?	

Sabon Gari Modern Secondary School, Funtua Kastina state.	?		
Zee Alpha International School, Funtua Kastina State.	?		
Nigerian Tulip International School, Kaduna State.	?		

WELL ESTABLISHED DROP OFF ZONES

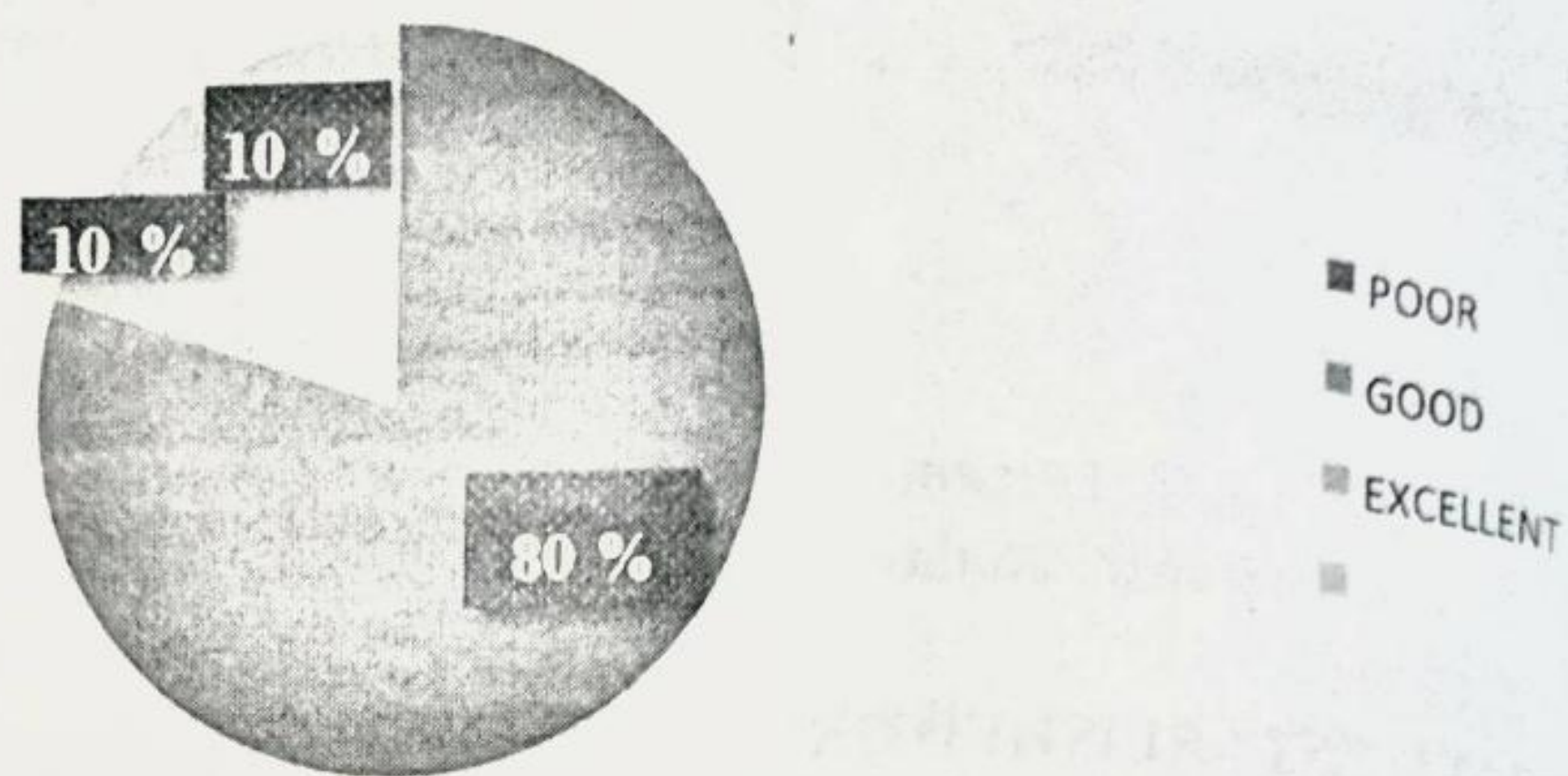


Fig 4: Percentage Distribution on Well-established Drop off Zones
Source: Author's field work

USE OF LONG TERM TREES, BOLLARDS AND BARRICADES

This involves the use of barricades which can either plants, bollards or any other devices as security guide in the various public schools. This chart shows the percentage of barricades distribution in the schools.

Table 6: use of long stem trees, bollards and barricades

Source: Author's field work

SECONDARY SCHOOLS	Poor	Good	Excellent
Emma Willard School, Newyork, USA.			?

Federal Government College, Kabba, Kogi State.	?		
Federal Girls Government college, Batori, Kastina State	?		
Command Secondary School, Kaduna State.			?
Sabon Gari Modern Secondary School, Funtua Kastina state.	?		
Zee Alpha International School, Funtua Kastina State.		?	
Nigerian Tulip International School, Kaduna State.		?	

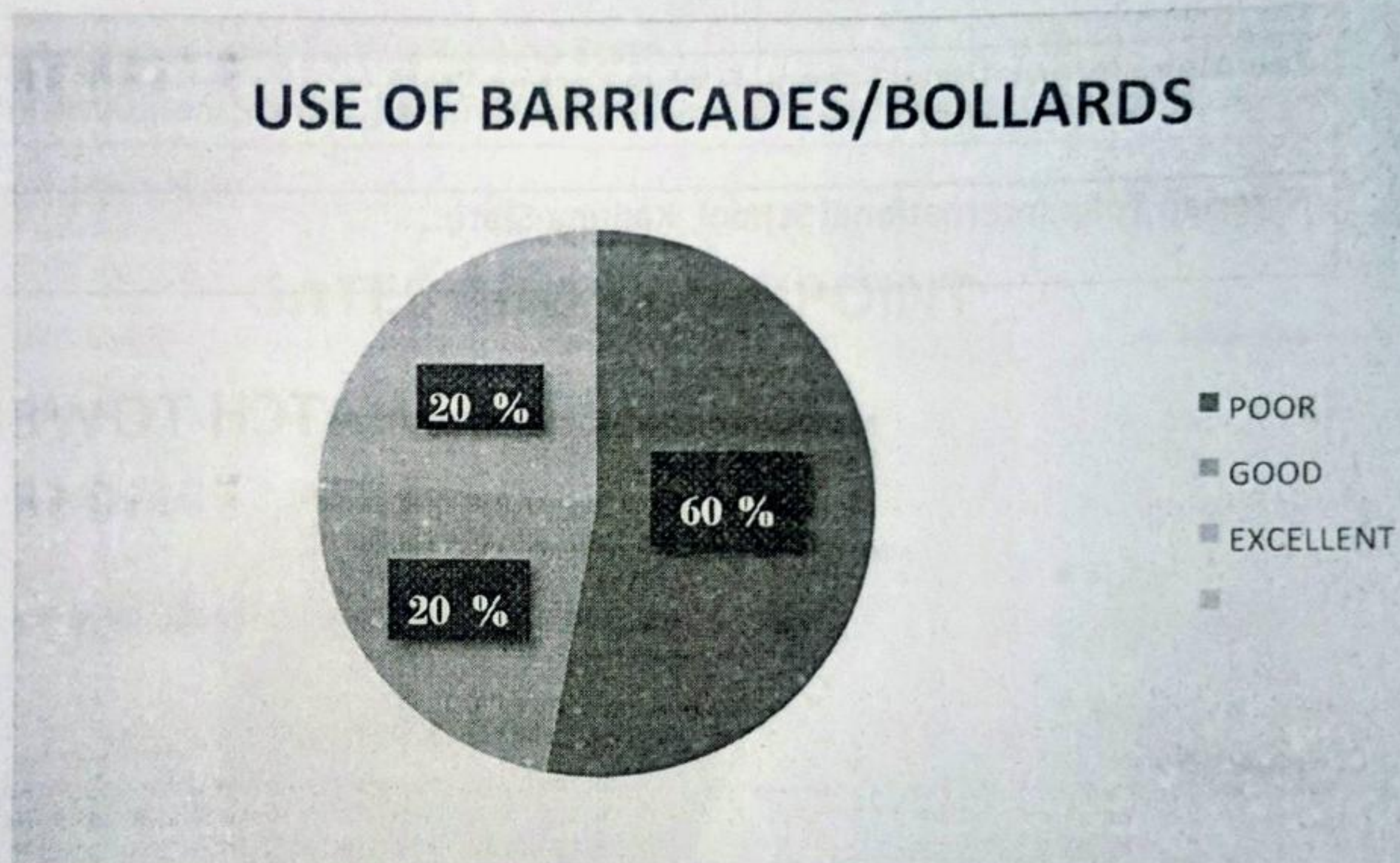


Fig 5: Percentage Distribution on use of barricades / Bollards
 Source: Author's field work

PRESENCE OF WATCH TOWERS.

The percentage of schools employing the use of watch tower is very poor. The chart shows the percentage of schools employing the use of watch towers.

Table 7: Presence of watch towers.

Source: Author's field work

SECONDARY SCHOOLS	YES	NO
Emma Willard School, Newyork, USA.	?	
Federal Government College, Kabba, Kogi State.		?
Federal Girls Government college, Batori, Kastina State		?
Command Secondary School, Kaduna State.	?	
Sabon Gari Modern Secondary School, Funtua Kastina state.		?
Zee Alpha International School, Funtua Kastina State.		?
Nigerian Tulip International School, Kaduna State.		?

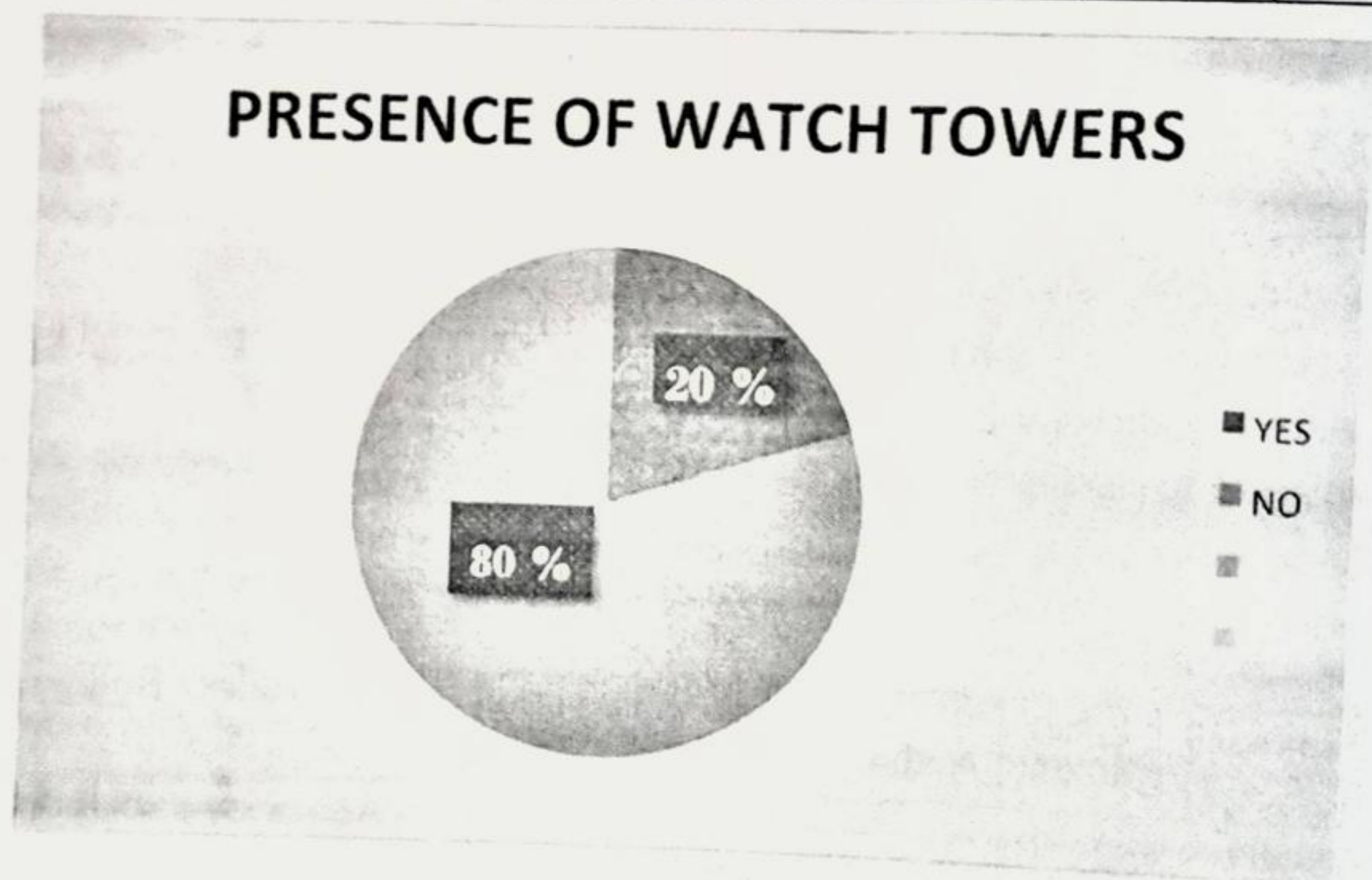


Fig 6: Percentage Distribution on use of Watch Towards.
Source: Author's field work

GATES AND CHECKPOINTS

This charts shows how the various checkpoints and gates in the school are ranked in terms of security of the various schools.

Table 9: Gates and Checkpoints

Source: Author's field work

SECONDARY SCHOOLS	Poor	Good	Excellent
Emma Willard School, Newyork, USA.			?
Federal Government College, Kabba, Kogi State.	?		
Federal Girls Government college, Batori, Kastina State	?		
Command Secondary School, Kaduna State.		?	
Sabon Gari Modern Secondary School, Funtua Kastina state.	?		
Zee Alpha International School, Funtua Kastina State.		?	
Nigerian Tulip International School, Kaduna State.		?	

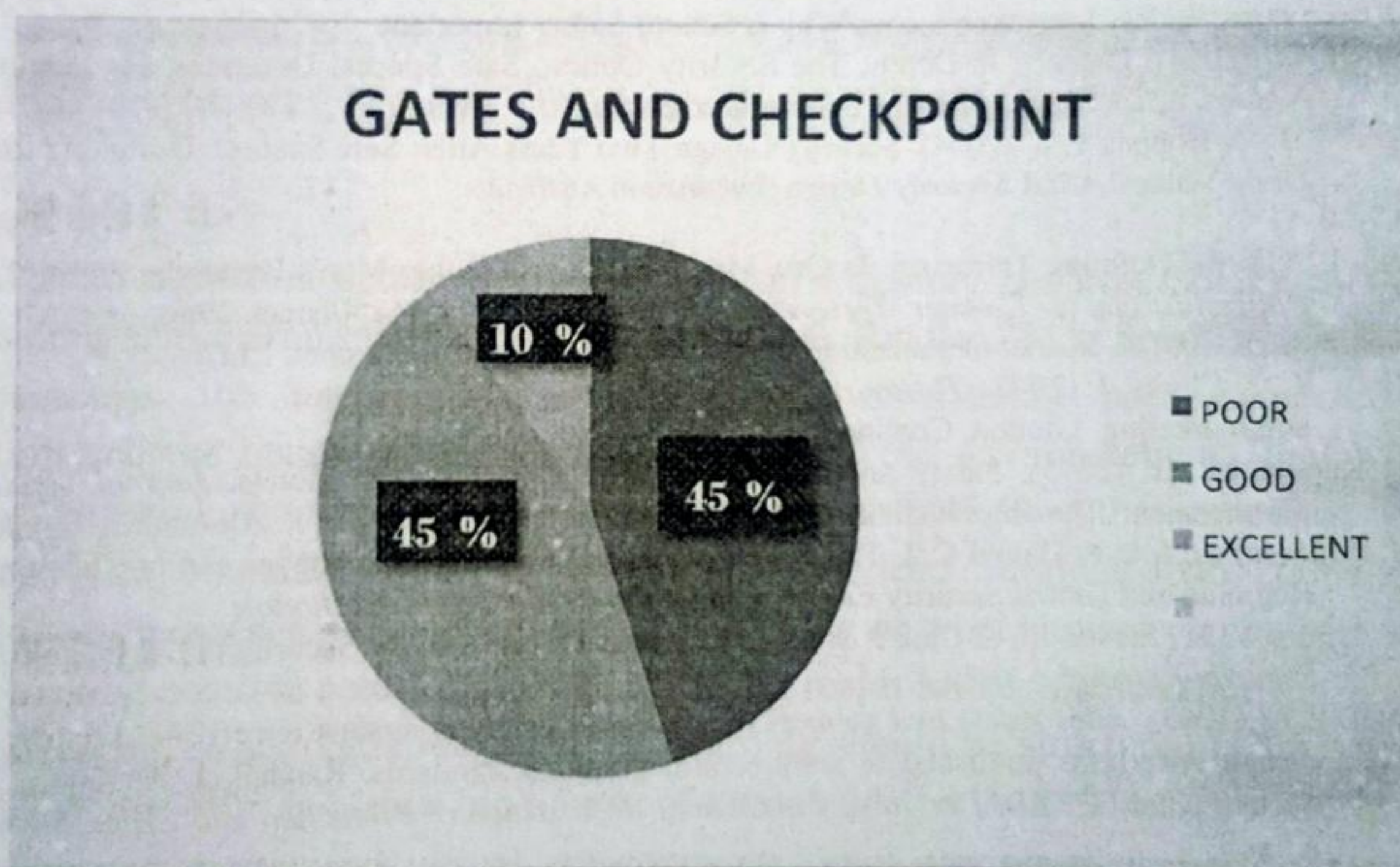


Fig 7: Percentage Distribution on Residential Zoning

Source: Author's field work

Summary of Analysis and Findings

From the evaluation and analysis carried out it is seen that most of the schools especially northern public schools in Nigeria lacks the necessarily security features to protect its occupants, and most of the school are not designed with security of the place in view thereby causing the school to be lacking in proper security managements of its environments.

CONCLUSION AND RECOMMENDATION

The study showed that most of the schools are plagued with security problem, as result of negligence in considering various vital factors of security that needs to be put in place to facilitate a well functional and secured public schooling environment.

Therefore this research recommends market designers and planner to consider without negligence various factors that facilitates proper and vital security managements in public schools in Nigeria.

Like proper defining of public school boundaries, siting the school in locations that are close to the main city, defined entry points, use of bollards, use of landscaping elements and also security checkpoints should be adopted to help fast track security in the schools

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