

**MAPPING AND MANAGEMENT OF CRIME HOT SPOTS IN ZARIA
METROPOLIS, KADUNA STATE NIGERIA**

BY

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(M.SC REMOTE SENSING AND GIS)**

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INFORMATION SYSTEM**

**DEPARTMENT OF GEOGRAPHY,
FACULTY OF SCIENCE
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AUGUST, 2016.

DECLARATION

I declare that this dissertation titled “Mapping and Management of Crime hotspots in Zaria Metropolis, Kaduna Nigeria” was conducted by me and has not been presented in the Department or anywhere for a degree. All quotations and sources of information are dully acknowledged by means of reference.

Dala Emmanuel

CERTIFICATION

This dissertation titled “Mapping and management of Crime hotspots in Zaria Metropolis, Kaduna State, Nigeria,” was conducted by Dala Emmanuel. The thesis meets the regulations governing the award of Master of Science Degree in Remote Sensing and Geographic Information System in Ahmadu Bello University, Zaria. The University approved for its contribution to knowledge and literature presentation.

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DEDICATION

Whole heartedly I devote this dissertation to God Almighty And to my parent late Mr/Mrs Dala Kwayams whose bequest has propelled me to this echelon may their souls rest in the bosom of our lord Jesus Christ Amen.

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I wish to express my gratitude to my amiable supervisors. In persons of Prof. I.J Musa and Dr. B.A Sawa for their priceless direction and counseling I received before, during and after the period of study. I highly appreciate their focused evaluation and advice.

I am grateful to all the authors whose works are quoted; I hope to pay back one day, by writing a book for students to quote as well. To my contemporaries, I sincerely appreciate them for their contributions academically, morally, socially, spiritually and financially. To my lecturers, I highly thank them for re- shaping my knowledge and character.

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ABSTRACT

This research is designed to map and manage crime hotspot in Zaria metropolis of Kaduna state, Nigeria. Despite several efforts towards curbing criminal activities, the menace continues to be a major concern in contemporary societies making people to live in uncertainties thereby hindering factors of growth and development by extension, scrippling economic activities in virtually all Nigerian communities. The aim of this study is to apply Geographic Information System (GIS) in mapping crime spots in Zaria metropolis and analyzing its spatial pattern with the view of making appropriate recommendations for effective management of crime was achieved through the following objectives: to identify and characterize the types of crime; create a spatial database for recorded crimes, to aid density analysis and determine crime hotspots and analyze factors responsible for crime growth within the study area. The data for the study were obtained through interview and field survey. The Nigerian Police Force, Zaria, Department of State Security Service (DSSS), 93 Intelligence Department Depot Nigerian Army Zaria, Local Chiefs and selected youths of some designated locations in Zaria provided vital data for this work. ArcGIS 10.1 was used in mapping spatial distribution of crime and Kernel density Estimation (KDE) was used to identify crime hotspots in Zaria metropolis. The results of the analysis show that, Crimes were very rampant in areas like Sabon Gari, PZ, Tudun Wada, Kusfa, Hayin Ojo and Hayin Dogo neighbourhoods. Other areas like Chikaji, Muchia and Kofar Doka are other crime prone areas with considerable number of cases reported. The buffer analysis reveals that neighbourhoods like Bomo Village, Hayin Dogo, Kabama, Unguwan Yusi and Nagoyi amongst others are out of coverage to accessing police facilities. The GIS query operations revealed that 43 crimes out of the total crimes recorded happens during the day while 76 crimes are committed at night. The research concluded that, virtually all types of crime occurred in Zaria metropolis and most crimes in Zaria are committed at night. Sabon Gari, PZ, Tudun wada, and Hayin Dogo are hotspots, consequently, Bomo Village, Hayin Dogo Palladan, Kabama, Unguwar Yusi, Hayin Ojo, Gaskiya and Tukur Tukur are located far away from police stations so need one each. The research recommends that, GIS as a tool for crime management should be made available to security operatives. training of relevant agents in crime mapping and management should be encourage to aid decision making process, once the law enforcement officers are taught spatial techniques of crime hotspots management, it will assist them in performing spatial analysis functions queries to display crime prone areas within their area of coverage in order to minimize use of available resources and mapower to abate crime.

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CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND TO THE STUDY

The word crime is derived from the Latin word '*root cernō*', meaning "I decide, I give judgment", typically referred to an intellectual mistake or an offense against the community, rather than a private or moral wrong (Linn, 2014) Crimes are human phenomena; therefore, their distribution across the landscape is not geographically random. For crimes to occur, offenders and their targets, the victims and/or property must for a period of time exist at the same location (Linn, 2014) Several factors, from the lure of potential targets to simple geographic convenience for an offender, influence where people choose to break the law. Similarly, the occurrence of crime is not random; it is spatially distributed in patterns. Some pattern is discovered while others are not. Factors such as social class, income level and environment play part in the types of crime that are committed. Resources and/or a lack of resources can influence the probability of crimes committed in any given area (Bridges, 1999).

This does not differ with situation in Zaria metropolis, as crimes have been increasing in the study area despite several efforts by Kaduna state government and Non Governmental Organisations (NGOs) to curb the menace. Criminals have continued to map out new strategies to commit crime in Zaria metropolis thereby causing fear and anxiety in the minds of citizens which affect virtually all aspects of socio-economic development of the people negatively.

Crime has various definitions depending on which angle one is looking at it from. For this research, the researcher considers it fit to work with the definition of crime as given by (Allen 2002,) who defined crime as the 'violation of law, or an instance of this, punishable by the state. Research seeking to explain the geographic variation in the rate

of crime has been ongoing for more than 100 years (Eck, Chainey, Cameron, Leitner and Wilson 2005). One of the teething social melodies that has permeated and plagued all societies of the world is the age-long monster called crime; African countries are not isolated from the contagion of criminal violence (Asamah, 2009). In that regard Egwu 2001 recorded that, youths of African cities make up at least 60% of urban population with less or no programme in these cities to address the challenges of unemployment, there by paving way(s) for severe cases of criminal activities.

Despite several efforts towards curbing criminal activities, the menace continues to be a major concern in contemporary societies. It's for this reason that, the International Crime Victim Survey (ICVS) painstakingly collected data from 55 countries spread over six major world regions including Africa, Asia, Central and Eastern Europe, Latin America and Western Europe. Findings showed that more than half of the urban respondents reported being victimized at least once regardless of what part of the world they inhabit as reported for the period between 1989 to 1996, recorded by (Ackerman and Murray, 2004).

In conjunction with this, analysts find it difficult to define crime hotspots making comparisons difficult both within and between jurisdictions. Making meaningful time-based analyses problematic, because crime hotspot definition criteria may not be used consistently over time. However, inter-jurisdictional and intra-jurisdictional variations in environments also make the application of absolute definition criteria tricky. Despite these challenges some authors have painstakingly defined hotspots in various ways. Generally, the hotspot concept is applied to street crime rather than white-collar crime, organized crime, or terrorist crime. That a few white-collar crimes might overwhelm street crime in their economic impact tends to be ignored. This may be because white-collar crime does not cause the same kind of community fear and anxiety as street crime. Similarly, if a city experienced several terrorist bombings or school shootings within 1

year, it is considered a hotspot that defies the normal hotspot definition. There is a qualitative aspect to hotspots; they refer only to limited crime types (Linn, 2014).

However, a great deal of confusion surrounds the hotspot issue, which includes distinction between spaces and places. Block and Block (1995) pointed out that a hotspot could be a point (such as a building or a classroom) or an area (such as a census tract or a metropolitan region). Be that as it may, there is currently no widely accepted definition of a hotspot. Indeed, a rigid, absolute definition may not be possible. Except for programs with procedures that self-define hotspots, meaning that, jurisdiction-specific procedures to define hotspots may make the most sense because they will fit local conditions. For example, hotspots are identified according to three criteria: frequency, geography, and time. At least two crimes of the same type must be present. The area is small, and the timeframe is a 1 to 2-week period. Hotspots are monitored by analysts until they become inactive (Canter, 1997).

Geographic Information System (GIS) as a tool for this study has been defined in various ways by different authors to suit their purpose(s). ESRI (2004) defined GIS as an information system and therefore described it as a system that is designed to work with data referenced by spatial or geographic coordinates. Clerk (1990) defined GIS as automated system for capture, storage, retrieval, and display of spatial data. In the same direction, GIS software helps to co-ordinate vast amount of location-based data from multiple sources. It enables the user to create layers for the data and view the data most critically to the particular issue or mission. For instance, Johnson (2000) stated that GIS helps crime officers determine potential crime sites by examining complex seemingly unrelated criteria and displaying them all in a graphical layer, spatial interface or map. It also helps them map inmate populations, fixtures, and equipment to provide for the safety

of inmates by separating gang members, identifying high-risk or potentially violent inmates, and identifying hazardous locations in an area. It reduces the potential for internal violence by providing better command and control. Geographic Information System can be used as an investigative methodology that uses the locations of a connected series of crimes to determine the most probable area of the residence of the offender. It can serve as the building block for several investigative strategies, including suspect and tip prioritization, address-based searches of police record systems, patrol saturation and surveillance, neighborhood canvasses and searches. GIS technology, by high-end spatial analysis and querying, highlights the crime location, and any physical boundaries that are present (that might not otherwise be noticed), and the types of roads and highways that come into both the abduction and body dump sites

Karthik (2004) said applications of GIS to crime mapping and management has been successful in many developed countries. Information associated with crime in Lima and Columbus (Ohio) was acquired and integrated in a GIS environment the analysis spanned crime from 1999 - 2004. The work informed policy and decision making in Lima Police Department, particularly with respect to community policing (Murray and Roncek, 2005).

Using GIS for crime mapping emanates from the ability of GIS to integrate different spatial data sets into a single analysis. Crime events displayed on their own rarely tell the whole story. Maps have the ability to display additional data sets that can enhance understanding of the crime layer such as the locations of taverns or bars etc. especially those features that are of paramount interest to the researcher. This drives the selection of supplemental data sets that will help the researcher to understand crime distributions found in the primary data sets. Therefore, an understanding of where and why crimes

occur can improve attempts to fight crime. Maps offer crime analysts graphic representations of such crime-related issues (Brantingham and Brantingham, 1981).

The global positioning system (GPS) as major tool for this study is an American military navigation system that uses a network of satellites to locate GPS receivers positioned anywhere on the Earth's surface. GPS receivers are lightweight, portable and cheap, its usage has become a key aspect of fieldwork to Researchers, Surveyors, Civil engineers, Town planners etc. Accurate ground control is essential when mapping using remotely sensed data, as remotely sensed measurements can only be as reliable as the ground truth on which they are based. In 2000 the USA improved the accuracy of standard GPS signals, from $\pm 100\text{m}$ to $\pm 10\text{m}$, greatly improving the ground-truthing of medium scale satellite imagery, such as the widely-used Landsat data. Differential GPS can now readily provide centimetre to metre detail in field survey locations: this has helped to improve the accuracy of mapping. Many GPS receivers are also data-loggers: you can devise a code system for a given set of features, use the GPS to locate those features, then plot and analyze the resulting features' locations by exporting the GPS data into a GIS environment (Kennedy, 2002).

1.2 STATEMENT OF THE RESEARCH PROBLEM

The existence of crime is as old as the creation of man himself and man has always looked for ways to combat and reduce it as much as possible. The occurrence of criminal activities in form of thefts, assaults, homicide, etc. is something that takes place every day in almost all reaches of the world. It is for this reason that, today crime analysis is gaining significance, and one of the popular subjects is crime mapping and management. Stakeholders in crime reduction are interested in forecasting the place, time, periodicity and types of crime in order to take precautions (Esra, 2007).

It is on the same lane that O'shea and Nicholls (2003) claimed that the goal of crime mapping is the unlocking of valuable insight from the collected crime information in order to assist law enforcement with apprehension and crime prevention, which would end up improving the overall quality of life of residents in certain community.

Murray, McGuffog, Western and Millins (2001) stated that a community with a high rate of criminal activities tends to deter both local and foreign investment and this is the present situation that prevails in the area under study. The Nigerian law enforcement agencies, especially Nigeria Police, whose responsibility is to maintain law and order, are not particularly effective in foreseeing where and when specific future crimes will take place because; they are handicapped of modern equipments like GIS and Remote Sensing to effectively perform their duties as expected of them.

It is however worthy to note that, the increasing rate of criminal activities has attracted the attention of researchers from various disciplines and human endeavours. The spatial pattern of crime as a matter of fact is of great importance because; the geographers' interest is on pattern of crime and determinant of its occurrence over space (Jerry, 2010). In the same vein, a number of researches have been conducted by sociologists, criminologists and geographers on crime. For instance, Akirinde (2007) contended that with no income coming in and no saving to fall back on, many retrenched people are said to have found themselves in a struggle for survival. Many that cannot find alternative jobs, but find means of livelihood decide to resort to crime.

Abdullahi (2000) has it that crime affects all members of society, regardless of sex, age and socio-economic background but is more evident in urban areas especially poor and marginalized neighbourhoods. Crime can take place in any location for example home, school, commercial establishment, public transport, sports and other public places. Fear

of crime changes the life of people. Concern about crime pushes wealthier population out of city centres segregating and creating fortified enclaves for home, leisure and work. Apart from the human suffering inflicted, crime acts as a stumbling block to development. If the sense of insecurity is all pervasive, cooperate investors, international development agencies and local artisans and merchants alike will be reluctant to participate in the activities that sustained economic progress. If security of lives and properties cannot be guaranteed, development and progress eludes such state or country.

Crime is a behaviour disorder that is an integrated result of social, economic and environmental factor (Esra, 2007). Today, crime mapping and management is gaining significance all over the world with emphasis on crime nature and pattern. Stakeholders in the crime reduction are interested in forecasting the place, time, periodicity of crime and types of crime in order to take precaution which is the focal point of this study. However, law enforcement agencies saddled with the responsibly of curbing the insecurity have not done much in terms of curbing the crime rate which has grown to epidemic level.

Zaria used to be the centre for textile industry for over 200 years has made elaborately hand-embroidered robes that were worn by men throughout Nigeria and West Africa. Gihring (1984). However, today reverse is the case because crimes and criminal activities have almost enveloped have crippled economic activities in the study area. The major problem that attracted the researcher's attention in the study area is fear and anxiety. The researcher observed that, in Zaria metropolis people live in fear and anxiety as a result of criminal activities. As such the the topic was conceived to find out how (Techniques adopted by the criminals to commit Crimes in Zaria), where (Location), when (Time), why (factors responsible for Crime in Zaria metropolis) to proffer possible solution for managing crime in the study area.

Moreso, despite several efforts towards curbing criminal activities, the menace continues to be a major concern in Zaria metropolis making people to live in uncertainties thereby hindering factors of growth and development by extention, scripling economic activities in virtually all Zaria communities and Nigeria at large.

However, from the crime related literature reviewed it was observed that, sociologist, criminologist, geographers have done justice to crime issues on their own perspectives. Vis: (Abdullahi 2000, Bridges 1999, Esra 2007, and Francis *et al* 2006) among others, focused on spatio-temporal analysis of crime, comparative crime analysis and mapping of crime. To the best of the researcher's knowledge none of these studies handled crime management aspect. In view of this, the researcher decided to fill that gab in knowledge by engaging in mapping and management of crime hotspots in Zaria metropolis as none of the available work has done so.

This research attempted to answer the following questions:

- i. What are the various types of crime that occur in Zaria Metropolis?s
- ii. At what time are these crimes committed?
- iii. Where are the crime spots and police stations in Zaria metropolis?
- iv. Where are the hotspots of crime in the study area?
- v. What factors enhance crime hotspots growth?

1.3 AIM AND OBJECTIVES

The aim of this study is to apply Geographic Information System (GIS) in mapping crime spots in Zaria metropolis and analyzing its spatial pattern with the view of making appropriate recommendations for effective management of crime.

The objectives of the study are:

- i. identify and characterize the types of crime in Zaria metropolis;

- ii. assess the time crime are committed in the area;
- iii. map out crime spots and buffer police stations in Zaria metropolis;
- iv. create a spatial database for recorded crimes in Zaria metropolis to aid density analysis and determine crime hotspots and
- v. analyze factors responsible for crime growth within the study area.

1.4 SCOPE OF THE STUDY

The purpose of this study is to apply Geographic Information System (GIS) in mapping and management of crime hotspots in Zaria metropolis from year 2011 to 2015. Spatial scope of the study was the five urban sectors namely Samaru, GRA, Sabon Gari, Tudun Wada and Zaria City served as geographic units in the analysis

1.5 JUSTIFICATION OF THE STUDY

The rapid increase in criminal activities has threatened human safety and sustainability of urban and rural areas in Nigeria. It is in this regard that the government, police and other security agencies in the country need to understand the crime pattern in areas of their operations or jurisdiction and determine crime hotspots in order to develop strategies and programme for crime prevention and control. The general public also need adequate knowledge on criminal activities and their mode of operation in their neighborhoods to enable them adopt the safety and management measures such as community policing, it would also assist the vigilante.

Information Technology plays a huge role in crime management, crime pattern analysis, density analysis and crime management. Geographic Information System has several applications in crime mapping and analysis and developed countries like USA, UK, France and Germany have heavily invested in it. GIS is used in police departments New

York Police Department (NYPD) and Los Angeles Police Department (LAPD) to analyze crime pattern and deduce information useful for patrol operations, strikes, crime prevention and how to utilize police resources.

In Nigeria especially in towns and cities, crime has greatly increased due to factors like poverty, unemployment and poor state of the economy. The present administration headed by Muhammadu Buhari has approved the recruitments of ICT professionals in the police force especially experts in the field of Geographic Information System. This shows the relevance of GIS in security operations, crime mapping, analysis and management.

The study will help to improve and extensively contribute to the existing knowledge on crime as it affects the general welfare of the public especially the inhabitants of the study area. Findings from the study will be of tremendous benefit to the policy makers, academia and students. Similarly, feedback about government policy on the crime and solution on management initiative, weakness and strength would be used to modify future techniques for reducing crime rate. More so the research will also pave way for other researchers to carry out more research project on crime and its challenges because the data derived from the study will serve as motivator for further studies on crime and other related issues.

CHAPTER TWO: CONCEPTUAL/THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 INTRODUCTION

This chapter applies various bodies of theories in social and behavioral science, predominantly emphasizing on Crime theory, Mapping theory, management approach and literature review. The geographical approach concerning time factor, spatial distribution and regional distribution are also used in the study.

2.2 CONCEPTUAL ISSUES

2.2.1 TYPES OF CRIME

According to (Linn, 2014) all crimes fit into one of the five categories. Although this research considered only 4 categories and types of crime with exception of white the crime. Because white collar crime does not cause the kind of fear and anxiety other crimes caused also is not a street crime as such can not be mapped (see table 2.1 for more clarity).

2.2.1.1 Violent Crime

Violent crime is categorized into known as:

- a. 1st Degree crime this is a situation an individual intentionally inflicts bodily harm and may result in a felony murder charge;
- b. 2nd Degree differs from 1st Degree in that, the perpetrators may use a potentially deadly weapon, but death neither resulted nor was it intended and
- c. 3rd Degree which is a misdemeanor, assault causing bodily injury. Homicide, domestic violence, hate crimes, and sexual abuse of an adult or a child all fall under the category of violent crime.

2.2.1.2 Property crime

Property Crime is defined as non-violent removal, without permission of someone else's property, usually for the financial benefit of the alleged thief. Common types of property crime include burglary or breaking and entering into a residence or business, and stealing property etc.

2.2.1.3 Public order crime

Public Order Crime as investigated by vice crime law enforcement include illegal gambling, drug use and abuse, pornography and prostitution. They are identified as victimless crimes because the alleged criminal has no intent to cause harm to any other person or take anything from any unless it is in trade. Vice or public order crimes fall under prosecutable law, but are also considered by the legal system to break laws of morality and are contrary to societal opinion about right and wrong.

2.2.1.4 Enterprise Crime

Enterprise Crime also Known as organized crime, involves a group(s) of people who have organized themselves into a crime-committing company of sorts. As the name implies, organized crime practitioners make a business of crime, and are cohesive and effective in their criminal practice. Relatively non-violent categories of enterprise crime include bribery, counterfeiting, illegal gambling, extortion, embezzlement, fraud, money laundering and stealing from trucks and trains

Table 2.1 Categories and types of crimes

Categories	Types
Violent crime	Homicide, domestic violence, aggravated battering, hate crimes, rape, and physical and sexual abuse
Property Crime	Burglary or breaking and entering into a residence or business, and stealing property; theft of items from a store or a person, (i.e. purse snatching and motor vehicle theft);
Public Order Crime.	Illegal gambling, drug use and abuse, pornography and prostitution.
Enterprise Crime	Bribery, counterfeiting, illegal gambling, extortion, embezzlement, fraud, money laundering and stealing. Also includes human trafficking, organized prostitution, exploitation of children, and murder-for-hire, kidnapping and other violent crimes

Source: Linn, 2014

2.2.3 Crime Mapping

Crime mapping is a sub-discipline of geography that works to answer the question, “What crime is happening where?” It focuses on mapping incidents, identifying hotspots where the most crime occurs and analyzing the spatial relationships of targets and these hotspots. Crime analysis once focused purely on the perpetrator and the victim, but did not take into account the location that the crime took place. In the last fifteen years, crime mapping has become more prevalent and uncovering patterns has become pertinent in solving crimes.

Crime mapping identifies not only where the actual crime took place, but also looks at where the perpetrator “lives, works, and plays” as well as where the victim “lives, works, and plays.” Crime analysis has identified that the majority of criminals tend to commit crimes within their comfort zones, and crime mapping is what allows police and investigators to see where that comfort zone might be. However, one of the most common

and innovative uses of crime mapping is to aggregate numerous crime events into hotspot maps. As explained earlier, aggregation to administrative units can run afoul of the MAUP: using different boundaries can result in significantly different maps. For much police operational work, this is not a problem for the user; police departments are often interested in the volume of crime in beats or districts, and city managers take interest in the crime level in city neighborhoods. Point-in-polygon aggregation, as can be conducted by any GIS, will easily complete this task.

However the MAUP does pose a significant barrier to accurate data interpretation for people wishing to study a problem in greater depth. Of considerable interest to researchers, and increasingly to more sophisticated crime prevention practitioners with a nuanced understanding of crime problems, is the use of techniques that do not force crime events to be the members of a group of fixed boundaries. Such techniques include spatial ellipses (Craglia et al. 2000), grid thematic mapping, and continuous surface maps using techniques such as kernel density estimation (Chainey and Ratchiffe, 2008) (this citation also serves as a useful quantitative evaluation of these techniques). These new approaches free the geographer from artificially constraining hotspot areas to comply with local areal boundaries, boundaries that often mean little to police, offenders or the community.

The resulting maps do ask more from the mapper as regards the selection of parameters especially “when little regard is given to the legend thresholds that are set that help the analyst decide when a cluster of crimes can be defined as a hotspot. This visual definition of a hotspot has being very much left to the ‘whims and fancies’ of the map designer” Eck, Chainey, Cameron, and Wilson (2005). As a result, some understanding of the underlying process to aid parameter selection is required.

2.2.3.1 Crime Mapping Principles

As stated above a map, like any other type of picture, is intended to be a representation of reality. Depending on the tools and data available, maps can be crude representations of reality or they can embody a tremendous amount of complexity and nuance. While maps can make the complex more comprehensible, the usefulness of any map depends on the skills, experiences, and knowledge of the mapmaker. More complex is not necessarily better. Like pictures, abstract maps sometimes portray information more clearly than complex maps. A well-designed map will worth a thousand words; a poorly designed map will confuse and misinform.

At a fundamental level, maps are a logical extension of the geometry and geography we all learned in elementary school. Broken down to elements, maps are carefully arranged composites of geometric objects. The most basic crime maps are nothing more than a series of points (dots representing locations of crime incidents or arrests), lines (depicting street networks), and polygons (demarking jurisdictional boundaries or precincts). Although the incorporation of aerial satellite images, called orthophotography, can give a crime map an air of sophistication, the photographic image is nothing more than a dense grid of colored squares, or pixels.

Maps have been used for centuries to display and explore the spatial and temporal organization of data. Their use in the display of crime data, however, is a much more recent development. For a discussion of the analyses done over the last 150 years on the relationship of crime and place, see Eck and Weisburd (1995). It has only been in the last dozen or so years that mapping of crime data has come into its own, with many police departments developing the ability to quickly and fairly easily generate their own maps. This can be attributed in large part to the increased sophistication of computers and the dramatic reduction in the price of the hardware and software necessary to create the maps.

The major benefit of the visual display of quantitative information (to borrow the title of Edward and Tufte (1983) is that it allows us to grasp the relationship of many points and types of data quickly. Since most crimes occur at a specific place, and since many similar crimes typically occur within a jurisdiction, a visual representation of crime's spatial distribution has obvious benefits for crime analysts, for policymakers, and for managers and administrators. As McEwen and Taxman (1995) put it, maps are of two basic types: descriptive, used to provide an Overview of the area in question and the various features within it; and analytical, used to aid in the analysis and interpretation of the features being displayed. McEwen and Faye (1995) also talk about interactive mapping, although this seems more like a melding of the two other techniques. Whatever their uses, full-colour maps can provide eye-catching displays that seemingly tell us a great deal of useful information. Maps can show locations of offenses, offenders, or victims. They can be used to demonstrate the mobility of offenders in finding suitable targets for their offenses, i.e., their "hunting patterns" (useful in the search for unknown offenders). Although they can be thought of simply as a way to display information, maps are important tools that can help in evaluating the effectiveness of strategic decision-making. For example, the implementation of an intensive enforcement policy in one jurisdiction may reduce crime at that site, but increase it at another. A graphic display of offenses over time could quickly and clearly indicate such displacement. By combining crime data with other information, maps can show areas (neighborhoods, towns, counties) with unusually high (or low) rates of offending in combination with demographic variables. Used in such ways, crime maps can indicate areas of social disorganization—areas where changes in social service delivery may have a positive effect on crime. In addition, by examining the social and economic makeup of a community, it might be possible to predict where increases in crime may occur.

The sociological literature is full of studies which have used “human ecology” to examine the influence of the physical environment on human behaviour. The work of Clifford and Henry (1969) in Shevky and Bell Los Angeles are two examples that come to mind, but there are literally dozens of studies done in America over the past 50 years. With few exceptions, however, the smallest geographic area examined was the census block group or its equivalent. One of the problems with mapping crime data has been the difficulty of processing data collected so as to make it mappable—and to do so in a time and consistent fashion.

2.2.3.2 Crime Typology Map

The crime typology map is a descriptive map that shows the point location of where various types of crimes were committed across the study area. This is the first analysis that was carried out in this research. Symbologies were used to annotate and represent the diverse crime activities. Crime typology map generated from crime data would clearly show predominant crime points/ types of crimes (Rape, Theft, Robbery, Aggravated Assault, Drug Related Crimes etc.) are mainly perpetuated. An Example of this case is household residence that suffered assault before been robbed (aggravated assault and robbery) and household residence that suffered assault and thereafter suffered aggravated assault and theft. This information were all collated and mapped.

2.2.4 Crime Management

Management is the process of directing and controlling the resources of an organization, such as its personnel, materials and equipments to achieve the goals of the organization. Crime management is therefore, defined as controlling, directing, and coordinating police and other security operatives’ resources (money, equipment and personnel) to prevent the

violation of law and where it has been violated, to apprehend the criminals and take them to court and recover the property.

The formal organized management of crime can be traced back to the mid 19th century in Britain advocated by Sir Robert (Musonda, 2000). From then on crime management has evolved in the early 20th century; a professional model for crime management was developed in the USA and diffused to other area of the world. The main operational goal of professional policing model was reactive to crime control. Law enforcement officers' do not seat in their offices and wait for complains from the public before they react to them; they closed to the public and communication was in one direction only, that is, from the top to the bottom (O'Shea, Nicholls, Archer, Hughes and Tatumz, 2003).

Crime scene Management starts from the time an officer arrives at the original call to investigate. The responding officer(s) determine the status of the scene. The police officer will secure the area and make information available to other responding police, fire and emergency personnel including Electro Magnetic Spectrum (EMS). It is the responsibility of all units arriving on scene to report to police officers before disturbing evidence. In the absence of notification fire and EMS should not assume the scene is in fact secure and take precautions to protect themselves and possible evidence from harm. Crime scenes are put into several classifications. Closed access to unsecured crime scene: This means the scene is a possible threat and hazards still exist. Hostages, suspect(s) still on scene or environmental hazards are present. Limited access crime scene: This means vital evidence could be destroyed. Possible evidence critical to the investigation must be protected; there may be some threat to personnel and /or environmental hazards present. Officers on scene will direct entrance and/or escort fire and EMS. Lifesaving consideration will take precedence and EMS will confirm death on obvious suicide/homicide. Open access crime

scene: Evidence still must be collected but all responders have access to the entire area. Care must still be taken not to disturb/ destroy or compromise evidence and must consult with officers before such action is taken.

The vision for Crime Management is aimed at improving the professional development of the Police and other security agencies and stakeholders, presenting strategies and teaching citizens about the effective management of crime in day-to-day activity. The idea is to enable security operatives to secure a mechanism for tackling contemporary insecurity challenges.

2.2.5 Crime Hotspots

There is very little information in the literature as to what a crime 'hotspot' is and how it is defined spatially and numerically. This lack of a readily available definition highlights the high margin for error when analyzing crime 'hotspots'. For example a study by Ratcliffe (2004) viewed Crime hotspots as areas that have high crime intensity. This area attracted researchers and analysts to examine geographic areas in relation to crime. Similarly researchers and theorists examine the occurrence of hotspots in certain areas and why they happen, in a nutshell these propelled analysts to examine the techniques used for developing maps that contain hotspots which is very critical and influential tool for policing, furthermore they help develop knowledge and understanding of different areas in a city and possibly highlight why crime occurs in some certain area.

Hotspot mapping is a popular method of crime forecasting, however there are a range of hotspot mapping techniques, and significant advantages and disadvantages of each. There have been several hotspot mapping comparison studies, however they have all failed to thoroughly evaluate techniques in order to find the optimum technique/s. Some studies, such as Jefferies (1999) and Chainey and Cameron (2002), focused on each technique's

ability to identify and visually display crime data. However, these studies have not quantitatively compared the techniques or identified an optimum technique for determining future crime patterns.

This lack of research into comparing the predictive ability of hotspot mapping led to Chainey and Ratchiffe (2008), which presented a comparison of four techniques by their prediction success. A dataset was used to form predictive hotspots and compared against a subsequent dataset to measure success. The study proposed a new Prediction Accuracy Index (PAI), their comparison measure found Kernel Density Estimation (KDE), to be the best performing tool. Despite praise for a comparison measure, the study itself attracted significant criticism. This focused upon the inequality of the technique comparisons because the quintile division of results does not allow the same statistical precision and therefore lacks standardization between techniques. Studies showed that (Pezzuchi, 2008). Criticize the choice of techniques with some well performing techniques like Nearest Neighbour Hierarchical (NNH) clustering, absent from the study (Levine 2004). However the most significant criticism was the surprising conclusion of KDE as the optimum technique as Levine (2008) explained, KDE is a smoothing algorithm that spreads higher values to adjacent cells and therefore creates larger hotspots which, if they do not collect proportionately more predicted crimes, should reduce the Prediction Accuracy Index(PAI) score.

2.3 THEORETICAL FRAMEWORK

2.3.1 Criminology Theories

Why do people commit crimes? From misdemeanors to violent felonies, some individuals step in to the criminal justice system and learn their lesson to never commit a crime again. Others unfortunately become repeat offenders with a never ending rap sheet.

Environment obviously plays a huge role but it is only one of many factors. The study of crime and why some people can't get away from it while others never have even a speeding ticket has been dissected for decades.

Particularly, the study of criminology targets why individuals commit crimes and why they behave in certain situations. By understanding why a person commits a crime, one can develop ways to control crime or rehabilitate the criminal. There are many theories in criminology. Some attribute crime to the individual; they believe that an individual weighs the pros and cons and makes a conscious choice whether or not to commit a crime. Others believe it is the community's responsibility to ensure that their citizens do not commit crime by offering them a safe and secure place in which to live. Some argue that some individuals have specific traits that will determine how they will react when put in certain negative conditions. Although varied in thought, everyone can agree that justice needs to be secured in a civilized society. (Wikipedia.org)

2.3.1.1 Choice Theory

Choice theory is the belief that individuals choose to commit a crime, looking at the opportunities before them, weighing the benefit versus the punishment, and deciding whether to proceed or not. This cost-benefit analysis primarily focuses on the idea that we all have the choice to proceed with our actions. Because of the punishment involved, we are deterred from committing the crime. (Wikipedia.org)

2.3.1.2 Classical Theory

Similar to the choice theory, this theory suggests that people think before they proceed with criminal actions; that when one commits a crime, it is because the individual decided

that it was advantageous to commit the crime. The individual commits the crime from his own free will being well aware of the punishment.

This theory, along with choice theory, derived its basis from what John Locke penned “The Social Contract.” Locke proposed that all citizens are equal, and that there is an unwritten but voluntary contract between the state and its citizens, giving power to those in government and defining a framework of mutual rights and duties. In *Leviathan*, Thomas Hobbes wrote, “the right of all sovereigns is derived from the consent of every one of those who are to be governed.” This way of thinking enforces the idea that we, as citizens, agree to follow the laws of the government in return for our protection and sustenance which is very different from early European authoritarianism. (Wikipedia.org)

2.3.1.3 Conflict Theory

On a different spin, conflict theory holds that crime results from the conflicts in society among the different social classes, and that laws actually arise from necessity as a result of conflict, rather than a general consensus. The fundamental causes of crime are the social and economic forces operating within society. The criminal justice system and criminal law are thought to be operating on behalf of rich and powerful social elites, with resulting policies aimed at controlling the poor. The criminal justice establishment aims at imposing standards of morality and good behavior created by the powerful on the whole of society. Focus is on separating the powerful from the have-nots who would steal from others and protecting themselves from physical attacks. In the process the legal rights of poor folks might be ignored. The middle class are also co-opted; they side with the elites rather the poor, thinking they might themselves rise to the top by supporting the status quo.

Thus, street crimes, even minor monetary ones are routinely punished quite severely, while large scale financial and business crimes are treated much more leniently. Theft of a television might receive a longer sentence than stealing millions through illegal business practices. (Wikipedia.org)

2.3.1.4 Critical Theory

Critical theory upholds the belief that a small few, the elite of the society, decide laws and the definition of crime; those who commit crimes disagree with the laws that were created to keep control of them.

Critical criminology sees crime as a product of oppression of workers, (particularly, the poorer sections) and less advantaged groups within society, such as women and ethnic minorities, are seen to be the most likely to suffer oppressive social relations based upon class division, sexism and racism. More simply, critical criminology may be defined as any criminological topic area that takes into account the contextual factors of crime or critiques topics covered in mainstream criminology. (Wikipedia.org)

2.3.1.5 Labeling Theory

Those who follow the labeling theory of criminology ascribe to the fact that an individual will become what he is labeled or what others expect him to become; the danger comes from calling a crime a crime and a criminal a criminal.

Labeling theory holds that deviance is not inherent to an act, but instead focuses on the tendency of majorities to negatively label minorities or those seen as deviant from standard cultural norms. The theory was prominent during the 1960s and 1970s, and some modified versions of the theory have developed and are still currently popular. Unwanted

descriptors or categorizations – including terms related to deviance, disability or diagnosis of a mental disorder – may be rejected on the basis that they are merely “labels”, often with attempts to adopt a more constructive language in its place. A stigma is defined as a powerfully negative label that changes a person’s self-concept and social identity. (Wikipedia.org)

Crime theories can be a useful guide for researchers and analyst, in regard to analyzing crime hotspots and factors that lead to Crime. There are many theories of crime that explain why crime occurs in certain places and not in others. Place theories look at crime at specific places, which can also be viewed as “points on a map.” Eck, Chainey, Cameron, and Wilson (2005). Another crime theory used in regard to crime hotspots is neighborhood theories. These theories view crime at a larger level, and in a larger viewing area. When viewing these types of areas, statistical information is typically used to determine hotspots. A widely used theory to explain crime is crime pattern theory. Crime pattern theory explains that crime is not random. Crime hotspots can help aid in determining spatial-temporal patterns. This theory allows making generalized statements about area hotspots, and hotspot areas can be predicted using crime pattern theory Brantingham and Brantingham, (1999). When creating hotspots, theories that can help explain their occurrence should be evaluated to determine underlying causes. This is the plat form the researcher stood on to facilitate this research.

Crime theories can be divided into those that seek to explain the development of criminal offenders, and those that seek to explain the development of criminal events. Theories on offenders have been dominant in the development of criminology (Clarke, 1980).

Most research on crime and crime prevention has been focused on why certain types of people commit crime and what we can do about them". It is only recently that serious

attention has begun to be paid to explaining crimes rather than the criminality of people involved in crime. Concern with place is very much central to this approach. While theories of crime and criminality are often seen as competing explanations of the crime problem, we think it useful to begin with the idea that offender and event explanations are complements to each other rather than competitors. Offenders may be highly motivated, but unless they create a crime event there is nothing to explain. Similarly, given a criminal act, the full etiology of the event must in some manner include an explanation of the offender. Offender theories should eventually tell us how people come to be criminal offenders, and the circumstances under which they desist from offending. Such theories may suggest crime prevention strategies that are focused on those individuals who are likely to become serious violent offenders, or high-rate offenders committing less serious crimes. However, to date theories about the development of criminality do not provide a solid basis for making such predictions, and there is little consensus as to what such a theory in the future would look like. Consequently, a preventive strategy based on offender theories is not near at hand. But even if we were to understand more about the development of criminality than we presently do, it is not clear whether all or even most offenders can be prevented from involvement in crime (Clarke and Weisburd, 1990). So even if the researcher had a good explanation for the development of offenders, the researcher needs good explanation for criminal events. Specifically, a theory that could tell us why certain targets are selected by offenders and why some targets are attractive and how can they be overcome. What type(s) of routine activities of offenders, victims and what have sometimes been termed guardians contribute to the likelihood of crime occurring in particular places? Though, a comprehensive crime event theory that would provide unambiguous answers to such questions is decades away, there is considerable consensus among criminologists who study crime events as to what such a theory should

look like. Moreover, there is growing evidence that event-prevention strategies can have a dramatic and immediate impact on specific crime problems (Clarke, 1992).

However, three recent theoretical perspectives-rational choice, routine activity theory and crime pattern theory-have influenced our understanding of the importance of place in crime prevention efforts. A rational choice perspective provides the basic rationale for defining place as important, since it suggests that offenders will select targets and define means to achieve their goals in a manner that can be explained (Cornish and Clarke, 1986). Some claim that this perspective is to some degree untestable, as it is almost always possible to interpret behaviour as rational from the perspective of the offender (Parsons, 1951). Others have demonstrated that it is possible to test various forms of rational choice (Hogarth and Reder, 1981). Nevertheless, a rational choice perspective can be used to develop testable propositions describing crime events and offender behavior. This is particularly true if a rational choice perspective is used in conjunction with routine activity theory (Clarke and Felson, 1993). Routine activity theory seeks to explain the occurrence of crime events as the confluence of several circumstances Cohen and Felson, (1979). First, there must be a motivated offender. The explanation of the development of motivated offenders is the goal of offender theories. Second, there must be a desirable target. Third, the target and the offender must be at the same place at the same time. Finally, three other types of controllers—intimate handlers, guardians and place managers-must be absent or ineffective. Intimate handlers are people who have direct personal influence over an offender (such as parents, teachers, coaches, friends or employers).

In the presence of such people, potential offenders do not commit crimes. Most adults are away from intimate handlers for many hours of the day and many offenders, both juvenile and adult, have few or no intimate handlers (Felson, 1986). People who can protect

targets are guardians. They too must be missing from the place. Guardians include friends (as when three women decide to run together in a park in order to protect each other). As well as formal authorities such as private security guards and public police, People or elevated risks of victimization. People who take care of the places are place managers. Place managers,(such as janitors, apartment managers, and others) regulate behaviour at the locations they control. Lifeguards, in addition to preventing drowning, also help assure that people who come to a pool behave themselves out of the water. For a crime to occur, such people must be absent, ineffective or negligent Eck and LaVigne. (1994). Crime pattern theory is particularly important in developing an understanding of crime and place because it combines rational choice and routine activity theory to help explain the distribution of crime across places. The distribution of offenders, targets, handlers, guardians, and managers over time and place will describe crime patterns. Changes in society have increased the number of potential targets while separating them from the people who can protect them (handlers, guardians, and managers). Reasonably, rational offenders, while engaging in their routine activities, Pattern theory explore the interactions of offenders with their physical and social environments that influence offenders' choices of targets. According to crime pattern theory, how targets come to the attention of offenders influences the distribution of crime events over time, space, and among targets (Brantingham and Brantingham, 1993). This occurs because offenders engage in routine activities. Just like other, non-offending individuals, offenders move among the spheres of home, school, work, shopping, and recreation. As they conduct their normal legitimate activities, they become aware of criminal opportunities. Thus, criminal opportunities that are not near the areas offenders routinely move through are unlikely to come to their attention. A given offender will be aware of only a subset of the possible targets available. Criminal opportunities found at places that come to the attention of

offenders have an increased risk of becoming targets (Brantingham and Brantingham, 1993). While a few offenders may aggressively seek out uncharted areas, most will conduct their searches within the areas they become familiar with through non criminal activities.

The concept of place is essential to crime pattern theory. Not only are places logically required (an offender must be in a place when an offense is committed), their characteristics influence the likelihood of a crime. Place characteristics highlighted by routine activity theory include the presence and effectiveness of managers and the presence of capable guardians. Crime pattern theory links places with desirable targets and the context within which they are found by focusing on how places come to the attention of potential offenders. It is worth noting that although crime pattern theory and routine activity theory are mutually supportive in many respects, they can give rise to differing explanations of crime at specific locations. Given a set of high-crime locations, a crime pattern theorist would focus on how offenders discover and gain access to the place. A routine activity theorist would focus instead on the behaviors of the targets and the possible absence of controllers whose presence could have prevented the offenses from taking place-guardians, handlers, and place managers. In other words, for the crime pattern theorist, places are problematic because of their location and relationship to the environment. For the routine activity theorist, places are problematic because of the types of people present and absent from the location. Clearly, both explanations can be valid in different contexts and situations.

Neighborhood crime patterns are influenced by certain indices such as places, offenders and target, substantial body of research has examined the relationship between places and crime. Empirically, these researches indicate that there is more crime at certain places than others. (Sherman, Gartin, and Buerger, 1989; Spelmen, 1995; Block and Block,

1995). The criminological literature also provides several potential theoretical explanations for these patterns. The routine activity perspective (Cohen and Felson, 1979) argues that crime occurs when motivated offenders converge with potential victims in unguarded areas. Places that promote this convergence are expected to have elevated crime rates, while places that prevent or reduce this convergence are expected to have lower crime rates. The social disorganization perspective (Shaw and McKay, 1942 Bursik and Maltz (1988) Krivo and Peterson, (1996) argued that communities with more collective efficacy (in the form of internal social networks and access to external resources and values) are likely to have less crime, while communities lacking in efficacy are likely to have more crime. Places that promote the formation of positive social ties and grant the community access to external resources are expected to reduce crime, while places that inhibit positive social ties and separate the community from external resources are likely to increase crime.

2.4 LITERATURE REVIEW

Other researcher have linked crime situation in Nigeria to purely economic factors. For instance, Odekunle (2005) Study the reasons for increasing rate of criminal behaviour in Nigerian Towns and Cities. The findings revealed that, unemployment are excuse or justification for increasing rate of criminal behaviour in Nigerian Towns and Cities.

Folashade and Abimbola (2013) study the emerging aspect of cybercrime in Zaria. The work examined the nature, causes, types and consequences of cybercrime in tertiary institutions in Zaria, the findings revealed that youths are more into cybercrime. The result showed that, cybercrime committed in tertiary institutions include desktop counterfeit, internet, internet chat room, cyber harassment, fraudulent electronic mail. They recommended that the internet users should inculcate the habit of continuously

updating their knowledge about the ever changing nature of Information and Communication Technology (ICT).

Aguda (1994) studied crime from the sociological perspective. The research was based on ecological analysis of crime in Ile Ife. The study attributed crime to varying social and economic attributes of the residents as well as the environmental characteristics of such residential setting. The findings were confirmed by Afon (2006) while examining occurrence of criminal activities in Ilorin. In light of this, Afon found out that, all categories of crime investigated occurred in high density areas for instance, house burglary was observed to be more in low density areas.

Sequel to this, Fajemirokun, Adewale, Timothy, Abimbola and Babajide (2006) used GIS approach for crime mapping in Victoria Island Lagos, Nigeria. They divided the study area into zones. The findings in the second zone revealed that crime was attributed largely to the fact that this area covered the bar beach area which serves as a leisure resort and tourist attraction; as a result, a lot of miscreants and prostitutes have turned the area to their base, making it exposed to crime cadences like rape, assault, molestation, fighting etc. the first zone has the lowest incidences of reported crime. This is because of the fact that it has the least structures in terms of business and residential purposes; it could also be due the military presence in that area.

Similarly, Adigun and Adedibu (2009) conducted a comparative analysis of urban crime in Ibadan, Zaria and Owerri between 1999 -2008 the study focused on the temporal variations in categories of crime and the trend and prevalence rate of crime during the period of study. However the key finding of the research was that annually in Ibadan and Zaria, crime of acquisition has the highest frequency while the pattern of crime is quite irregular in Owerri.

Brantingham and Brantingham (1982) studied the association between commercial burglaries per store on blocks and the presence of five types of "commercial landmarks": fast food restaurants, traditional restaurants, supermarkets, department stores, and pubs in New York. The study found that, supermarket and department store blocks had commercial burglary rates compared to blocks without these landmarks.

Engstad (1975) compared the number of auto crimes and bar crimes in Canadian society (assault, disorderly conduct, and violations of the liquor act) in small areas with hotels to the same crime counts in adjacent areas without hotels. In his study he standardized the crime counts by the number of residents living in the areas and found an association between the presence of hotels and higher rates of crime per thousand people. The study prompted in the same year to conduct another study comparing hotel areas and standardized the crime counts by calculating opportunity-based rates for each crime (i.e., dividing auto crimes in each hotel area by the number of parking places in each area, and dividing the bar crimes in the area by the number of seats in bars), Engstad (1975) found that one particular hotel area had higher auto and bar crime rates than the other hotel areas. He further conducted the same types of analysis for shopping centers using auto crimes, thefts, and other property crimes and found that areas with shopping centres had higher rates of crime per thousand populations than areas without shopping centres. When he compared the shopping centres areas for these crimes standardized by opportunity-based measures (i.e., parking places for auto crime, retail space per 1,000 square feet for thefts, and acres of shopping centres for mischief), In the same vain Engstad (1975) again found variation among the shopping center areas. Because Engstad did not compare crime events in target areas to crime events in their surrounding areas controlling for opportunities, we cannot determine if the associations he found are due to different opportunities available or to the people who use the areas. Even when controls for

opportunity were introduced, controls for other structural and compositional variables were not used. Consequently, we have no idea why such variation might exist.

Aboola (2006) investigated the impact of the increasing urban violence in Nigerian cities using residential densities as bases for data collection. The author explored the impact of increasing violence crime in Nigeria cities on physical planning, urban design and urban construction practices. Among cases reviewed, were the incidence of burglary and other crime such as armed robbery, loitering, street fighting, hooliganism, prostitution, drugs dealing and gambling which were found to be more in the high density areas (22.11%) and medium (19.49%) to the low (16.99%) decreasing with decreasing density of residential areas. The highest incidence of urban crime is robbery with (47.37%) followed by burglary with (32.02%) of the number of victims of urban violence in high density residential area.

Understand the relationship between crime and place took a "macro" approach - looking at aggregates of places such as regions, states, cities, communities and neighborhoods - rather than a "micro" approach that examines the places themselves. Recent interest in crime and place has focused on micro-level relationships. Such studies began with efforts to identify the relationship between specific aspects of urban design in Beverly Hill by (Jeffrey, 1971) or urban architecture in New York by (Newman, 1972). These was broadened to take into account a much larger set of characteristics of physical space and criminal opportunity in Medium American City (Brantingham and Brantingham, 1975, 1977, 1981; Mayhew, Clarke, Sturman and Hough 1976; Duffala, 1976; Rengert, 1980, 1981; Stoks, 1981; Le Beau, 1987; Hunter, 1988). These studies drew distinctions between the site in question and the larger geographical area (such as neighborhood, community, police beat, or city) that surrounds it. Places in this micro context are specific locations within the larger social environment. They can be as small as the area

immediately next to an automatic teller machine or as large as a block face, a strip shopping centre, or an apartment building. Often places are thought of as addresses, specific types of businesses, or blockfaces.

Eck *et al.* (2005) Looked at different methods and techniques in New York to characterize crime hotspots and a solid review was provided by the techniques which falls into three different categories: 1 global statistical tests, such as mean center, standard deviation distance and ellipse, and global tests for clustering, including the Nearest Neighbor Index, Moran's I and Geary's C statistic; 2 hotspots mapping techniques, such as point mapping, spatial ellipses using hierarchical or K-means clustering, thematic mapping using enumeration areas, quadrant mapping, and kernel density estimation; and 3 local indicators of spatial association statistics, such as the Gi and Gi* statistics. The study found that these techniques serve different purpose(s), although they are concerned with characterizing hotspots in an effort to develop a better understanding of where crimes occur, which can ultimately lead to the design of intervention strategies and the development of prospective crime mapping. However, no single technique has emerged as the "best" one for crime hotspot mapping, and there has been surprisingly little comparative research on their strengths and weaknesses, with some notable exceptions (Chainey, 2005; Chainey *et al.*, 2008).

Most crime hotspot analysis techniques are based on a dataset of individual locations, with each point representing one or multiple crime incidents. The dataset of crime incidents is assumed to be a very good representation of the actual crimes incident (i.e., the sample is complete or very close to complete and the locations are accurate). These locations are usually derived through the geocoding of the address information in the crime incident reports. While the comparison of different hotspot analysis techniques has

received some attention in the literature (e.g., Grubestic, 2006), very little attention has been paid to the quality of the geocoding process and its effect on hotspot analysis.

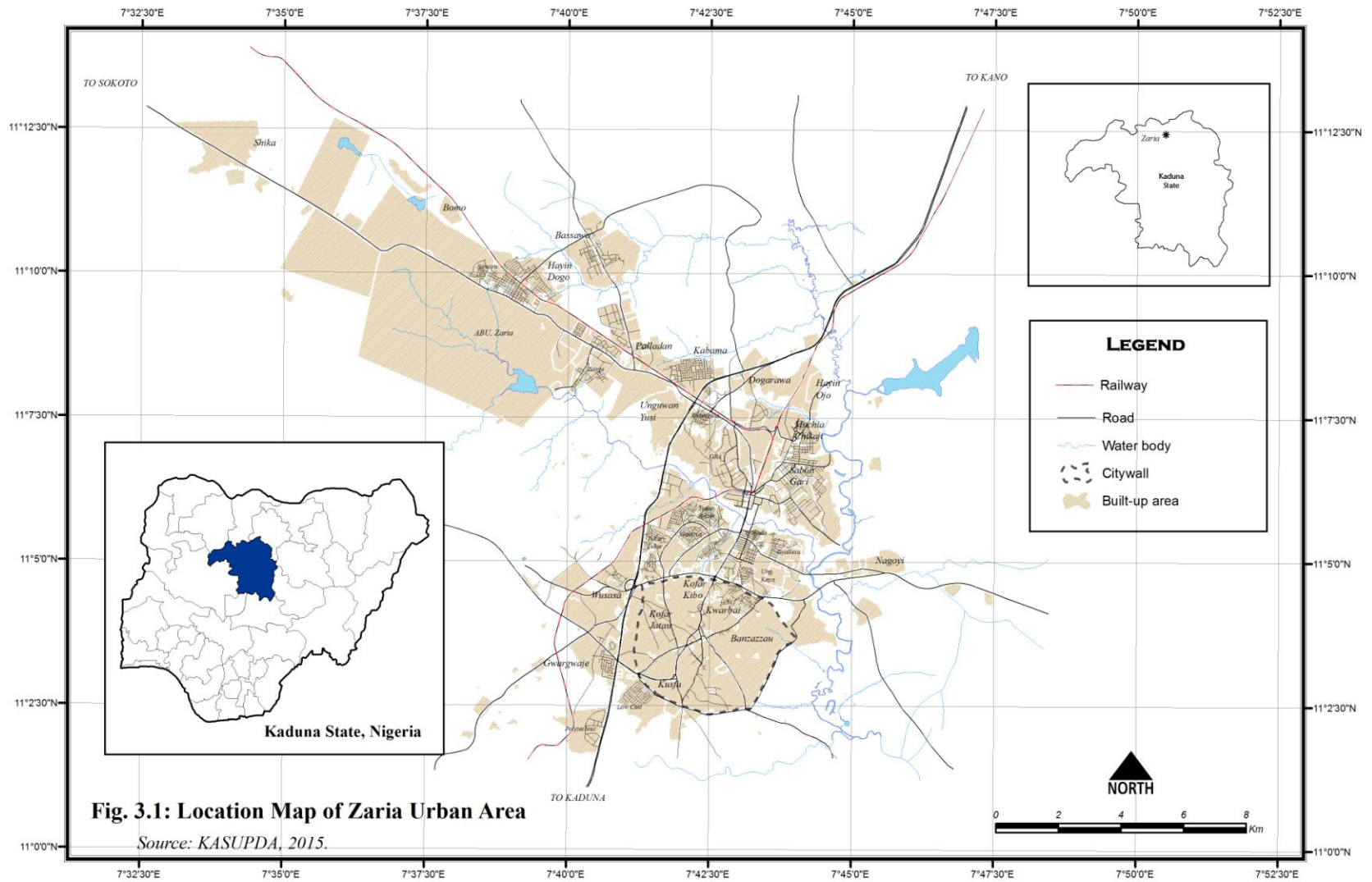
CHAPTER THREE: THE STUDY AREA AND METHODOLOGY

3.2 THE STUDY AREA

3.2.1 Geographic Location

Zaria town is located between Latitudes $10^{\circ}57'N$ and $11^{\circ}15''N$ and Longitudes $7^{\circ}39' E$ and $7^{\circ}53'E$. (see fig 1). The urban area is made up of Sabon Gari and Zaria local government areas and some parts of Giwa Local government area. Like Shika about 7.5km from Ahmadu Bello University main campus, Samaru.

The Zaria town is bounded by Kudana to the North, Igabi to the South, Soba to the East and Giwa LGA to the West. Zaria is about 84 km from Kudana, 50 km from Igabi, 40 km from Soba and 29 km from Giwa. A railway line running from the south-west crosses river Kubanni into the town. It has siding at square 6027, and then bifurcates at square 6028 where it has a station (Sabon Gari Railway Compound). A branch line runs north-west wards Funtua, while the other runs north-east across River Galma to Kano. All trains going to Kano, Gusau and Malumfashi are diverted from Zaria junction that is why it is an important nodal point for the railway system. Similarly, the major roads (Kaduna, Sokoto, Bassawa and New Jos Roads) running south-west wards, north-west wards, north wards and east wards links Zaria town to important towns like Kaduna, Funtua, Kano and Jos which also makes it an important nodal point for the road system. *Britannica Encyclopedia. (Retrieved 2007-02-04)*



3.2.2 History of Zaria

Zaria is one of the original seven Hausa city-states and it is situated in the southern part of Hausa land in Northern Nigeria. It is the administrative headquarter of the Zazzau Emirate.

In the late 1450s, Islam arrived Zaria by the way of its sister Habe cities, Kano and Katsina. Along with Islam, trade also flourished between the cities as traders brought camel caravans filled with salt in exchange for slaves and grain. Between the fifteenth and sixteenth century, the Emirate became a tributary state of the Songhai Empire. In 1901, Zaria came under British rule by the advancement of British forces led by Sir Frederick Lugard. The British found in Zaria a well established feudal society of Muslim faith. They introduced the system of indirect rule with the intention of preserving the local and traditional institutions and customs. The city is considered by some to be a main center of Hausa agriculture. Not only is Zaria a market town for the surrounding areas like Soba, Giwa and Makarfi, it is the home of numerous artisans, from traditional crafts like leather work, dyeing and cap making, print shops and furniture makers. Zaria is also the center of a textile industry that for over 200 years has made elaborately hand-embroidered robes that are worn by men throughout Nigeria and West Africa. Gihring (1984)

3.2.3 Climatic Condition

According to Ayoade (1988), Zaria has a tropical continental climate type characterized by wet and dry season. The tropical continental is more pronounced in the dry seasons particularly in December and January. The dry season is dominated by the north-east trade wind called Harmattan which prevails from November to February. The dry season is also rainless from October to April. The wet season is dominated by the tropical maritime trade wind which starts around May to October. The area has a mean daily

temperature showing a major peak in April. As such, temperatures are hot all year round except for the dry cool and dusty months of hamattan in November to February. The maximum temperature of 29⁰C seldom falls from about 36⁰C as in April to about 27⁰C in the heart of rain season (August-October). The annual rainfall is about 1000mm (Ayoade, 1988).

These seasons are controlled by the apparent movement of an imaginary line known as the Inter-Tropical Discontinuity (ITD), which in turn, is dictated by the two dominated trade winds; the tropical continental and the tropical maritime. While according to Thornwaites moisture index the climate of Kaduna falls under the dry sub-humid type (Ayoade, 1988).

3.2.4 Vegetation

The natural vegetation of the study area is that of the Northern Guinea Savannah with grass dominating and scattered trees hardly higher than 4.6m with broad leaves. Meanwhile, the seasonal character of rainfall in the study area has influenced the vegetation which turns evergreen during the wet season and pale brown in the dry season respectively. Thus, the dominant tree species are *Isobertina Doka*, *Dodoneab spp*, and grass communities consist of *Hyperhenia* and *Andropogon* species. In the city proper 2/5/2016 vegetation is characterized by Silk cotton, Baobab and other protected trees. However, man have greatly affected the vegetation formation in the area, through his activities like; bush burning, cultivation of crops, grazing, lumbering, urbanization and industrial activities among others. The vegetation formation varies and associated with distinct ecological site with particular regard to the nature of the soil (Oguntoyinbo, 1983).

3.2.5 *People and culture*

The population of the two local government areas under study is approximately 695,069 as revealed by the federal republic of Nigeria Gazette (2007). The study area is a host to various educational institutions and economic activities. The regular employment for the inhabitants includes small-scale enterprises, services industries, trading and other commercial activities. Since the town has obviously transformed to urban centre, secondary and tertiary activities are also present in the area among which are American British Tobacco Company, the Premier Seed Industries and several banks. These economic activities have attracted several business men and women including foreigners. This have obviously brought a new look to the economic activities of Zaria which in turn has boosted its urban status. For instance, Samaru village emerged as a result of various educational institutions while Tudun Wada settlement serves as an extension of the city as it was initially created to provide home for non-Muslim Hausa. According to Inobeme, (2009) the growth of villages in the region is associated with some favourable condition found there and there are some of these villages that grew into larger settlements where the soils are particularly fertile or, through the concentration of population as a result of trade or cloth making.

3.2.6 *Five Urban Sector of Zaria Metropolis*

The present day Zaria is made up of five urban districts namely; Samaru, GRA, Sabon Gari, Tudun Wada and Zaria City (See Fig 3.2).

a. *Samaru*

Samaru is a religiously and culturally mixed settlement. Samaru evolved from a small colonial farming settlement into a large community. Samaru village owes its growth to the influence of Ahmadu Bello University, National Institute for Leather Research Technology and the Institute for Agricultural Research. The settlement inhabited mostly

by people working in the university. The settlement has expanded over time to include other settlement like Zango, Palladan, Layin Zomo and Bomo. (*See Fig 2*)

b. The Government Reservation Area (GRA)

The Government Reservation Area (GRA), at inception was the housing quarter of the European and now inhabited by indigenous Government officers and elites of the society. The neighbourhood is well laid out, adequately serviced and open spaces/recreational areas and public facilities. The Hanwa layout extends into the GRA and is an extension of Hanwa village.

c. Sabon Gari

Sabon Gari is a British colonial creation to accommodate migrants from the southern parts of the country. It has the biggest market of the five districts and in addition, is an industrial hub. The railway station is also located in the district. Five neighbourhoods make up the district: Sabongari, Muchia, Hayin Ojo, Dogarawa, and Kwangila. Sabongari and Muchia are densely populated with small portions organised for grid iron developments. Because of its industrial status for its numerous commercial activities, buildings are generally mixed in term of development.

d. Tudun Wada

Tudun Wada is situated immediately North of the main city gate. It was the original strangers' quarters for non-natives of Northern Nigerian origin. Tudun Wada has a grid-iron street pattern which was laid out in 1914. It was part of the Emirs farm in 1904 which was later developed as a result of the colonial administration policy.

Its population growth owns much to the employment opportunities offered by establishments like; Federal College of Education, ABU Institute of Administration, ABU

Teaching Hospital and Kaduna State polytechnic. Several expansions have been made to Tudun Wada as it now extends to Gaskiya and Tudun- Jukun and Tukur- Tukur.

e. Zaria City

Zaria city, which is the headquarters of the Zazzau Emirate, lies in the South of Zaria.

The original walled city retains much of the physical character of the traditional indigenous settlement of the Muslim Hausa-Fulani population. The city still has a traditional character of perimeter wall, a complex maze of mud-walled compounds, and major roads secured by city gates (Kofas) leading to the Emir's palace (Fadar Sarkin Zazzau) at Babban Dodo, the Friday mosque, and the market area.

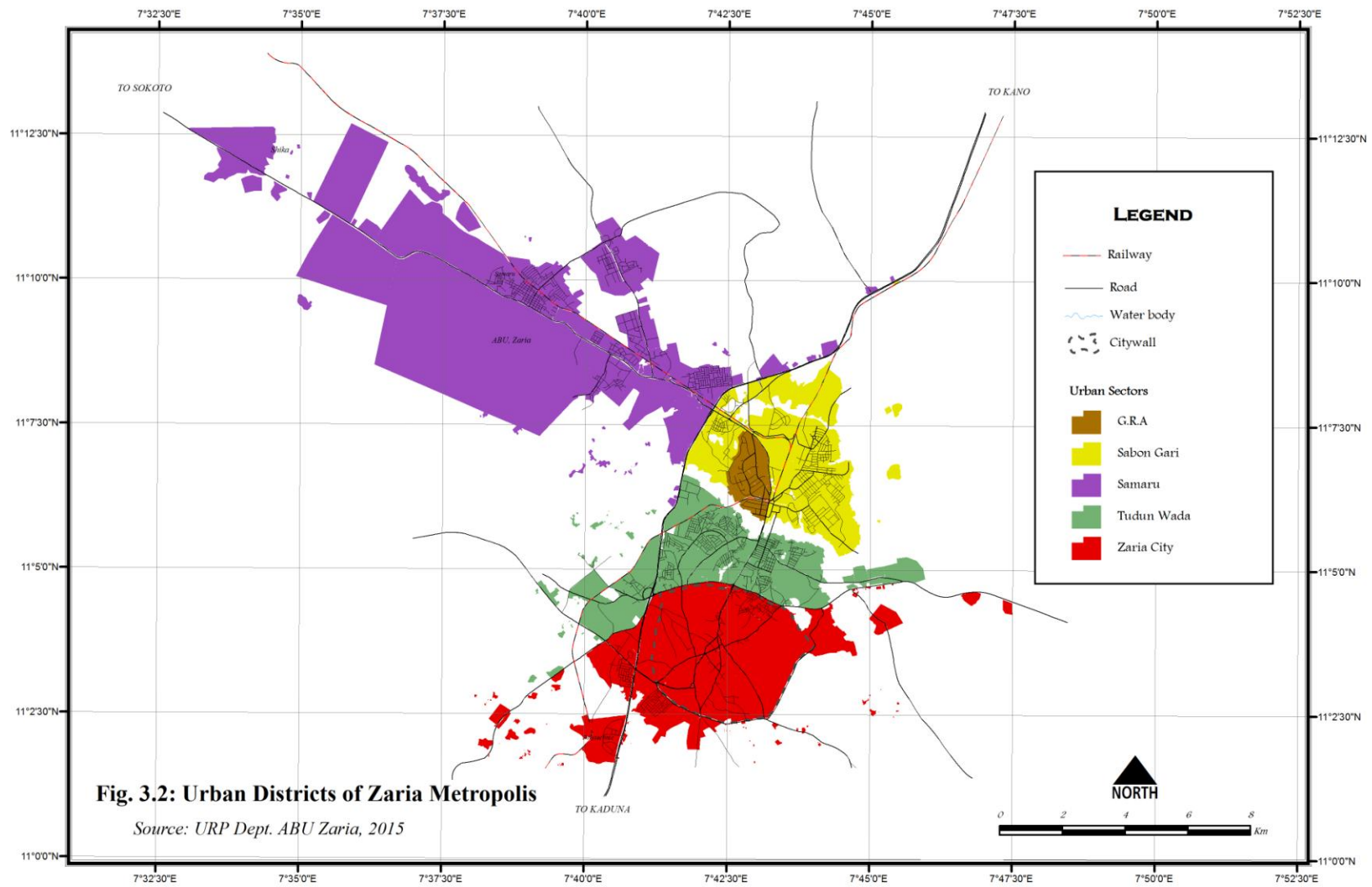


Fig. 3.2: Urban Districts of Zaria Metropolis

Source: URP Dept. ABU Zaria, 2015

3.3. RESEARCH METHODS

3.3.1 Reconnaissance Survey

Reconnaissance Survey was carried out to get acquainted with the study area to get first hand and relevant information. Discussions were made with the Nigerian police Department of Crime Investigation, Area Command Zaria, Nigerian Army Intelligent Department Depot Nigerian Army, Department of state security services (DSSS), Zaria vigilante group of the designated areas, Local chiefs and some selected youths of crime prone locations,.

This chapter discussed about the study area in terms of the history, location, climatic condition, people and culture and economy. It also describes the data sources, method of data collection and the techniques used for data analysis.

3.3.2 Materials used for the Study

3.3.2.1 Hardware used:

These are computer peripherals used to make the data capture, mapping task and data processing in this work. Table 3.1 shows hardware used for the study

Table 3.1 Hardware for the Study

Hardware	Usage
Laptop computer	Used for processing all information obtained from designated regions
Digital camera	Used to capture prominent features around the hotspots
A ₀ scanner	(i). Used for scanning hard copy map of the study area in order to convert it in digital format in ArcGIS 10.1 environment. (ii.) Used to print out hard copy maps.
Hand held Garmin 76CSX GPS	Used to fetching coordinates of crime spots and police facilities

3.3.2.2 Software used:

These are computer programmes or applications installed in the computer system that would aid mapping and analysis, satellite image, image stitching, typing and statistical analysis. (See Table 3.2)

Table 3.2 Software used for the study

Software	Usage
ArcGIS 10.1	For mapping and analysis
Google Earth Pro 6	For downloading the aerial photograph of the study area
Panavue Image Assembler	For stitching the image parts to form a whole
Microsoft office Package	For typing and statistical analysis

3.3.3 Types and Sources of Data Used

Data for this study includes: crime records, Satellite imagery of Zaria, Zaria topo sheet coordinates of crime scene, Zaria Master plan, Location of Police station.

The data for the study were obtained through interview and field survey. Data was also collected from published and unpublished materials including journals, textbooks, thesis, dissertations, internet and unpublished literatures. The Nigerian Police Force, Zaria provided vital data for this work, the Division of State Security Service (DSSS), 93 Intelligence Department Depot Nigerian Army Zaria, Local Chiefs and selected youths of some designated locations in Zaria. Table 3.3 gives the data types and sources

Table 3.3: Data types and Sources

S/N	Data Types	Sources
1.	Crimes record	Nigerian Police Force (NPF) and Department of State Security Service (DSSS)
2.	Intelligence report	Department of State Security Service (DSSS) and 93 Intelligence Department Depot Nigerian Army, Zaria
3.	Map of Zaria Metropolis Scale: (1:150,000)	Kaduna State Urban Planning and Development Authority (KASUPDA)
4.	Existing Zaria Master Plan to extract 5 Urban Sectots of Zaria, Metropolis. for easy Comparism of crime concentration.	Department of Urban and Regional Planning, ABU, Zaria
5.	Coordinates of crime scenes and police facilities (police posts and stations)	Hand Held Global Positioning System (GPS)
6.	Opinion of residents on satisfaction of community policing , security and major factors responsible for crimes in the metropolis	Oral interview

Source: Field Survey

3.3.4 Technique of Data Collection

First and foremost, the researcher conducted interview with the Nigerian police, Department of State Security Service (DSSS) and 93 Military Intelligence Group Zaria. In the researcher's quest to ascertain crime information gotten from the law enforcement agents, total number of 60 Respondents (Vigilante Leaders, Local Chiefs and Selected Youths in the designated areas) were interviewed 12 from each of the 5 urban districts and it was recorded using Sony micro cassette recorder for further processing. The nature

sof the topic gives room to the researcher to restrict himself to group of individuals (Vigilante Leaders, Local Chiefs and Selected Youths in the designated areas) saddled with the responsibilities of maintaining laws and orders in our society, which Zaria metropolis is not an exception, it is clear fact that, in Nigerian Society crime issues are always difficult to extract from public individuals because the confidentiality of the information is not assured. In some cases people suffered innocently as a result of crime information given to law enforcement agencies, such negative act has contributed to why people failed to give crime information even when they are seen around the crime scene. Consideraing these reasons the researcher deemed it fit work with those special group of people to achieve the result of the study. Interviewer (the researcher) spent approximately 1hour interviewing interviewees about day-to-day activities and the routes that were used to commit criminal activities. All data have been presented in tables, charts and maps for clearer understanding of the findings. A total of 119 crime cases were recorded within the period under study and their respective crime spots were plotted in ArcGIS 10 and a database was built to aid pattern/density analysis to determine crime hotspots. The coordinates of available police facilities (police posts and stations) were also plotted in ArcGIS to show spatial distribution and aid buffer analysis using relevant service radius to determine neighbourhoods that are within reach and those that are not.

3.3.3.1 Data collection

The crime spots and police facilities visited by the researcher in order to collect geographic coordinates of each spot in Zaria metropolis using Global Positioning System (GPS) which has capability to record coordinates and save it.

3.3.3.2 Data Processing

The crime spots and police facilities coordinates collected from the study area using GPS were typed in Microsoft excel and saved in CSV format; it was imported into ArcGIS environment and converted to shapfiles for more analysis. Furthermore, the following attribute data were added; crime spots, crime types, time of committed crime, urban sectors and police stations. Which help in summarizing the data in tabular form.

3.3.4 Data Analysis

Objective I: To identify categories and types of crime in Zaria metropolis

Reported cases of crime obtained from police, Department of State Security Service (DSSS), 93 Military Intelligence Group and records from field survey were used to determine the types of crime that occurred in a designated crime spots in Zaria metropolis and the results was presented using tables and charts.

Objective II: To assess the time crimes are committed in the areas

This was achieved through GIS query operations of the imported crime information obtained from the field to show those crimes that happened at night and those that happened in the day as well as those that happened both in the day and at night

respectively to enable security operatives to map out strategies for deploying men and equipments considering time of occurrence to minimized casualty.

Objective III: To map out crime spots and buffer police stations in Zaria metropolis

This was achieved through overlaying the coordinates of crime spot and police stations obtained from the field on the base map of Zaria metropolis to show spatial distribution and aid buffer analysis of police facilities to ascertain their suitability in terms of crime management in the study area. Buffer wizard tool in ArcGIS with a service radius of 1.5km (1500m) was used to buffer Neighbourhood within the buffer region or Zone to signify areas that are in close proximity to police facilities and those neighbourhood that do not have easy access to police facilities.

Objective IV: To create a spatial database for recorded crimes in Zaria metropolis to aid density analysis and determine crime hotspots

This was achieved by entering the data obtained from the police and other security operatives and into Microsoft Excel and then imported into the ArcGIS environment to create the database for more analysis. Additionally, the spatial database for for each map feature e.i police facilities and crime spots aided the Kernel density analysis.

The Kernel density estimation which is a local interpretation method that associates each known spots (i.e crime spots) with a Kernel function in form of bivariate probability function has helped in determining where crimes are more concentrated (crime hotspots) and areas where crimes are less concentrated (crime cold spots)

i. **Objective V: Analyze factors responsible for crime growth within the study area.**

This was achieved through sampled opinion of residents' find out the lev

el of satisfactions on police level of response to distress calls with focus on pinpointing those managerial concepts to the law agents and by extensions to citizens of Zaria and Nigeria at large. So as to enhance quick intervention from the police and other security operatives to the scene of crime to avert loss of lives and properties. The methodology flow chart of the study is presented in figure 3.3.

The flow chart in fig. 3.3 shows the steps taken to accomplish the objectives of this research work.

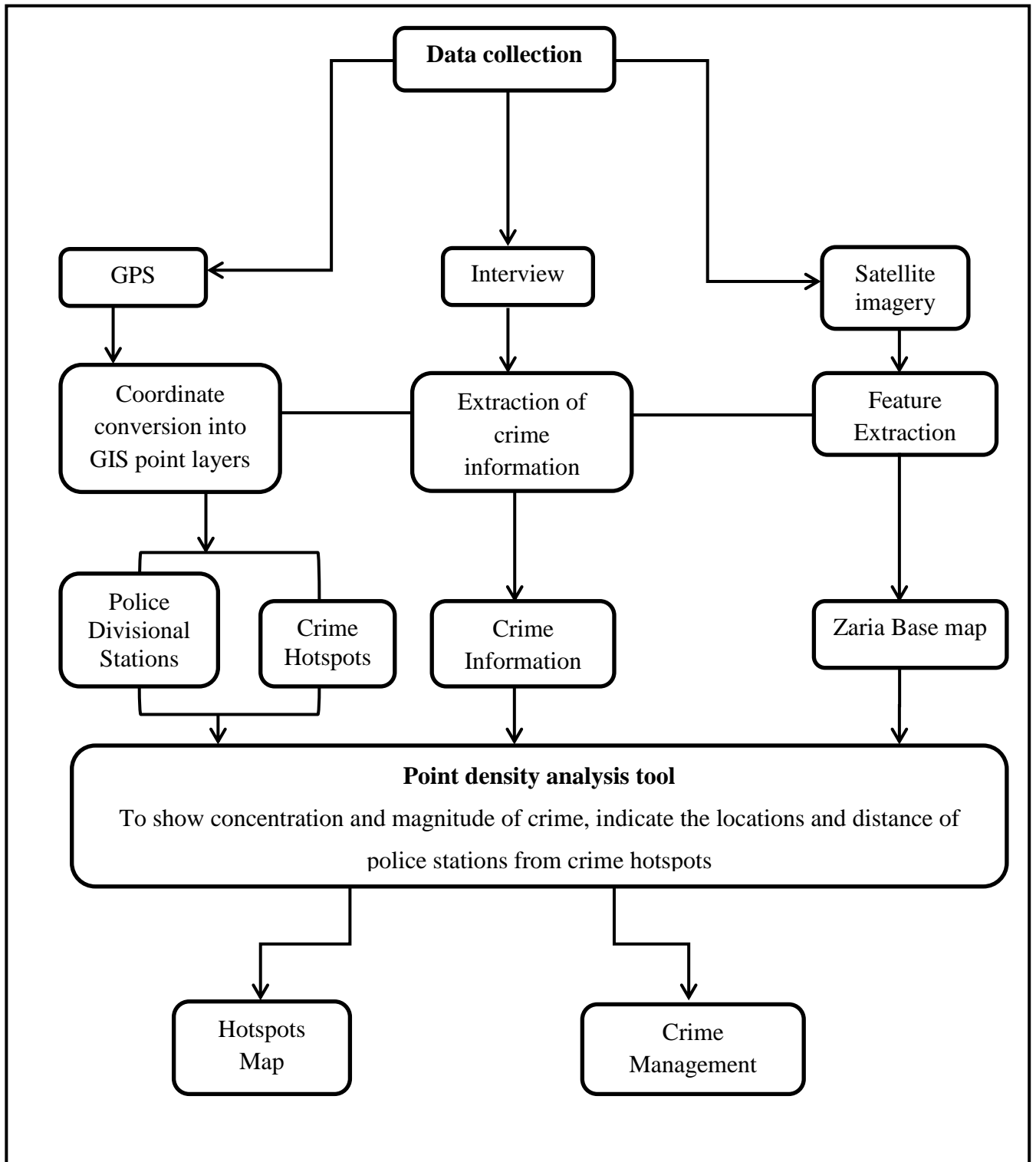


Fig 3.3: Dataset and Analysis Flowchart

CHAPTER FOUR: RESULT AND DISCUSSION

4.1 INTRODUCTION

This chapter deals with the presentation and discussion of the spatial data collected from the field. This chapter is concerned with mapping and management of crime hotspots in Zaria metropolis this was done using the Kernel Density Estimation (KDE) to displayed areas with low, high and very high crime concentrations (hotspots). Also 1.5km radius buffer analysis of Police Stations in relation to crime spots in Zaria metropolis according to international standards. Finally, geometry tool of ArcGIS was used to calculate the distance from crime hotspots to the nearest police facility to display the distance coverage of crime hotspots to nearest police station in Zaria metropolis.

4.2 SPATIAL DISTRIBUTION OF THE RECORDED CRIME IN ZARIA METROPOLIS

Fig 4.1 displayed recorded crime in Zaria metropolis used to determine the concentration of crime in the study area. It shows that Sabon Gari has the highest number of crime recorded followed by Samaru and Zaria City urban district respectively. While GRA has the least number of crime recorded. Therefore, GRA is more conducive than all other urban districts in Zaria Metropolis.

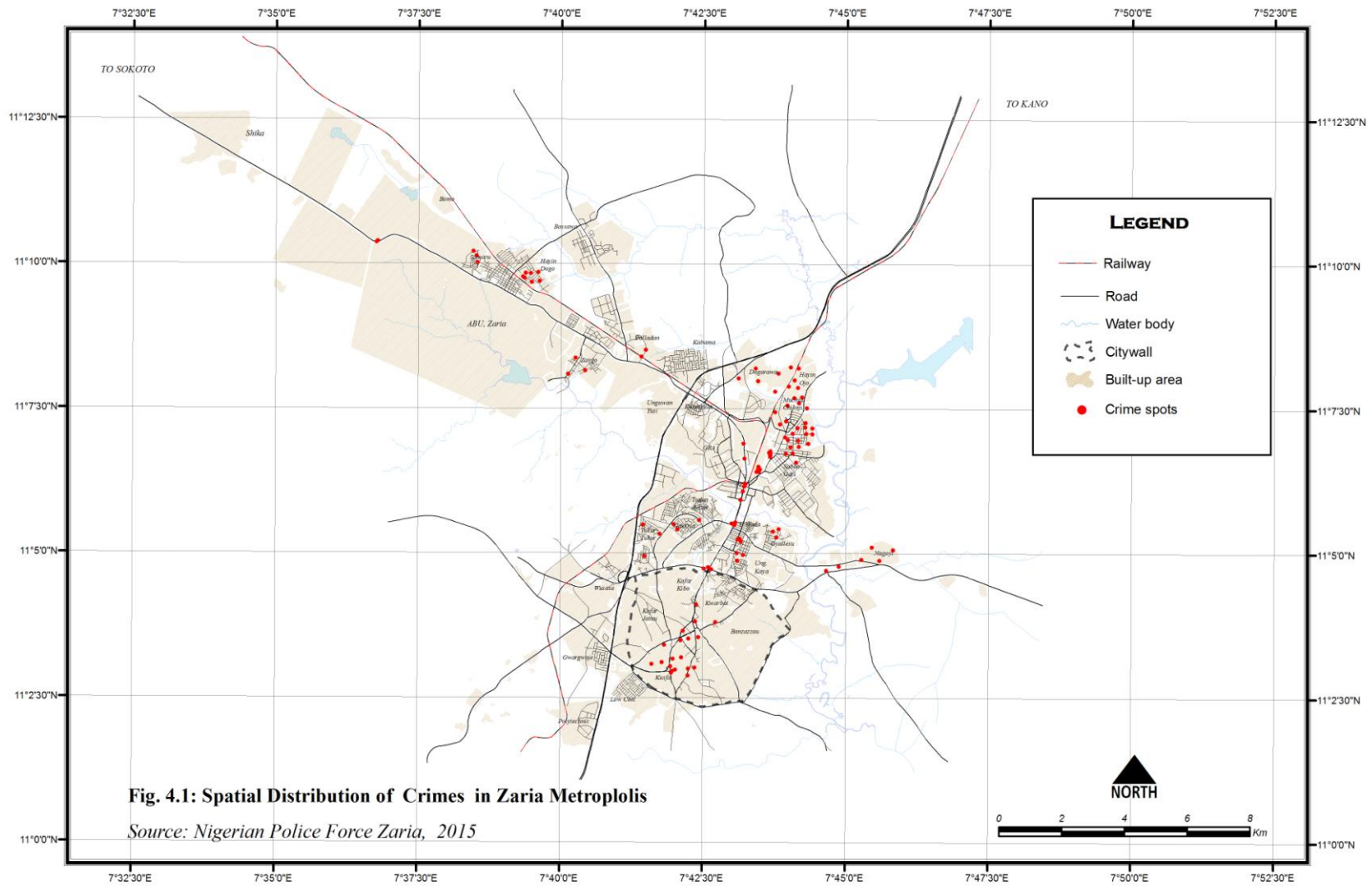


Fig. 4.1: Spatial Distribution of Crimes in Zaria Metropolis

Source: Nigerian Police Force Zaria, 2015

4.3 TIME OF COMMITTED CRIMES

Fig 4.2 displayed crimes that occurred during the day and those that occurred at night respectively, to pave way (s) for law enforcement agents to mapped out strategies on how to deploy men and equipment considering the time certain crime are committed in the metropolis to curb the menace of criminality in the study area. Also to create awareness to the public to be mindful of how they move in certain location of Zaria metropolis bearing in mind time certain crimes are committed in the Zaria metropolis, as is often said that security is every body's business.

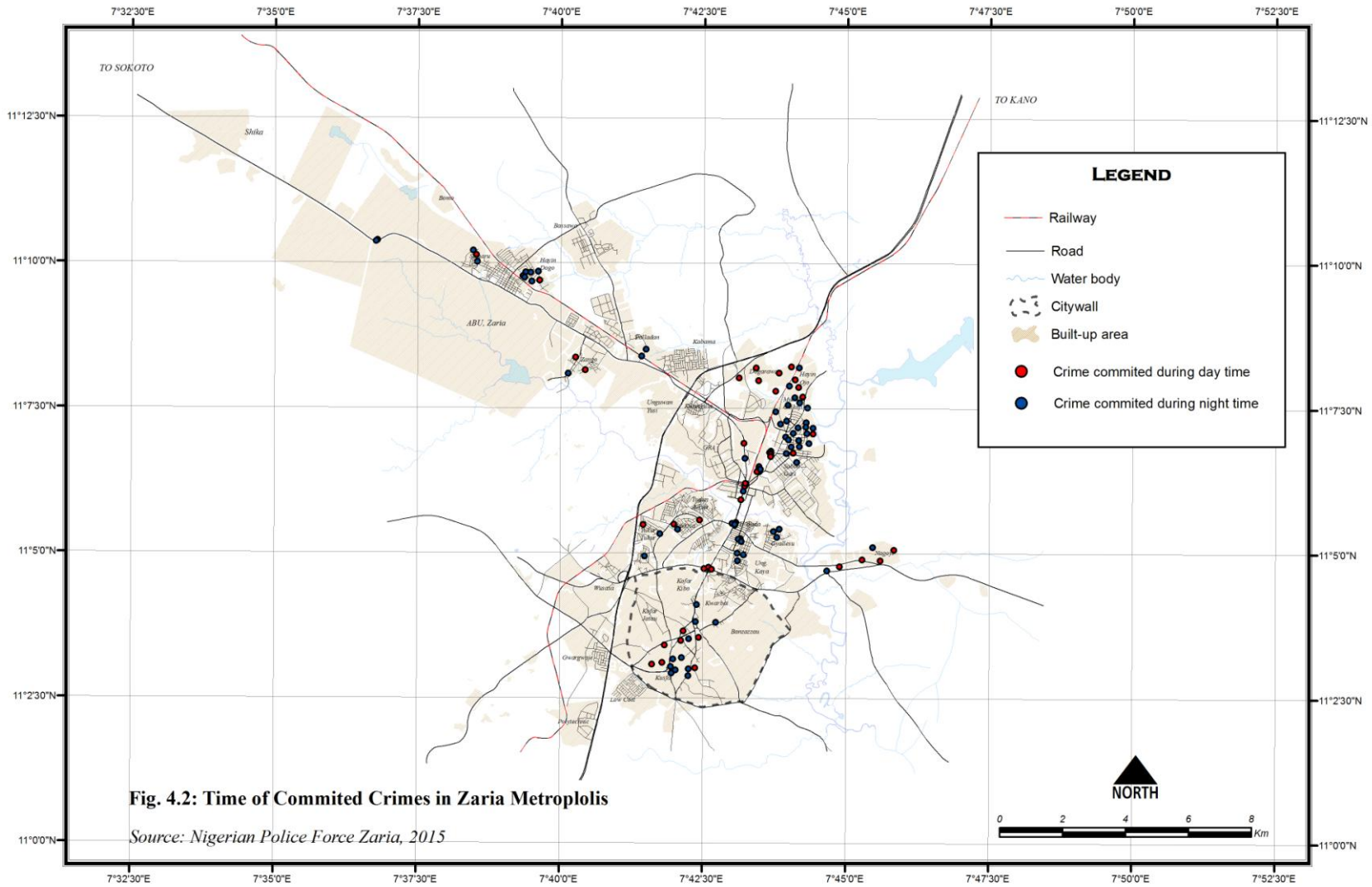


Fig. 4.2: Time of Committed Crimes in Zaria Metropolis

Source: Nigerian Police Force Zaria, 2015

4.4 TEMPORAL VARIATION OF CRIMES IN ZARIA METROPOLIS

Query operation which is a systematic scientific procedure of making inquiry in a GIS environment to show or display vital information was the basis for establishing the temporal variation of crimes in Zaria metropolis.

Table 4.1: Day and night time Crimes in Zaria Metropolis

Time of occurrence	Frequency	Percentage (%)
Day	43	36.13
Night	76	63.87
Total	119	100

Source: Authors GIS Analysis, 2015.

The GIS query operation reveal that for Zaria as a whole, 43 out of the total of 119 happen during daytime while 76 crimes were committed at night (see Table 4.2). Night crimes were more prominent in neighbourhoods like Sabon Gari, Muchia, Hayin-Ojo, Hayin-Dogo, Tudun-Wada and Gyallesu. In the same direction the query operation also reveals that Sabon Gari urban district has the highest number of night crimes with a total of 31 counts followed by Tudun-Wada and Samaru urban districts with 19 and 13 counts respectively. GRA has the lowest night crime with a count of 1 recorded case

Table 4.2: Neighbourhoods where night crimes are prominent

Neighbourhoods	Frequency	Percentage (%)
Sabon Gari	31	40.78
Muchia	19	25
Hayin Ojo	12	15.78
Zaria City	06	7.78
GRA	01	1.31
Others	07	5.32
Total	76	100

Source: Authors Analysis, 2015.

As regards crime committed during the day, Sabon-Gari urban district has 20 counts which is the highest followed by Tudun-Wada urban district with 10 counts. GRA has the least number of day crimes with only 1 count as contained in the GIS query operations.

Table 4.3: Neighbourhoods where day time crimes are prominent

Neighbourhoods	Frequency	Percentage (%)
Sabon Gari	10	23.25
Zaria City	08	18.60
Tudun Wada	07	16.28
Samaru	02	4.65
GRA	01	1.01
Others	15	36.21
Total	43	100

Source: Authors Analysis, 2015.

4.5 CRIME TYPES RECORDED IN ZARIA METROPOLIS

Crime types recorded in Zaria metropolis obtained from Police Area Command Zaria, Department of State Security Services (DSSS) Zaria, 93 Military Intelligence Group Zaria, Local Chiefs and Vigilante Leaders from the 5 Urban district of Zaria metropolis. It would be observed that drug abuse is the most prominent crime with 25 recorded cases which is about 21.01% of the total crime, second is intimidation with 20 recorded cases accounting for 16.81% of the total crime cases. The third prominent crime is assault (11.76%) and the fourth is theft (11%). The least crimes recorded are burglary (1.68%), homicide (1.68%), rape (3.36%) and robbery (3.36%). See (Table 4.1)

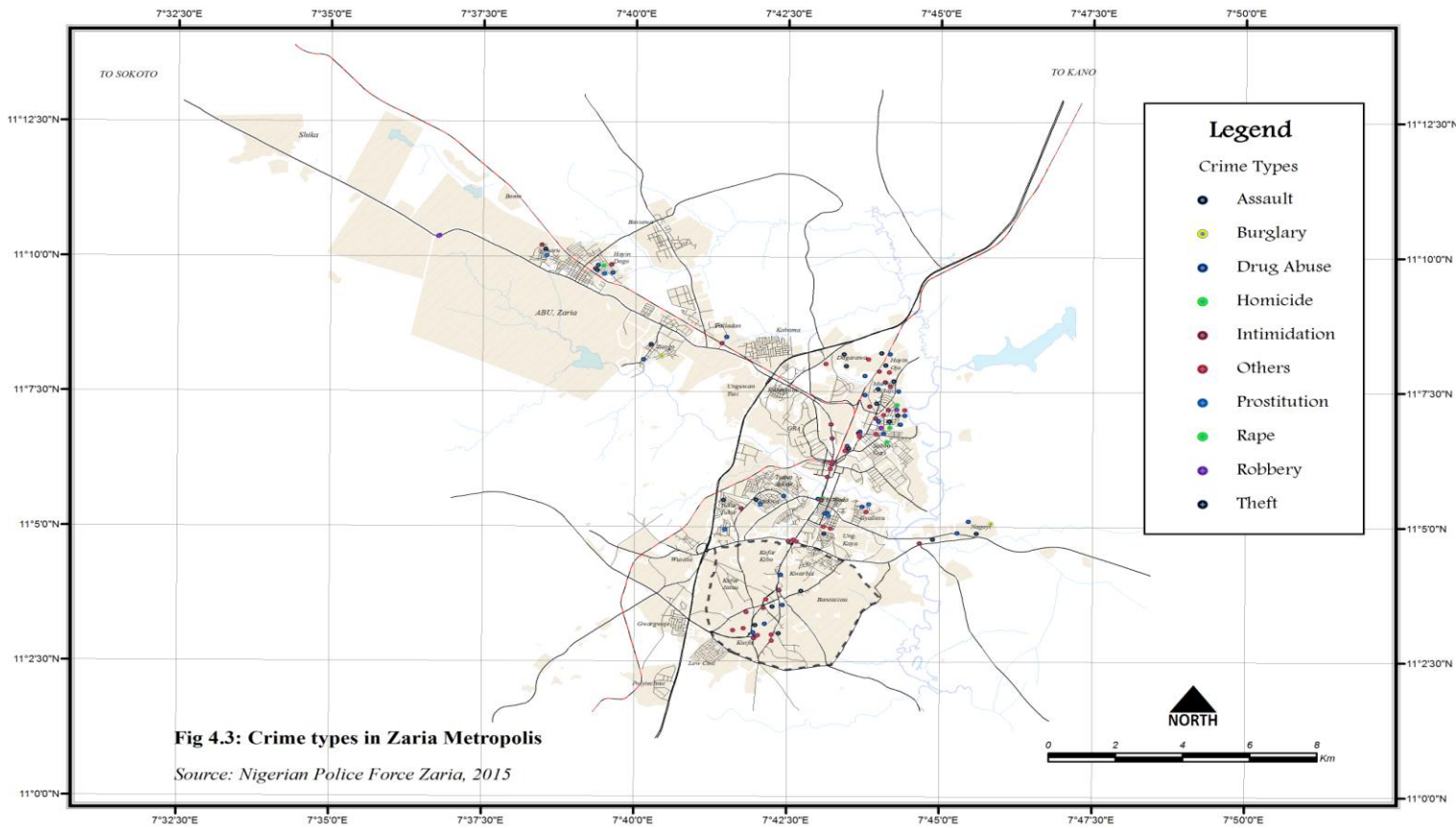
Table 4.4: Crime Types Recorded in Zaria Metropolis

Types of crime Recorded in Zaria Metropolis	No. of cases recorded	Percentage
Assault	14	11.76
Burglary	2	1.68
Drug Abuse	25	21.01
Homicide	2	1.68
Intimidation	20	16.81
Prostitution	6	5.04
Rape	4	3.36
Robbery	4	3.36
Theft	13	11.00
Others (Extortion, Hurt, Mischief and Fighting)	29	24.37
TOTAL	119	100

Source: field survey

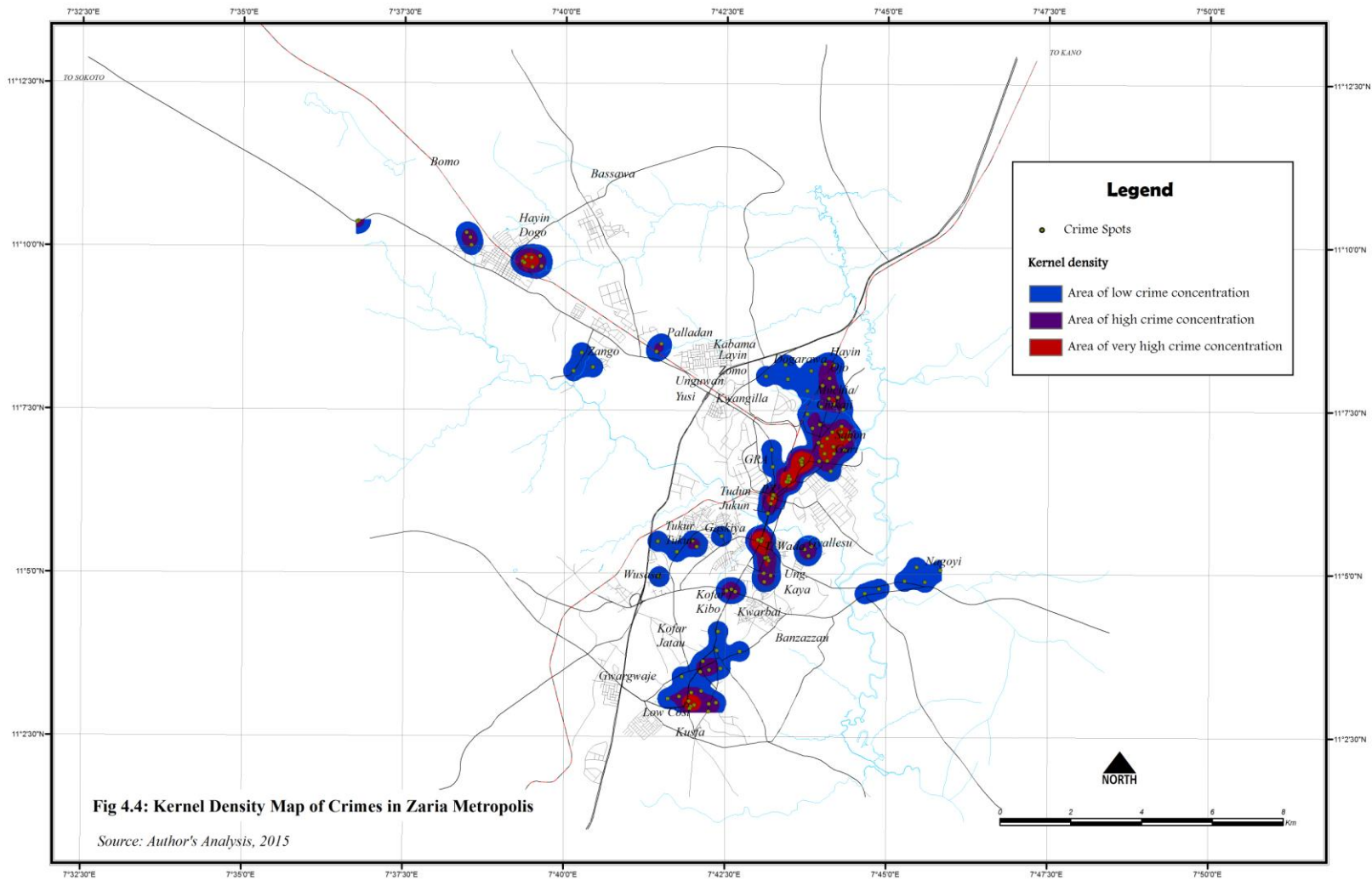
Within the period of study the researcher painstakingly obtained crime records from the relevant sources as aforementioned, entered into ArcGIS environment manipulated to displayed crimes that are more common in a particular area in Zaria Metropolis and also to show how often such crime(s) occurred.

From Table 4.3 and Fig 4.3 it would be observed that drug abuse is the most prominent crime with 25 recorded cases which is about 21.01% of the total crime, second is intimidation with 20 recorded cases accounting for 16.81% of the total crime cases. The third prominent crime is assault (11.76%) and the fourth is theft (11%). The least crimes recorded are burglary (1.68%), homicide (1.68%), rape (3.36%) and robbery (3.36%).



4.6 CRIME HOTSPOTS IN ZARIA METROPOLIS

These are areas with low, high and very high crime concentrations (hotspots). For instance, areas coloured red are regions of very high crime concentration (hotspots). The purple coloured portions of the map are areas with high concentration of crimes while the blue coloured portions are low crime areas. The main crime hotspots areas are Sabon Gari, PZ, Tudun Wada, Kusfa and Hayin Dogo neighbourhoods. Other areas like Chikaji, Muchia, Hayin Ojo, Kofar Doka and Gyellesu neighbourhoods also have a considerably high concentration of crimes. See (fig.4.4).



4.7 POLICE FACILITIES OF ZARIA

The table 4.4 displayed the available police station and their coordinates to enhance buffer analysis to show the spatial distribution of police station in Zaria Metropolis.

Table 4.5 Police Stations and Coordinates in Zaria Metropolis

Location	X_Coordinate	Y_Coordinate
Baban Dodo	358582.78	1222944.88
Layin Sarki Rd, T/Wada	360325.55	1226046.54
Danmagaji	356705.56	1225143.19
Aminu Rd., Sabon Gari	360963.63	1228332.41
Sokoto Rd.	351183.69	1234559.64
GRA, Zaria	360179.92	1228000.79
Kofar Kuyambana	356714.96	1221670.07
Amaru	359532.61	1222055.70
MTD	360170.93	1229801.08
Gwargwage	355757.89	1222816.60
Police Post, Zaria City Market	357876.07	1221858.79
Railway Police station	360580.56	1228724.46

Source: field survey, 2016

The researcher painstakingly obtained the coordinates of the police stations in Zaria Metropolis entered into ArcGIS environment manipulated to display the locations of police stations on a map. (See Fig. 4.5)

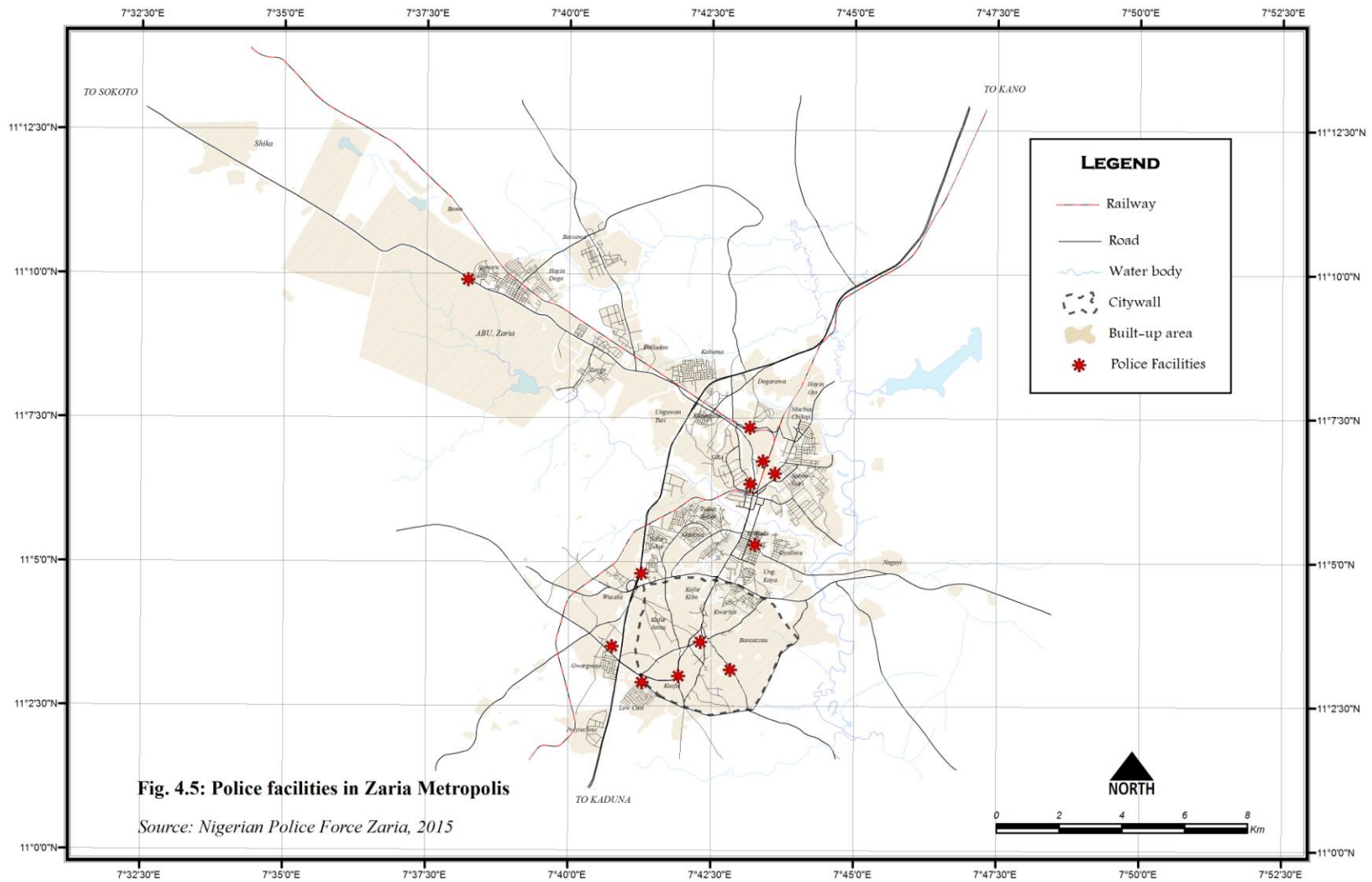


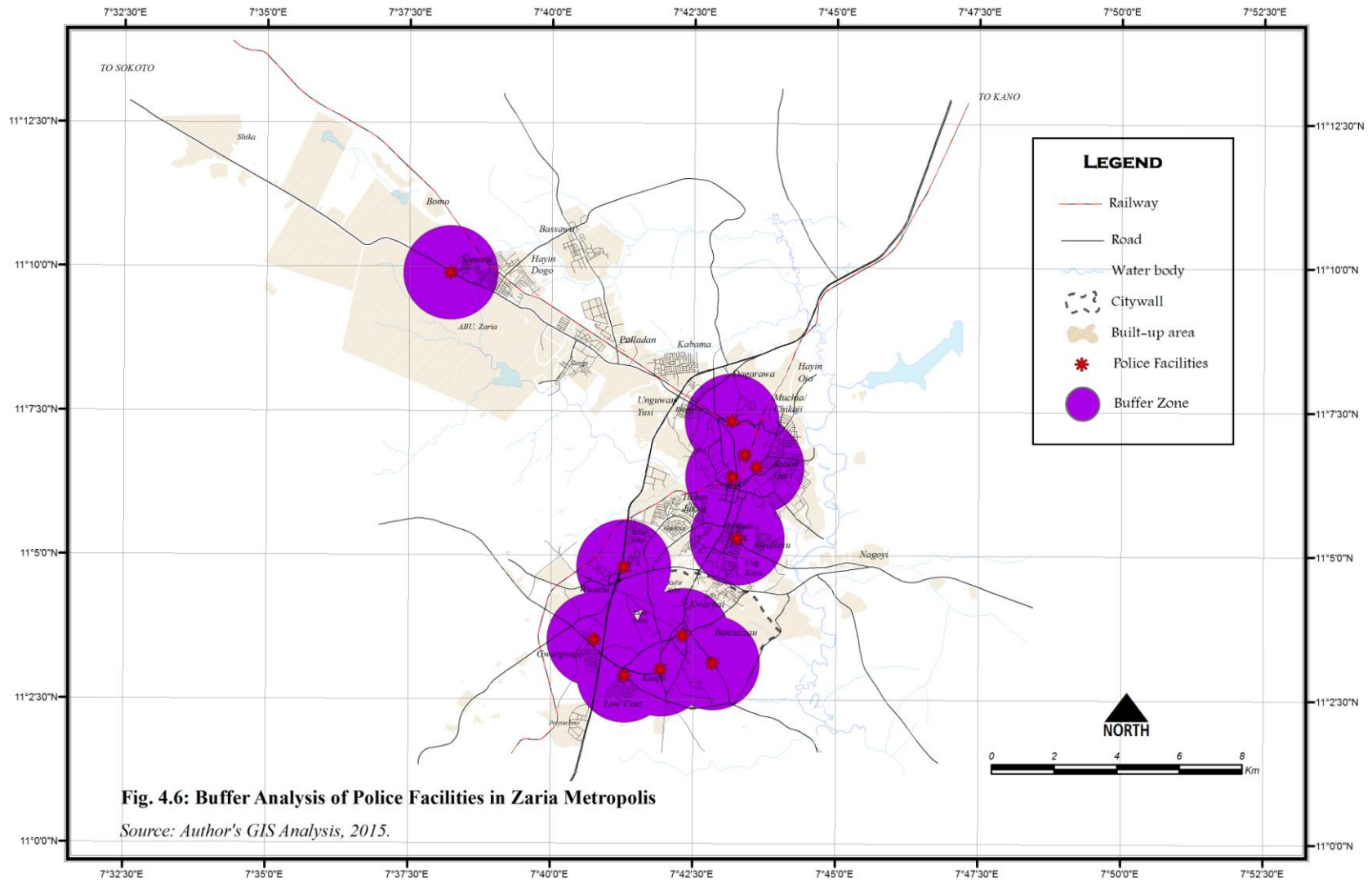
Fig. 4.5: Police facilities in Zaria Metropolis

Source: Nigerian Police Force Zaria, 2015

4.7.1 Buffering of Police Facilities in Zaria Metropolis

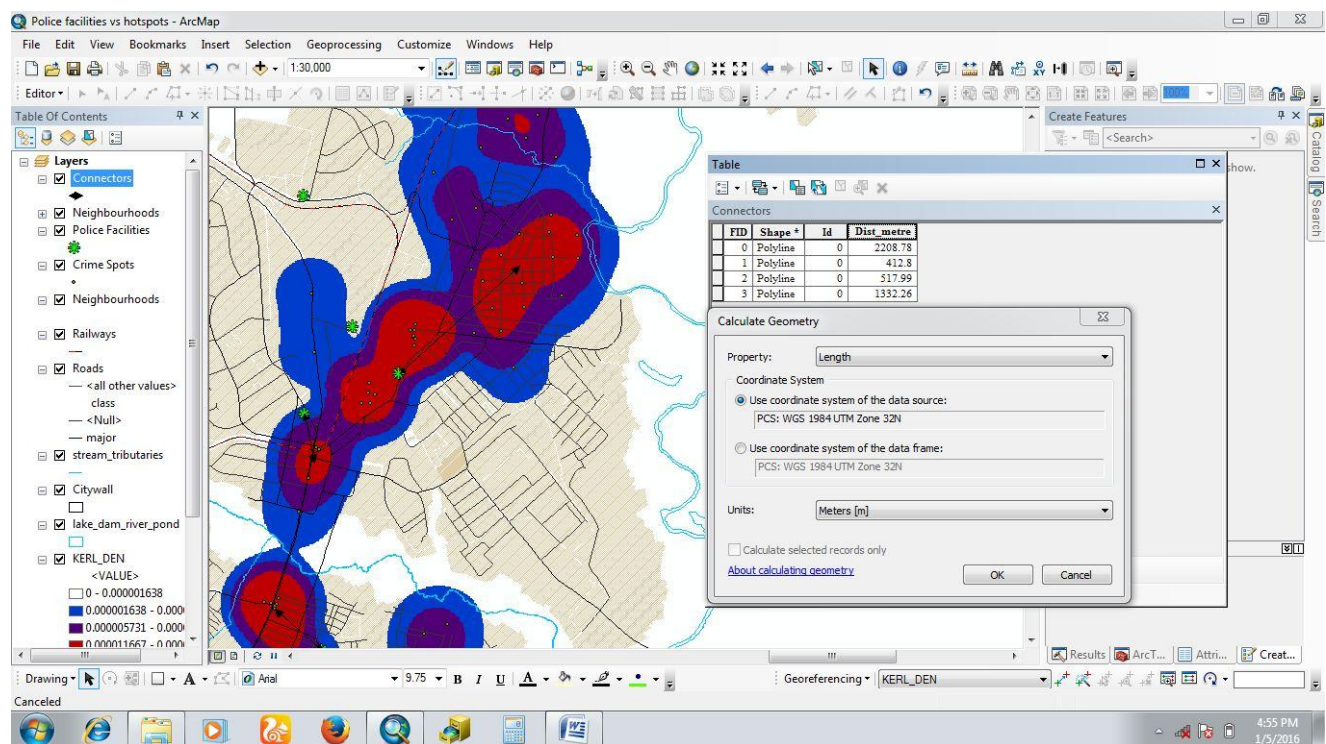
Buffer analysis of Police Stations in relation to crime spots in Zaria metropolis according to international standards (1.5 km radius). To pave way for law makers in collaboration with police crime department in Kaduna state, to site police station(s) or post in those disadvantaged areas of Zaria metropolis to enhanced crime management (See Fig. 4.6). International standard stipulate that, residents should not travel longer than 1.5km to access police facilities.

From the 1.5km radius buffer analysis displayed in figure 4.6 it can be observed that neighbourhoods like Bomo village, Hayin Dogo, Palladan, Kabama, Unguwan Yusi, Hayin Ojo, Nagoyi, Gaskiya and Tukur Tukur Layouts are out of coverage. This means that these Neighbourhoods do not have easy access to the available police facility meaning that police station/post should be located in these disadvantage areas to reduce rate of criminal activities in the areas



4.7.2 Calculated Geometry Distance from Crime Hotspots to Nearest Police Station in Zaria Metropolips

It was observed from analysis done using the calculated *geometry tool* of ArcGIS that, the distance from crime hotspots to the nearest police facility is 2208.78m for Hayin Dogo, 1332.26m in Sabon Gari, 518m for Tudun Wada and 412.8m for the PZ axis. Commercial areas like Sabon Gari Main market and Sheikh Ladan Shehu market in Zaria city have a police station and post respectively in the hotspots region as such can hardly be measured. See plate 4. The implication is that, areas far from the standard distance (1.5km) normally have high crime rate, except for Central Business District (CBD) i.e Sabon Gari area.



Calculated geometry distance from crime hotspots to nearest police station in Zaria Metropolips

4.8 FACTORS RESPONSIBLE FOR CRIME IN ZARIA METROPOLIS

In an attempt to identify the factors causing crime in the study area, Nigerian Police, DSSS, 93 Military Intelligence Zaria, Vigilante Leaders, Local Chiefs and selected youths were interviewed. Similarly, in the researcher's quest to actualize this sixty persons were interviewed and are drawn from the five urban districts. Equal numbers of respondents (12) were drawn from each urban district for fair representation. However, the following variables were investigated; Drug Abuse, Illiteracy, poverty, Weak law enforcement, Parenting, lack leadership in the community, High population turnover, Political condition, unemployment, Lack of integration in family structure, etc. (see interview guide in appendix A. Various reasons were given for occurrence of crimes in Zaria, primarily related to the following:

2

4.8.1.1 Economic situation

The major economic factors that contribute to the crime initiations are poverty, unemployment and political situation. Poverty, inequality, financial crisis due to poverty can cause person to involve in criminal activities. A poor father may not afford to educate his children and lack of education may lead to criminal thinking. Homelessness causes the children to spend most of the time on streets making them vulnerable to crime.

4.8.1.2 Unemployment

Lack of employment opportunities result to criminal activities amongst the unemployed. An unemployed person needs to run his household by any means and when he doesn't find any legal opportunity to earn a living; he might get involved in criminal activities to finance his living.

4.8.1.3 Political Conditions

Due to political uncertainty, sense of insecurity develops among members of the society, the sense in which they become hopeless of their futures because, the people whom they entrusted their mandates (the politicians) involved themselves in an unfair means of accumulating wealth. Similarly, politicians have turned quest for power to a do or die affair, involving themselves into criminal activities such as: Assassination of opponents, Intimidation, Assaults, used of thugs to cause confusion in the opponent's strong holds which often times lead to mayhem in the society among others.

4.8.1.4 Social factors

Lack of Integration: Okah (2003) observed that weak bonds or a tie within the society resulting in lack of integration has been identified as the cause of cultism and crime. Similarly, Okah (2003) quoted Odili in the Tide newspaper of 13th August 2002 as saying that groups that do not become integrated into conventional society may violate the law because they feel alienated to the conventional order that established it. It therefore follows that people who are close to the conventional groups may find it difficult to deviate from the establishment rules. When one is not fully integrated, the tendency to deviate becomes obvious and its result is crime of varying degrees. Owing to the explanation above, it's obvious that, our social structure mirrors to citizens and communities what we value and how we set priorities. Social environment is needed to be studied with respect to different environmental scenarios laying emphasis on crime committed on that society.

The core Social root causes of crime are Inequality, Lack of support to families and neighborhoods, real or perceived inaccessibility to services, Lack of leadership in communities, Bridge in communication, Difference in religious ideology and Individual well-being, the overexposure to television as a means of recreation to mention just a few.

Social environment is needed to be studied with respect to different social scenarios. For this purpose causes to crime from some of the core parts of the society with whom the youth directly belong are separately explained below.

4.8.1.5 School environment

Below are some notable reasons that permit crimes in most tertiary institutions in Zaria and Nigeria at large:

i. Over Enrolment: It is a common knowledge that in Nigeria, admissions are given to desiring Student(s) without recourse to existing facilities and available infrastructure. The social problem of congestion and frustration which this situation engenders, become a breeding ground for stealing cheating, violence and all forms of anti-social behaviours in our schools today.

ii. Poor Learning Environment: The circumstances of our school environment are so bad that hostel and classrooms are either in short supply or the limited ones are in dilapidated conditions. Many of the schools lack teaching aids like textbooks, library and laboratory equipment, furniture, workshops, note books for lesson plans are even in short supply. The results of these are that, teachers are obviously incapacitated in the discharge of their duties. The students on their part are not adequately prepared to face any examination thereby making all kind of crimes inevitable in our schools and by extension constitute nuisance in our society instead of sanity.

iii. Admission of Unprepared Students: The quest for certificate has led many parents to force their Children to school even though the children are not prepared and disposed to attend such schools. Students, who have intrinsic disaffection for education, turn out as nuisance in their schools. They become problems not only to themselves, other students, and the entire school community and by extension the host community. They easily resort

to fighting, violence and contribute to perpetuate all manner of crimes in the school and the community at large.

The Disposition to Study a Particular Course: Most parents send their children to school directing them to focus or pay attention to a particular course. The penchant by parents to have their children read medicine, law, engineering, accounting etc. has led many children to indulge in all forms of crimes to satisfy the expectations of their parents even though they may not be Clinically fit to study those courses in most cases those category of students end up dropping out of school and when all hope is lost prostration set in, they find themselves into one type of crime or the other in and outside the school environment.

iv. Strike by Teachers/lecturers: The lingering problems on the issue of remuneration between teachers and government have contributed greatly to the increasing wave of crimes in our schools and by extension the society. Often time teachers/lecturers embark on strike and would stay for as long as their demands are not met. Even when these strikes are called off students are the worst hit. Most time, course outlines are not covered and when they are rushed, students are psychologically indisposed to pass such examinations. They resort to crime to be able to pass and when that is not achieved they end up joining one gang or the other to cause mayhem in and outside the school environment.

v. Cult Activities in School: cultism and cult related issues have become a hydra headed monster which seeks to destroy the very fabric of peace and tranquility that characterize teaching and learning in any institution. Amaele (2006) described cultism as a social crime which has become common practice in our schools: primary, secondary and tertiary schools. This is why Maguetin Amaele (2006) reiterated that, cultism is a fraternity established by a conjunction of purposeful intention to achieving narrow ends and the consequences of this always fall back to society.

The intentions of the cultists are usually to cause harm, maim and to destroy lives and property on campuses. Egbezor (2002) observes that cultist have become notorious because they have become associated or identified with unwholesome behaviours such as drug abuse, clashes amongst themselves and others and nocturnal meetings and activities. Cult and cult related activities abet and perpetuate crimes of varying dimensions. Lamenting on the menace of cultism in schools Wokocha (2007) declares that students keep dying, they keep getting maimed and disfigured, they keep being sexually harassed and the orgy goes on. If only government can stop this madness. If only the school authorities can confront the devil. If only the lives of students can be protected from the blood thirsty occult confraternities. However, corroborating the above statement Okah (2003) observed the recent reports of rapes and day-light killings of students by members of the cults in Nigerian Universities, polytechnics and colleges of education have confirmed that they have gone out of control and carryout all sorts of atrocities with impunity. Cultists do not mean well for our schools because, all kinds of crimes, stealing examination malpractices, killings of teachers and fellow students etc. These atrocities are opposed to civilized behaviours globally because means no good the school and the society in general.

4.8.1.6 Community environment

Major causes of crime related to community environment are related to lack of cohesion, disorganization and neglect especially the Youth in the society as recorded by Youth Justice Board (YJB) *Research Note No.5 2002*. This really paved way for some of the crime committed in our society today as listed below:

i. Fighting: This is a common characteristics found in youth in an effort to primitively express their grievance and assert their superiorities on perceived enemies. Many youth end up quarreling or disagreeing, which results in bulling, flogging and sometimes

beating, in whatever guise fighting is carried out it is the most uncivilized and primitive way of settling scores or differences.

ii. Parenting: Work or labour is recognized as a human right in article 23 (1) of the 1948 United Nations universal declaration of Human Rights. Labour helps for the conservation and development of man and his welfare. Parents who are not doing any form of work to earn a living therefore endanger the dignity, peace and welfare of the entire household. Federal office of statistics discovered that about 71% of Nigeria's household were poor, about 26% were core poor, and about 35% were moderately poor (Wokocha 2007). The negative effect of this is that families under this condition lack access to good food, proper shelter, clean water, good health and healthy inter personal social relations. Many children of these homes become vulnerable and prone to crime that manifest severally in stealing, cheating, violence, truancy etc.

iii. Vandalism: This means willful destruction of valuable property or assets in our societies as a result of unfounded demands or grievances by disloyal youth. Oxford Advanced Learners Dictionary (6th edition) (2000) defines vandalism as the crime of destroying or damaging especially public property. Vandalism is therefore a deliberate destruction of property especially public property.

iv. Illiteracy: Illiteracy and crime are closely related this implies that some people are lured in to crime unknowingly to them because of their level education for instance well to do persons in the society mostly make used of illiterate on the street to achieve their goal and dump them at the mercy of law enforcement agencies. Similarly illiteracy is a common factor of crime identified in the study area because almost all the crime hotspots

visited complained bitterly about the level of dropout thereby constituting high percentage crime recorded in those areas.

v. Drugs abuse/misused: Studies have made us to understand the various ways that drugs and crime are related. For instance crime against the person such as robbery or sexual assaults clear examples of drug-related crime, which is evident in many parts of Nigeria and Zaria, is not exempted.

The various kinds of links between drugs and crime that may explain the coincidence of these two behaviours, for instance the types of crime associated with the legal status of certain drugs are discussed, including possession, production and purchase of illegal drugs all of which are indictable offences. Three theoretical models, originally proposed by Goldstein to explain the drugs-violence nexus in the United States, are then examined; these models have since served as a framework to analyze the relationship between drugs and crime. The first model suggests that crime is linked to the psychopharmacological effects of certain drugs; in other words, it refers to intoxication by drugs which are recognized as undermining judgment and self-control, causing paranoid thoughts or distorting inhibitions and perceptions. The second model refers to economic-compulsive crime and suggests that drug users commit crimes in order to get money to buy drugs. Thirdly, the systemic model suggests that crime among illegal drug users is linked to the drug market. Goldstein acknowledged that this tripartite conceptual framework represents possible relationships between drugs and violence and that many other factors may contribute to a person's drug use and criminal activity.

vi. High population turnover: Over population is a situation where number of people in a given locality overwhelms the resources of that locality. Owing to this definition it's obvious that pressure will be mounted on the little resources, in that situation common

language in that locality becomes survival for the fittest which is not healthy for any society and often time leads to crime. Meaning that, the weaker ones in the society will resort to illegal ways to earn a living.

vii. Corruption in the law enforcing agencies: The senior officers have diverted resources made for running the institution in to their personal pockets for selfish interest. For instance money allocated to purchase equipment is diverted in to the account of individuals for instance; in Nigeria former Inspector general of police (Tafa Balogun) diverted the money for police welfare for personal use. Also, allowances for junior staff is diverted above all funds approve by government to build decent accommodation for staff and other incentives are embezzled by those in position of authority for personal use.

viii. Weak Law Enforcing Agencies: Because Corruption has eaten deeply in to the fabric of our law enforcement agencies especially those charged with responsibilities of maintaining law and orders (so-call senior staff) has involved themselves in dubious practices there by making them to losing grip of their subordinates, a such that has made them ineffective in their discharge of duty. Lack competence, it's obvious that due process is not followed in promotion and assigning of responsibilities instead; sectionalism, fanaticism, nepotism, and tribalism are use as a yardstick for assigning those that would manage sensitive position of authorities to the detriment of the society. Because those who are given the mantle of authority are really not qualified and the qualified ones will become reluctant and discourage in carrying out their responsibilities as expected of them.

4.8.1.7 Family structures

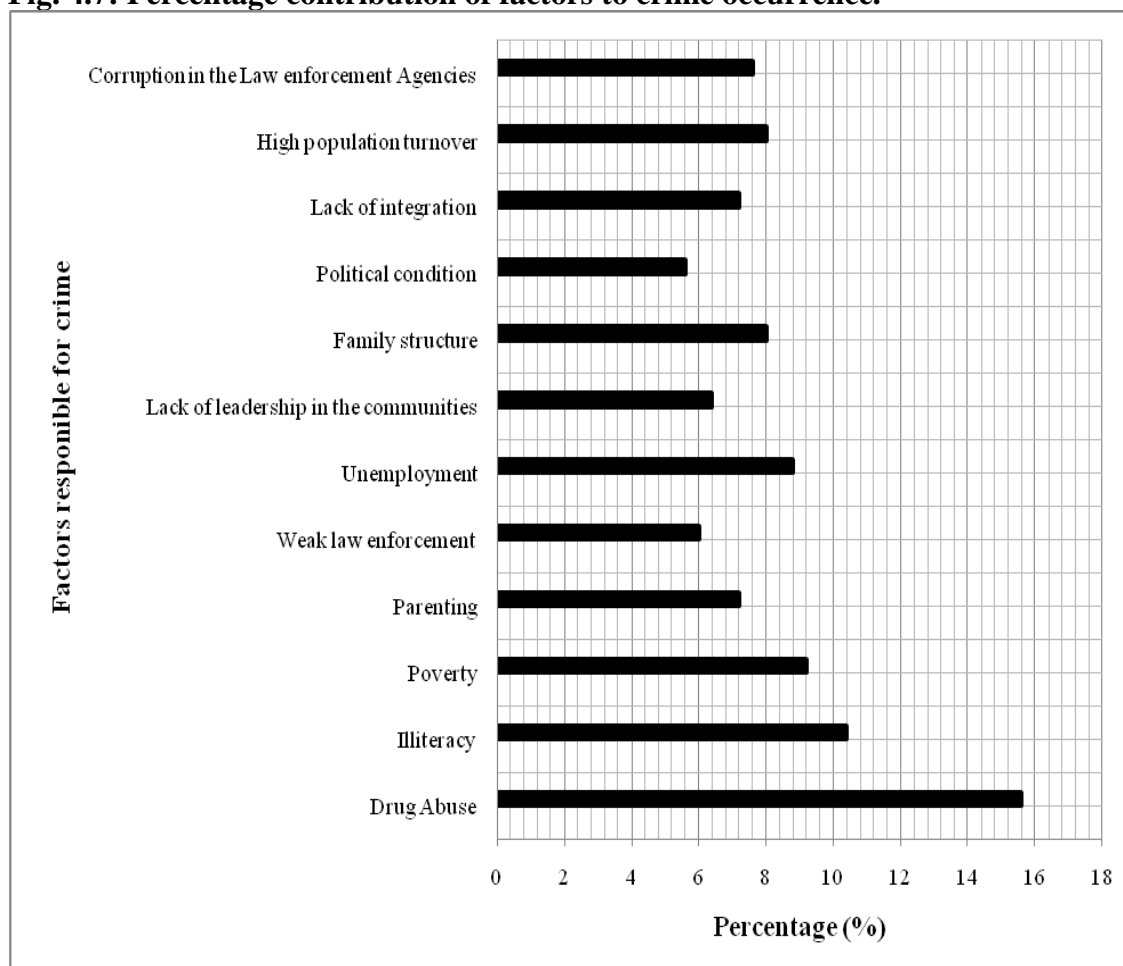
Every community is a product of families therefore a well structured family will bring forth good society with less crime related cases while un-structured families constitute

high rate of crime. However studies have made us to understand that, Youth whose family have one or more characteristics listed below, are more likely to be involved in crime. Egbezor (2002).

- i. Parents involved in crime
- ii. Poor parental supervision
- iii. Their parents neglect them, there is erratic discipline or they are treated harshly
- iv. Family income is low or they are isolated
- v. Family conflict.
- vi. Lack of communication between children and parents.
- vii. Lack of respect and responsibility amongst family members
- viii. Abuse and neglect of children
- ix. Family violence
- x. Family Breakup

Fig. 4.7 reveals that 16.67% of crimes in the study area were attributed to drug abuse, 10.00% was due to Illiteracy, poverty accounts for 8.33% and unemployment also takes a share of 8.33%. Family structure, High population turnover, Corruption in the Law enforcement Agencies and Parenting accounts for 8.33% each of the crimes committed in the study area. (See fig 4.7)

Fig. 4.7: Percentage contribution of factors to crime occurrence.



Source: Field Survey, 2015.

4.8.1.8 Residents' level of satisfaction with the way the police handle crime

From the table 4.8 it would be observed that majority of the residents in Zaria Metropolis are unsatisfied with the way the police handles crime related issues. About 56.67% of the respondents are not satisfied with the frequency of police patrol in their respective neighbourhoods especially those prone to crime or where crimes are highly committed and reasons were attributed to irregular police patrol and lack of total coverage of all parts of the neighborhood especially crime hotspot zones. As regards police response time to distress call, 50% of the respondents acknowledged that the police are usually late to crime scenes.

Table 4.6 Residents' Level of Satisfaction with the way the Police handles Crime

Frequency of police patrol in Neighbourhoods			
General satisfaction	No. of respondents	Percentage (%)	Reason(s) for dissatisfaction
Satisfactory	23	38.33	(a) police patrols are not regular
Unsatisfactory	34	56.67	
No idea	3	5.00	(b) not all parts of the neighbourhoods are covered especially crime hotspots zone
Total	60	100	
Police response time to distress call			
General satisfaction	No. of respondents	Percentage (%)	Reason(s) for dissatisfaction
Satisfactory	26	43.33	(a) the police are usually late to crime scenes
Unsatisfactory	30	50.00	
No idea	4	6.67	
Total	60	100	

Source: Field Survey, 2015.

4.9 MANAGEMENT STRATEGIES OF CRIMES IN ZARIA

In the course of interview conducted on types of crime, factors responsible for crime growth, frequency of crime occurrence, time of committed crime in Zaria metropolis with the interviewee, they were also asked to suggest in their opinion way(s) towards managing crimes in Zaria. Interestingly, vital points were given:

4.9.1 Managing Drug Abuse as the Major factor of Crime

The crime records obtained from law enforcement agencies revealed that drug abuse among other contributing factors of crime has plagued all the nooks and cranny of Zaria

metropolis making it prominent among other factors. (See Appendix B and Table 4.3). However, to manage drugs related crimes the following strategies must be considered.

i. Community Policing

The police force continues to be on the first line of defense against crime and drugs. The more we link law enforcement with local residents in positive ways that create trusting relationships, the more secure our communities will be. It's however observed that in Nigerian the police cannot do it alone therefore Community Oriented Policing Services (COPS) program to support the police officers will go a long way in curbing the menace of drug related crimes. In view of this the strength of the COPS program should be emphasized on long-term bases and innovative approaches to community-based problems should be at the fore front. This program will reinforce efforts toward reducing the incidence of drug-related crime.

ii. Coordination between Law Enforcement Agencies

Coordination between law enforcement agencies will improve the efficiency of individual counter-drug efforts. By increasingly reinforcing one another; sharing information and resources; removing conflicts between operations, establishing common priorities, and focusing energies across the spectrum of criminal activities will increase our overall capabilities of managing crime will be increased. Various federal, state, and local agencies should join forces on national as well as regional levels, to achieve better results. The federal government should provide extensive support to state and local law enforcement agencies through the Local Law Enforcement Assistance Program, grants, support of multi-jurisdictional task forces, and other activities dealing with drug abuse and violent crime.

iii. Targeting Gangs

Initiatives for targeting gangs goes a long way in reducing drug trafficking. Gangs are active in drug-distribution chains operating in various parts of our cities. The Drug Enforcement Administration should increase efforts to break up trafficking organizations, Task Forces to address drug related crime and focus will be on armed traffickers through the Achilles or vulnerable point to oversee where drug-related violence is severe.

iv. Breaking the Cycle of Drugs and Violence

The correlation between drugs and crime is well established. Drug addicts are involved in approximately three to five times the number of crimes arrestees who do not use drugs. Virtually all reported crime in the study area is related to substance abusers. Simply punishing drug-dependent criminals is not enough. If crime is to be reduced permanently, addiction must be treated. Treatment while in custody, in prison, and under post-incarceration or release supervision can reduce recidivism by roughly 50 percent.

v. Strengthening the Enforcement Agency

Certain strategies have to be put in place to gear up law enforcement agencies to properly tackle and manage crime in our communities. To achieve this, the following departments must be created and empowered to properly handle certain criminal issues: department of criminal behaviour analysis, department of field professional development, department of investigation support, and department of research& intelligence support.

The Criminal Behavioral Analysis Team and Local Area Command investigators should work toward Criminal Profiling. This will include, but not be limited to, Crime Scene Interpretation, Investigative Strategies, Indirect Personality Assessment, Case Linkage Analysis, Threat Assessments and Undercover Strategies but to be extended to all related cases.

The Field Professional Development Team consists of specially trained officers and men primarily charged with assisting Local Area Commands in Crime Management. Their functions will include working with relevant agencies in identifying and assisting “at risk” location. They provide ongoing support to Crime Management Unit’s through evaluation of their systems processes and tactical and strategic approach to crime. They also have key crime category responsibilities, i.e. Break, Enter and Steal, Robbery, Assault, Motor Vehicle Theft or Stealing. These teams also conduct Professional training for investigators and other specialist police, and are charged with specific projects as determined by the Commander.

The Investigation Support Team lends expertise and assistance to all areas of criminal investigation by providing up to date information on external specialists via the Experts Database. This team is actively involved in assisting police in “case write up” of successful investigations. The Team also will dedicate officer who has carriage of the analysis of historical cases, assessing the viability of exposing old exhibits to latest DNA technology.

The Research and Intelligence Support Team core function is to investigate latest Crime Management strategies from a worldwide base, utilizing Internet technology and printed material from newspapers and journals as well as local, national and international networks.

vi. Preventing Corruption in law enforcement agencies

Preventing corruption in law enforcement agencies is one way of managing crime. There are few fundamental ideas that can be implemented that can, by their very nature, curb

corruption in the law enforcement agencies. The three areas that need attention are: training, personal characters, and the incentives program as listed below.

- *Training:* Training and retraining is one of the vital ways of managing corruption in law enforcement agencies it's obvious that a well trained security operatives will always be mindful of the does and don't in their lawful duties this implies that security operatives should be given special training in regards to tropical issues like integrity and ethics this will go a long way towards managing the menace of corruption in the law enforcement agencies.
- *Personal Characters:* People eye the police and their behaviour constantly being the people saddled with responsibly of maintaining laws and orders as such should as a matter of fact maintain good reputations; by so doing people around them will immolate them and learn to be good citizens that will go a long way in managing crime in and around them. For instance if a police officer, who is the pillar of the law, can do it, his/her credibility vanishes.
- In a nutshell it's expected that all security operatives should display good character to enable them to manage criminal issues in our community.
- *The Incentive Program:* The Incentive Program should be put in place to revamp the morale to security operatives, meaning that government should come up with plans towards improving the well being of security operatives to enable them carryout their duties with utmost responsibility. This is one area where security operatives delve in to negative attitude because it's often said that a hungry man is an angry man. Therefore the researcher is of the opinion that the only way to manage crime effectively is to take issues regarding crime management paramount.

Vii. Managing Population Turnover

To proffer solution for the management of population turnover as one of the contributing factors of crime, four key concepts are hereby discussed ranging from better education, family planning, sex education and concession.

➤ Better Education

One of the first measures is to implement policies reflecting social change. Educating the masses helps them understand the need to have one or two children at the most. Families that are facing a hard life and choose to have four or five children should be discouraged. Family planning and efficient birth control can help in women making their own reproductive choices. Open dialogue on abortion and voluntary sterilization should be seen when talking about overpopulation.

➤ Family Planning

As population of this world is growing at a rapid pace, raising awareness among people regarding family planning and letting them know about serious after effects of overpopulation can help curb population growth. One of the best ways is to let them know about various safe sex techniques and contraceptives methods available to avoid any unwanted pregnancy.

➤ Concessions

Government should map out policies related to tax exemptions to curb overpopulation. One of them might be to waive off certain part of income tax or lowering rates of income tax for those married couples who have single or two children. As we humans are more inclined towards money, this may produce some positive results.

Vii. Knowledge of Sex Education

Imparting sex education to young kids at elementary level is a must. Most parents feel shy in discussing such things with their kids who result in their children going out and look out for such information on internet or discuss it with their peers. Mostly, the information is incomplete which results in sexually active teenagers unaware of contraceptives and embarrassed to seek information about same. It is therefore important for parents and teachers to shed their old inhibitions and make their kids or students aware of solid sex education.

Viii. Community leadership as a contributing factor of crime

In recent times community leaders have lost grip of their followers making their community vulnerable to all kinds of crimes, however, one way to restore lost glory of our community leader is that, government should enact law(s) to empower them to arrest and discipline criminals in their locality. Similarly government and NGOs should give financial support to community leaders to enable them sort internal machineries for information gathering in areas of criminal activities if this is strictly followed crime will be the thing of the past.

Another way of revamping community leaders to manage crime is through designing programme to assist them collaborate with other youth-serving agencies to develop an integrated system of services designed to manage crime.

ix. Illiteracy as a contributing factor of crime

Uneducated person is as good as blind man therefore the only remedy to illiteracy is education meaning that to manage illiteracy laws must be put in place to punish parent who failed to send their children/wards and wards to school. In the other hand children who failed to go to school even when their parent paid for their school fees should be

arrested and made compulsory to go school without compromised. Finally government on their part should made education free and compulsory to certain level.

x. Unemployment/Poverty as contributing factors of crime

Education curriculum must be immediately revised to incorporate skills acquisitions exercise, Entrepreneurship Development, and enterprise to limit the rate of paper works. A special program should be designed for low-skilled youth in vocational centres. Incentives should be provided to promote student internships. The current state of youth unemployment in Nigeria and the rest of Africa require shared responsibilities to tackle it. It will take our combine efforts to solve it. Businesses will thrive in a safe and secure society. Government can implement developmental programs only in an atmosphere of peace of security. It is therefore incumbent on government to work closely with the private sector to promote internships, graduate trainee programmes, and community-based projects that create jobs for young people.

Agriculture is a viable source of investments for young people if it is made attractive. There should be a swift transition from subsistence to commercialized farming. Farm and non-farm activities should be better packaged to make them really attractive. There should also be adequate investment in rural education. This will boost rural opportunities and reduce rural-urban migration and its concomitant challenges. If these are judiciously done cases of unemployment and poverty will be the thing of the past and criminal activities will reduced drastically.

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1 INTRODUCTION

This chapter highlights a summary of the study, its conclusions and recommendations.

5.2 SUMMARY OF FINDINGS

Crimes are very rampant in areas like Sabon Gari, PZ, Tudun Wada, Kusfa, Hayin Ojo and Hayin Dogo neighbourhoods. Other areas like Chikaji, Muchia and Kofar Doka are other crime prone areas with considerable number of cases reported. The buffer analysis reveals that neighbourhoods like Bomo Village, Hayin Dogo, Kabama, Unguwan Yusi and Nagoyi amongst others are out of coverage to accessing police facilities. It was observed from analysis done using the calculate geometry tool of ArcGIS that the distance from crime hotspots to the nearest police facility is 2208.78km in Hayin Dogo, 1332.26m in Sabon Gari, 518m in Tudun Wada and 413m in the PZ axis.

The GIS query operations reveal that 43 crimes out of the total crimes recorded happens during the day while 76 crimes are committed at night. 36.13% of the crimes happen during the day while 63.87% of the crimes happen at night. Night crimes are more prominent in neighbourhoods like Sabon Gari, Muchia, Hayin Ojo, Hayin Dogo, Kusfa, Tudun Wada and Gyellesu. The query operation also reveals that Sabon Gari urban district has the highest number of night crimes with a total of 31 counts followed by Tudun Wada and Samaru urban districts with 19 and 13 counts respectively. GRA has the lowest night crime with a count of 1 recorded case. As regard crimes committed during the day, Sabon Gari urban district has 20 counts which is the highest followed by Tudun Wada urban district with 10 counts. GRA has the least number of day crimes with only 1 count.

Majority of the residents in Zaria Metropolis are unsatisfied with the way the police handle crime related issues. About 56.80% of the respondents are not satisfied with the frequency of police patrol in their respective neighbourhoods especially those prone to crime or where crimes are highly committed and reasons were attributed to irregular police patrol and lack of total coverage of all parts of the neighborhood especially crime hotspot zones. As regards police response time to distress call, 51.20% of the respondents acknowledged that the police are usually late to crime scenes.

About 16.67% of crimes in the study area were attributed to drug abuse, 10.00% was due to Illiteracy, poverty accounts for 8.33% and unemployment also takes a share of 8.33%. Family structure, High population turnover, Corruption in the Law enforcement Agencies and Parenting accounts for 8.33% each of the crimes committed in the study area.

5.3 CONCLUSION

Based on the findings of this research, it was concluded that, virtually all types of crime occurred in Zaria metropolis and most crimes in Zaria are committed in the night. Sabon Gaari, PZ, Tudun wada, and Hayin Dogo are hotspots, consequently, Bomo Village, Hayin Dogo Palladan, Kabama, Unguwar Yusi, Hayin Ojo, Gaskiya and Tukur Tukur are located far away from police stations so need one each. The research findings also revealed that, Drug abuse, Illiteracy, poverty, and unemployment are the major causes of crime in Zaria metropolis. Finally respondents are not satisfied with the response of police to crime scene and distress calls in Zaria metropolis.

5.4 RECOMMENDATIONS

Sequel to summary of findings the following recommendations are hereby suggested for proper management of crime in Zaria metropolis.

i. Good community leadership: In recent times community leaders have lost grip of their followers making their community vulnerable to all kinds of crimes, however, one way to restore lost glory of our community leader is that, government should enact law(s) to empower them to arrest and discipline criminals in their locality. Similarly government and NGOs should give financial support to community leaders in Zaria Metropolis to enable them sort internal machineries for information gathering in areas of criminal activities if this is strictly followed crime will be the thing of the past.

Another way of revamping community leaders to manage crime is through designing programme to assist them collaborate with other youth-serving agencies to develop an integrated system of services designed to manage crime in Zaria metropolis.

ii. Creating job opportunities: Education curriculum must be immediately revised to incorporate skills acquisitions exercise, Entrepreneurship Development, and enterprise to limit the rate of paper works. A special program should be designed for low-skilled youth in vocational centres. Incentives should be provided to promote student internships. The current state of youth unemployment in Zaria and Nigeria at large require shared responsibilities to tackle it. It will take our combine efforts to solve it. Businesses will thrive in a safe and secure society. Government can implement developmental programs only in an atmosphere of peace of security. It is therefore incumbent on government to work closely with the private sector especially those in Zaria metropolis to promote internships, graduate trainee programmes, and community-based projects that create jobs for young people in Zaria metropolis.

Agriculture is a viable source of investments for young people if it is made attractive. There should be a swift transition from subsistence to commercialized farming. Farm and non-farm activities should be better packaged to make them really attractive. There should also be adequate investment in rural education. This will boost rural opportunities and reduce rural-urban migration and its concomitant challenges. If these are judiciously done cases of unemployment and poverty will be the thing of the past and criminal activities will be reduced drastically in Zaria metropolis.

iii. Encouraging literacy: Uneducated person is as good as blind man therefore the only remedy to illiteracy is education meaning that to manage illiteracy in Zaria metropolis Kaduna state government must be put in place laws to punish parent who failed to send their children/wards to school. In the other hand children who failed to go to school even when their parent paid for their school fees should be arrested and made compulsory to go school without compromised. Similarly, Kaduna state government should made education free and compulsory to certain level.

iv. Tackling drug abuse: Drug abuse among other contributing factors of crime has plagued all the nooks and cranny of Zaria metropolis. However, to manage drugs related crimes the following strategies must be considered.

- **Community Policing:** The police forces continue to be on the first line of defense against crime and drugs. The more we link law enforcement with local residents in positive ways that create trusting relationships, the more secure our communities will be. It's however observed that in Nigerian the police cannot do it alone therefore Community Oriented Policing Services (COPS) program to support the police officers will go a long way in curbing the menace of drug related crimes.
- **Coordination between Law Enforcement Agencies:** Coordination between law enforcement agencies will improve the efficiency of individual counter-drug

efforts. By increasingly reinforcing one another; sharing information and resources; removing conflicts between operations, establishing common priorities, and focusing energies across the spectrum of criminal activities will increase our overall capabilities of managing crime.

- ***Targeting Gangs:*** Initiatives for targeting gangs goes a long way in reducing drug trafficking. Gangs are active in drug-distribution chains operating in various parts of our cities. The Drug Enforcement Administration should increase efforts to break up trafficking organizations, Task Forces to address drug related crime and focus will be on armed traffickers through the Achilles or vulnerable point to oversee where drug-related violence is severe.
- ***Breaking the Cycle of Drugs and Violence:*** The correlation between drugs and crime is well established. Drug addicts are involved in approximately three to five times the number of crimes arrestees who do not use drugs. Virtually all reported crime in the study area is related to substance abusers. Simply punishing drug-dependent criminals is not enough. If crime is to be reduced permanently, addiction must be treated. Treatment while in custody, in prison, and under post-incarceration or release supervision can reduce recidivism by roughly 50 percent.
- ***Preventing Corruption in law enforcement agencies:*** Training and retraining is one of the vital ways of managing corruption in law enforcement agencies it's obvious that a well trained security operatives will always be mindful of the does and don't in their lawful duties this implies that security operatives should be given special training in regards to tropical issues like integrity and ethics this will go a long way towards managing the menace of corruption in the law enforcement agencies.

People eye the police and their behaviour constantly being the people saddled with the responsibility of maintaining laws and orders as such should as a matter of fact maintain good reputations; by so doing people around them will imitate them and learn to be good citizens that will go a long way in managing crime in and around them. For instance, if a police officer, who is the pillar of the law, can do it, his/her credibility vanishes. In a nutshell it's expected that all security operatives should display good character to enable them to manage criminal issues in our community.

Incentive Program should be put in place to revamp the morale to security operatives, meaning that government should come up with plans towards improving the well being of security operatives to enable them carryout their duties with utmost responsibility. This is one area where security operatives delve in to negative attitude because it's often said that a hungry man is an angry man. Therefore the researcher is of the opinion that the only way to manage crime effectively is to take issues regarding crime management paramount.

v. Employment of GIS in crime management: Crime data should be made available as well as training of relevant agents in crime mapping and management should be encourage to aid decision making process, once the law enforcement officers are taught spatial techniques of crime hotspots management, it will assist them in performing spatial analysis functions queries to display crime prone areas in order to maximize available resources to abate crime.

vi. Provision or more police post: The buffer zones generated shows that the location of the police Divisional Head Quarters at Zone C is not located where it can serve the entire area optimally; therefore, more police post should be made functional in some crime prone areas such as Makwalla, Kusfa and Unguwar Nupawa. Also neighbourhoods like Kabama, Tukur-tukur and Gaskiya Layouts should be provided with police posts.

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APPENDIX A:

INTERVIEW GUIDE

1. What are the various categories and types of crime committed in your area?
2. At what time are these crimes committed?
3. How often are these crimes committed?
4. What is the response level of the security operatives to distress calls?
5. What are the factors responsible for crime occurrence in your area?
6. What is your level of satisfaction in the way police handles crime in your area?

APPENDIX B:

4.1 Reported cases of crimes in Zaria Metropolis (2011 - 2015)

Location	Crime_Type	X_Coordinate	Y_Coordinate	Urban_Sect	Time_Occur
Angwan Tabo	Prostitution, intimidation, drug abuse, rape, assault	353481.17	1234154.44	Samaru	Day /Night
Tofu Road, Palladan	Intimidation and drug abuse	356984.01	1231768.57	Samaru	Day/Night
Conan Beye	Rubbery	342573.77	1235474.45	Samaru	Night
Agric Tank, Bomo	Intimidation, thefts and prostitution	351623.35	1235138.63	Samaru	Day/Night
Tomatoe Market S/Gari	Drug abuse, assault, thefts and others	361087.80	1228691.96	S/Gari	Day/Night
Hayin Mal. Zango	Burglary, theft and drug abuse	355185.37	1231330.84	Samaru	Day/Night
Muciya	Assault, intimidation and drug abuse	361597.53	1229700.93	S/Gari	Day/Night
Tsugugi, S/Gari	Drug abuse, assault, intimidation, rape, rubbery and others	362433.08	1229288.71	S/Gari	Day
Marmara, S/Gari	Assault, drug abuse, intimidation, rape, homicide and others.	361979.19	1229079.29	S/Gari	Day/Night
Timber Sheet, S/Gari	Intimidation, thefts, drug abuse and others	360718.84	1228092.5	S/Gari	Day/Night
Agro	Assault, drug abuse, rape, intimidation, homicide and others	359905.57	1226437.08	Tudun Wada	Night
Kofan Doga	Intimidation and others	359100.75	1225055.13	Tudun Wada	Day
Babban Dodo	Drug abuse, assault and others	358783.32	1222820.91	Zaria City	Day/Night
Hayin Ojo	Assault, drug abuse, intimidation and others	362103.24	1230466.44	S/Gari	Day
Layin	Theft, drug abuse,	360112.98	1225954.5	Tudun	Night

Musa Gwarzo	prostitution			Wada	
Kwantretia	Drug abuse, assault and others	361244.26	1230650.68	S/Gari	Day
Dogon Bauchi	Drug abuse, rape and others	361805.29	1228680.10	S/Gari	Day
PZ	Intimidation theft and others	360254.91	1227619.08	S/Gari	Day
Makwala, Zaria City	Assault, drug abuse, intimidation and others	357946.96	1221747.38	Zaria City	Night
Dogarawa	Theft, assault and others	360629.8	1231392.17	S/Gari	Day
Gaskiya Layout	Drug abuse, prostitution and theft	35881853	1226551.71	Tudun Wada	Day
Turkur-Tukur	Intimidation, theft and prostitution	357557.74	1226117.69	Tudun Wada	Night
Bakin Dogo	Intimidation, drug abuse and assault	361676.49	1230805.99	S/Gari	Night
Layin Dan Dutse	Theft and others	360012.97	1225502.06	Tudun Wada	Night
Nagoyi	Theft and burglary	364563.74	1225249.22	Tudunb wada	Day
Gyellesu, Bini Doti Street	Prostitution, intimidation and others	361279.00	1225998.76	Tudun Wada	Night
Dakaci	Drug abuse, intimidation, theft	363989.16	1225277.94	Tudun Wada	Day
Remin Kambari	Assault and others	358457.77	1221816.98	Zaria City	Night
Kwarbai	Assault, drug abuse and intimidation	3593228.98	1223301.32	Zaria City	Night
Limincin Kona	Others	357617.43	1222027.01	Zaria City	Day
Angwan Nupawa	Theft, drug abuse	357964.40	1222139.32	Zaria City	Night
Husseniya	Intimidation	360236.56	1228992.71	GRA	Day
Round-about Area	Intimidation	360131.89	1227194.65	S/Gari	Day

Source: Oral interview

APPENDIX C:

This was achieved by entering the data obtained from the police and other security operatives into Microsoft Excel and then imported into the ArcGIS environment to create the database for more analysis.

Table 4.5: Spatial Crime Database of Zaria Metropolis

FID	Shape	Id	Location	Crime_Type	X_Coord	Y_Coord	Urban_Sect	Time_occur
0	Point	0	Unguan Tabo	Prostitution	353481.17	1234154.44	Samaru	Night
1	Point	0	Tofu Road, Palladan	Intimidation	356984.01	1231768.57	Samaru	Night
2	Point	0	Kwanan Biye	Robbery	348573.77	1235474.45	Samaru	Night
3	Point	0	Agric Tank, Bomo	Intimidation	351623.35	1235138.63	Samaru	Night
4	Point	0	Tomatoes Mkt S/Gari	Others	361087.80	1228691.96	Sabon Gari	Day
5	Point	0	Hayin Mal. Zango	Burglary	355185.37	1231330.84	Samaru	Day
6	Point	0	Muchia	Assault	361597.53	1229700.93	Sabon Gari	Night
7	Point	0	Tsugugi, Sabon Gari	Drug Abuse	362433.08	1229288.71	Sabon Gari	Day
8	Point	0	Marmara, Sabon Gari	Assault	361979.19	1229079.26	Sabon Gari	Night
9	Point	0	Timber Shed, Sabon Gari	Intimidation	360718.84	1228092.5	Sabon Gari	Night
10	Point	0	Agoro	Assault	359905.57	1226437.08	Tudun Wada	Night
11	Point	0	Kofar Doka	Others	359100.75	1225055.13	Tudun Wada	Day
12	Point	0	Baban Dodo	Drug Abuse	358783.32	1222820.91	Zaria City	Day
13	Point	0	Hayin Ojo	Assault	362103.24	1230466.44	Sabon Gari	Day
14	Point	0	Layin Musa Gwarzo	Theft	360112.98	1225954.05	Tudun Wada	Day
15	Point	0	Kwantresha	Drug Abuse	361244.26	1230650.68	Sabon Gari	Day
16	Point	0	Dogon Bauchi	Drug Abuse	361805.29	1228680.10	Sabon Gari	Day
17	Point	0	Kwanan Biye	Robbery	348529.32	1235443.76	Samaru	Night
18	Point	0	PZ	Intimidation	360254.91	1227619.08	Sabon Gari	Day
19	Point	0	Makwalla, Zaria City	Assault	357946.96	1221747.38	Zaria City	Night
20	Point	0	Dogarawa	Theft	360629.8	1231392.17	Sabon Gari	Day
21	Point	0	Gaskiya	Drug Abuse	358818.53	1226551.71	Tudun	Day

			Layout				Wada	
22	Point	0	Tukur Tukur	Intimidation	357557.74	1226117.69	Tudun Wada	Night
23	Point	0	Bakin Dogo	Intimidation	361676.49	1230805.99	Sabon Gari	Night
24	Point	0	Layin Dandutse	Others	360012.97	1225502.06	Tudun Wada	Night
25	Point	0	Nagoyi	Theft	364563.74	1225249.22	Tudun Wada	Day
26	Point	0	Gyellesu, Bini Doti St.	Others	361279.00	1225998.76	Tudun Wada	Night
27	Point	0	Dakaci	Drug Abuse	363989.16	1225277.94	Tudun Wada	Day
28	Point	0	Rimin Kambari	Others	358457.77	1221816.98	Zaria City	Night
29	Point	0	Kwarbai	Assault	359328.98	1223301.32	Zaria City	Night
30	Point	0	Limancin Kona	Others	357617.43	1222027.01	Zaria City	Day
31	Point	0	Unguwan Tabo	Drug Abuse	353731.78	1234181.89	Samaru	Day
32	Point	0	Unguwan Tabo	Intimidation	353696.32	1234467.90	Samaru	Night
33	Point	0	Unguwan Tabo	Intimidation	353293.62	1234450.18	Samaru	Night
34	Point	0	Unguwan Tabo	Rape	353455.55	1234429.54	Samaru	Night
35	Point	0	Unguwan Tabo	Intimidation	353203.14	1234327.94	Samaru	Night
36	Point	0	Unguwan Tabo	Assault	353257.11	1234280.31	Samaru	Night
37	Point	0	Hayin Mallam Zango	Drug Abuse	354641.89	1231224.60	Samaru	Night
38	Point	0	Hayin Mal.Zango	Theft	354874.73	1231737.89	Samaru	Day
39	Point	0	Tofu Road, Palladan	Drug Abuse	357123.72	1231985.19	Samaru	Night
40	Point	0	Tomatoes Market, S/Gari	Drug Abuse	361098.062	1228740.536	Sabon Gari	Night
41	Point	0	Tomatoes Market, S/Gari	Theft	361052.75	1228694.82	Sabon Gari	Night
42	Point	0	Tomatoes Market, S/Gari	Assault	361093.43	1228616.77	Sabon Gari	Night
43	Point	0	Tomatoes Market, S/Gari	Others	361082.18	1228632.98	Sabon Gari	Day
44	Point	0	Tomatoes Market, S/Gari	Others	361076.89	1228644.55	Sabon Gari	Day
45	Point	0	Tomatoes Market,	Others	361086.55	1228568.29	Sabon Gari	Day

			S/Gari					
46	Point	0	Agric Tank, Bomo	Theft	351727.19	1234997.48	Samaru	Day
47	Point	0	Agric Tank, Bomo	Prostitution	351758.55	1234783.83	Samaru	Night
48	Point	0	Muchia	Intimidation	361249.75	1229997.04	Sabon Gari	Night
49	Point	0	Muchia	Intimidation	361394.21	1229601.75	Sabon Gari	Night
50	Point	0	Muchia	Drug Abuse	361637.10	1230202.89	Sabon Gari	Night
51	Point	0	Tsugugi, Sabon Gari	Assault	362232.03	1229296.86	Sabon Gari	Night
52	Point	0	Tsugugi, Sabon Gari	Intimidation	361948.92	1229487.36	Sabon Gari	Night
53	Point	0	Tsugugi, Sabon Gari	Rape	362210.86	1229646.11	Sabon Gari	Night
54	Point	0	Tsugugi, Sabon Gari	Others	362429.94	1229476.25	Sabon Gari	Night
55	Point	0	Tsugugi, Sabon Gari	Robbery	362200.54	1229499.14	Sabon Gari	Night
56	Point	0	Marmara, Sabon Gari	Drug Abuse	362302.24	1228979.60	Sabon Gari	Night
57	Point	0	Marmara, Sabon Gari	Others	361802.71	1229307.68	Sabon Gari	Night
58	Point	0	Marmara, Sabon Gari	Homicide	361991.09	1228880.11	Sabon Gari	Night
59	Point	0	Marmara, Sabon Gari	Robbery	361730.74	1228878.00	Sabon Gari	Night
60	Point	0	Marmara, Sabon Gari	Intimidation	361559.29	1229191.26	Sabon Gari	Night
61	Point	0	Marmara, Sabon Gari	Intimidation	361650.31	1229096.01	Sabon Gari	Night
62	Point	0	Timber Shed, Sabon Gari	Drug Abuse	360713.15	1228251.46	Sabon Gari	Night
63	Point	0	Timber Shed, Sabon Gari	Others	360705.74	1228175.26	Sabon Gari	Day
64	Point	0	Timber Shed, S/Gari	Others	360650.18	1228090.6	Sabon Gari	Day
65	Point	0	Timber Shed, Sabon Gari	Theft	360760.25	1228163.62	Sabon Gari	Night
66	Point	0	Agoro	Rape	359970.99	1226478.86	Tudun Wada	Night
67	Point	0	Agoro	Drug Abuse	359847.96	1226447.91	Tudun Wada	Night
68	Point	0	Agoro	Homicide	359935.28	1226388.38	Tudun Wada	Night
69	Point	0	Agoro	Others	359949.56	1226430.45	Tudun Wada	Night
70	Point	0	Agoro	Intimidation	359938.45	1226410.60	Tudun Wada	Night
71	Point	0	Kofar Doka	Intimidation	358963.59	1225008.90	Zaria City	Day
72	Point	0	Kofar Doka	Others	359204.10	1224989.06	Tudun	Day

							Wada	
73	Point	0	Baban Dodo	Others	358216.36	1222726.19	Zaria City	Day
74	Point	0	Baban Dodo	Assault	358469.30	1222775.94	Zaria City	Night
75	Point	0	Baban Dodo	Others	358294.15	1223024.65	Zaria City	Day
76	Point	0	Hayin Ojo	Drug Abuse	362252.80	1230118.34	Sabon Gari	Night
77	Point	0	Hayin Ojo	Others	362007.27	1230279.21	Sabon Gari	Night
78	Point	0	Hayin Ojo	Others	361979.75	1230763.93	Sabon Gari	Day
79	Point	0	Hayin Ojo	Intimidation	361859.10	1230435.84	Sabon Gari	Night
80	Point	0	Layin Musa Gwarzo	Drug Abuse	360046.03	1225943.38	Tudun Wada	Night
81	Point	0	Layin Musa Gwarzo	Prostitution	360149.48	1225870.09	Tudun Wada	Night
82	Point	0	Kwantresha	Assault	361747.31	1231416.86	Sabon Gari	Day
83	Point	0	Kwantresha	Others	361354.40	1231218.42	Sabon Gari	Day
84	Point	0	Dogon Bauchi	Others	361580.14	1228666.97	Sabon Gari	Night
85	Point	0	Dogon Bauchi	Rape	361905.62	1228383.97	Sabon Gari	Night
86	Point	0	PZ	Others	360215.65	1227469.74	Sabon Gari	Night
87	Point	0	PZ	Theft	360299.31	1227704.74	Sabon Gari	Night
88	Point	0	PZ	Others	360278.28	1227720.22	Sabon Gari	Day
89	Point	0	Makwalla, Zaria City	Drug Abuse	357892.19	1221894.22	Zaria City	Night
90	Point	0	Makwalla, Zaria City	Intimidation	357914.81	1221690.35	Zaria City	Night
91	Point	0	Makwalla, Zaria City	Others	358043.00	1221789.70	Zaria City	Night
92	Point	0	Dogarawa	Assault	360695.60	1230981.94	Sabon Gari	Day
93	Point	0	Dogarawa	Others	360080.88	1231066.61	Sabon Gari	Day
94	Point	0	Gaskiya Layout	Prostitution	358121.06	1226258.72	Tudun Wada	Night
95	Point	0	Gaskiya Layout	Theft	358000.68	1226425.67	Tudun Wada	Day
96	Point	0	Tukur Tukur	Theft	357022.65	1226414.45	Tudun Wada	Day
97	Point	0	Tukur Tukur	Prostitution	357060.88	1225413.80	Tudun Wada	Night
98	Point	0	Bakin Dogo	Drug Abuse	361997.14	1231385.08	Sabon Gari	Night
99	Point	0	Bakin Dogo	Assault	361869.62	1231008.84	Sabon Gari	Day
100	Point	0	Layin Dandutse	Others	360210.36	1225442.10	Tudun Wada	Night
101	Point	0	Layin Dandutse	Theft	360023.83	1225263.54	Tudun Wada	Night
102	Point	0	Nagoyi	Burglary	365002.03	1225583.73	Tudun Wada	Day
103	Point	0	Nagoyi	Drug Abuse	364329.98	1225668.40	Tudun Wada	Night
104	Point	0	Gyellesu, Bini Doti St.	Prostitution	361355.98	1226260.63	Tudun Wada	Night
105	Point	0	Gyellesu,	Intimidation	361165.88	1226179.93	Tudun	Night

			Bini Doti St.				Wada	
106	Point	0	Dakaci	Intimidation	362868.15	1224927.87	Tudun Wada	Night
107	Point	0	Dakaci	Theft	363266.61	1225059.64	Tudun Wada	Day
108	Point	0	Rimin Kambari	Others	358448.01	1221607.54	Zaria City	Night
109	Point	0	Rimin Kambari	Assault	358661.00	1221856.25	Zaria City	Day
110	Point	0	Kwarbai	Drug Abuse	358722.12	1223864.45	Zaria City	Night
111	Point	0	Kwarbai	Intimidation	358682.65	1223324.92	Zaria City	Night
112	Point	0	Limancin Kona	Others	357700.57	1222586.65	Zaria City	Day
113	Point	0	Limancin Kona	Others	357298.40	1221967.53	Zaria City	Day
114	Point	0	Unguwan Nupawa	Theft	357964.40	1222139.32	Zaria City	Night
115	Point	0	Unguwan Nupawa	Drug Abuse	358243.75	1222181.75	Zaria City	Night
116	Point	0	Hussainiya	Intimidation	360236.56	1228992.71	GRA	Day
117	Point	0	Hussainiya	Intimidation	360264.90	1228510.91	GRA	Night
118	Point	0	Roundabout area	Intimidation	360131.89	1227194.65	Sabon Gari	Day

Source: Oral interview/NPF, 2015.