

SPATIAL ANALYSIS OF CRIME HOT SPOTS USING GIS IN UNIVERSITY OFF-CAMPUS ENVIRONMENTS, ONDO STATE, NIGERIA

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ABSTRACT: *The university students in this study experience high crime rate over the years and often subject to feeling of insecurities. Hence, the need for this study to develop a hot spot map for crime locations with a view to forming points of security alert for crime reduction in the study area. Primary and secondary data were used in this study. Primary data were collected directly from students who reside off-campus. Data were collected through the use of questionnaire focusing on type, location and crime occurrence in the study area. The coordinates of the study locations were obtained with handheld Global Positioning System (GPS). However, secondary data included base map of the study area. Purposive sampling technique was adopted to select 5 off-campus locations. Proportionate sampling was used to select 190 hostels, one-third of existing 570 hostels. Systematic random sampling was further adopted in selecting 190 students in the study location. Such that in each hostel, a student was administered with a copy of questionnaire and a total of 190 copies of questionnaire were administered in the study. Methods of simple percentages, 3-points likert scale and geo-spatial techniques were used for data analysis. Results reveal burglary, theft, rape and assault as major crimes. The causes of crimes are peer group influence, drug abuse, cultism, poverty, and overpopulation. This study has also identified Adefarati (+25) and Medoline (+45) as hot spot locations with high crime rate with the use of geospatial technique. It therefore recommends regular updated records of crime detection points alongside its geographic coordinates to track crimes at spot level rather than neighborhood level.*

Keywords: *spatial, crime-hot spot, GIS, crime incidence, mapping*

INTRODUCTION

Crime is one of the continuous problems that bedevils the existence of mankind. It is obvious that Nigeria society has been enmeshed in all manner of crimes as it occurs in every clime. Nigerian tertiary institutions are often known for its high crime rates. It could be difficult to believe that university institutions are not entirely safe environments despite its key responsibility to impart moral trainings in everyone. In the study of Benjamin & Fashola, (2012) for instance, traumatic event(s) and place of residence are significant independent determinants of fear of crime among University students. It is, however, an unavoidable fact that students often become victims of crime within the campus and off-campus environments. The university students in this study experience high crime rate over the years, which oftentimes subject them to the feeling of insecurities.

A number of studies have examined crime and violence on University campuses (Malczewski & Poetz, 2005; Brower & Carroll, 2007; Radda & Ndubueze, 2013; Woodward, Pelletier, Giffin & Harrington, 2016). Many of the researchers have the notion that most substantial crime rate are traceable to students on campus, interestingly, most crimes perpetrated on campus could be found as well in the off-campus residence. In a different view, Baum & Klaus, (2005) noted that 93% of campus crime takes place off campus. There are many other intricacies, which describe the lifestyle of students living off-campus as it relates to subjecting students to negative influences. It is assumed greatly that students living on campus enjoy safety and security. However, inadequate accommodations for students on campus still remains a great bottle neck in most of Nigerian universities. It is highly disturbing to note that both federal and state owned universities in Nigeria are deficient of sufficient accommodation for their students. This is as a result of poor funding of university education. Consequently, great number of students who do not get accommodation on campus reside off-campus. The off-campus residences are the next available places for students to reside. Such students are on their own with little or no university inspection and with a high level of insecurity, though the off-campus residences are usually close to the university communities.

In the present times, cases of rape, theft, assault, and burglary are beginning to increase in university institutions noticeably. Gover et al (2008), identifies two major categories of crimes that occur on tertiary institution campuses. The first type referred to is the “low-probability, multiple-death incident”, where consequences are wide-

spread and long-lasting. The second category includes crimes such as robbery, sexual assault, assault, theft, burglary, or fraud, and has a much higher rate of occurrence in contrast to the first. Both these types of crime have entered into university institutions leaving many students victims of crime. It was equally noted by Ahmadi, (2003) that most of the crimes with which the criminal justice system is concerned involve breaches of State/Territory legislation that cover most offences relating to persons (for example, murder and sexual assault), and property (for example, theft and property damage).. Interestingly, great number of these crimes are traceable to off-campus environment due to less security apparatus.

It is pertinent to note that crime have become a routine in such a way that students can no longer concentrate on lectures in class but full of panics and insecurities on life and properties. So far, security strategies adopted to rescue this situation include university security intervention, community vigilante and police patrol. However, these efforts to curb the increasing rate of crime have not yielded much results. This is because the traditional and age-old system of intelligence and criminal record maintenance has failed to live up to the requirements of the existing crime scenario. The solution to this ever-increasing problem lies in the effective use of Information Technology (Francis *et al*, 2006). Clarifying where different types of crime and crime incidences occur is one of the many important functions of crime analyses. As noted by Levine (1999), certain areas are more prone to higher concentrations of crime, widely labeled as 'hot spots'. Such areas are often targets of increase in manpower from law enforcement agencies in an effort to reduce crime. The identification of hot spots is helpful because most police department is understaffed. As such the ability to prioritize intervention through a geographic lens is appealing. This is because large proportion of the men of the Nigerian Police Force can hardly ascertain the areas under the jurisdiction of their stations or define the shortest route from their station to specific crime areas (Soneye, 2002).

Crime mapping and analysis will help in decision making because the information gotten will reveal areas that are in need of more police formation in checking criminal activities. Currently, GIS is not commonly used to fight crime in Nigeria. This is due to the lack of awareness of the benefits offered by GIS in crime control and management in the country. Crime analysis can support decision making, problem solving, and strategy planning at every level of policing.

Currently, there is increasing cases of criminal activities in Akungba, a neighborhood town to one of the State owned university in Nigeria, which calls for urgent concern. This is because the campus location has experienced exponential growth both in population and socioeconomic activities over the years. On this premise, the present study focuses on application of GIS to map major hot spot of crime with a view to detecting point-based location of crime activities within the university off-campus environment. Hence, this study intends to achieve the following objectives; types and locations of crime in the study area, periods of crime occurrence, perceived causes and effects of crimes, geo-spatial pattern of crime incidence and crime hot spot in Akungba.

LITERATURE REVIEW

Concept of Crime

The concept of crime involves the idea of a public as opposed to a private wrong with the consequent intervention between the criminal and injured party by an agency representing the community as a whole. Crime is thus the international commission of an act deemed socially harmful or dangerous. Marshall and Clark (1952) also defined crime as any act or omission prohibited by public law for the protection of the public and punishable by state in a judicial proceeding in its own name. Similarly, Tappan (1960) defined crime as an instrumental act or omission in violation of criminal law, committed without justification and sanctioned by the state as felony or misdemeanor. According to Ahmadi, (2003) the word "crime" is of origin that is; Crimean 'which means charge 'or offence 'Crime is a multifaceted concept that can be defined in legal and non-legal sense. From a legal point of view, it refers to breaches of the criminal laws that govern particular geographic areas (jurisdictions) and are aimed at protecting the lives, property and rights of citizens within those jurisdictions. Most of the crimes with which the criminal justice system is concerned involve breaches of State/Territory legislation that cover most offences relating to persons (for example, murder and sexual assault), property (for example, theft and property damage) and regulation (for example, traffic violations). Commonwealth legislation relates primarily to matters such as trade and commerce, importation/exportation, taxation, defense and external affairs.

Non-legal point of view would define crime as acts that violate socially accepted rules of human ethical or moral behavior. As the moral principles that underpin the notion of crime are subject to gradual change over time, the types of behavior defined by the legal system as criminal may also change. Examples of behaviors that have been decriminalized in some jurisdictions include prostitution, abortion, attempted suicide and homosexual intercourse. Other behaviors, such as tax evasion or credit card fraud, have been criminalized over time (Ahmadi, 2003).

This present study is focused on criminal acts relating to persons and property. These are the types of crimes commonly found in campus related environment.

Crime Mapping and Crime Analysis

Boba (2005) defines Crime mapping as the process of using a geographic information system to conduct spatial analysis of crime and disorder problems as well as other police-related issues. It was also affirmed that mapping has fostered a broader approach to crime problems and gained significant institutional support because of its usefulness as a crime prevention tool. Crime mapping is an important feature for the location of crime and that it does not occur accidentally but instead criminal offences may occur in a conspicuous structures that are harmed by the land scape in which they occur and psychological factors that govern the motion of the offender.

In this study, mapping has provided the capability of displaying any subset of events on a map. It has also been displayed events of a certain type that meet spatial related criteria. For instance, by enabling the visualization of subsets of information, mapping provides an invaluable tool for revealing clusters and patterns of crime in the study area. Another important function that mapping enables in this study is the visualization of the concentration of crime types in a specific location using dots for representation. This approach was supported by Eck et. al., (2005), that method for identifying report events at a single address supports problem-oriented policing efforts by making locations with several calls easily identifiable.

According to McCord (2009), crime Analysis is a systematic process of collecting, categorizing, analyzing and disseminating timely, accurate and useful information that describes crime patterns, crime trends and even potential suspects. Law enforcement needs information management, especially location information. Traditional law enforcement for different types of police applications really deals with data collection. However, data collection without data analysis is useless. GIS application in crime analysis allows integration and spatial analysis of data to identify, apprehend, and prosecute suspects. The efforts in this present study is to establish a proactive measure towards crime reduction through integration of recorded crime cases data and spatial reference data using GIS application in a university environment.

Crime Hot spots

Areas of concentrated crime are often referred to as hot spots. Researchers and police use the term in many different ways. Some refer to hot spot addresses (Eck and Weisburd, 1995; Sherman, Gartin, and Buerger, 1989), others refer to hot spot blocks (Taylor, Gottfredson, and Brower, 1984; Weisburd and Green, 1994), while some examine clusters of blocks (Block and Block, 1995). Crime analysts look for concentrations of individual events that might indicate a series of related crimes. They also look at small areas that have a great deal of crime or disorder, even though there may be no common offender. Analysts also observe neighborhoods and neighborhood clusters with high crime and disorder levels and try to link these to underlying social conditions. One of the programs that work against crime is hot spots policing (Sherman and Weisburd, 1988; Sherman & Weisburd, 1995). A study conducted by Anderson, Santana and Lucilene, de SA in Joao Pessoa in Brazil titled “Spatial Analysis of Crime Distribution”. They use the hot spot analysis using the Kernel density method and their findings revealed that the highest crime rate were committed at the center of the town where shops, banks and places of hanging out are located and also in residential areas where the residents have high purchasing power.

The term hot spot has become part of the crime analysis lexicon and has received a lot of attention. A hot spot is a condition indicating some form of clustering in a spatial distribution. However, not all clusters are hot spots because the environments that help generate crime (the places where people are) also tend to be clusters. So, any definition of hot spots has to be qualified. Spelman (1995) defined hot spots as small places in which the occurrence of crime is so frequent that it is highly predictable, at least over a one-year period. For instance, Malczewski and Poetz (2005) found hot spots of burglary in the areas adjacent to the University of Western Ontario; these areas were characterized by large proportions of rental accommodation and young transient populations, as is the case of most University students.

MATERIALS AND METHODS

Study Area

Akungba-Akoko is found in Akoko South-West Local Government Area of Ondo State, Nigeria (Figure 1). It is one of the education-institutional towns at a distance of 56km away from Akure the state capital of Ondo State. This study location is situated between latitudes 7°28’ and 7°0’ N of the equator and longitudes 5°44’ and 5°0’ E of

Greenwich meridian. It is bounded by Ikare-Akoko to the North, Etioro-Akoko to the South, while to the East and West by Supare-Akoko and Iwaro- Akoko respectively.

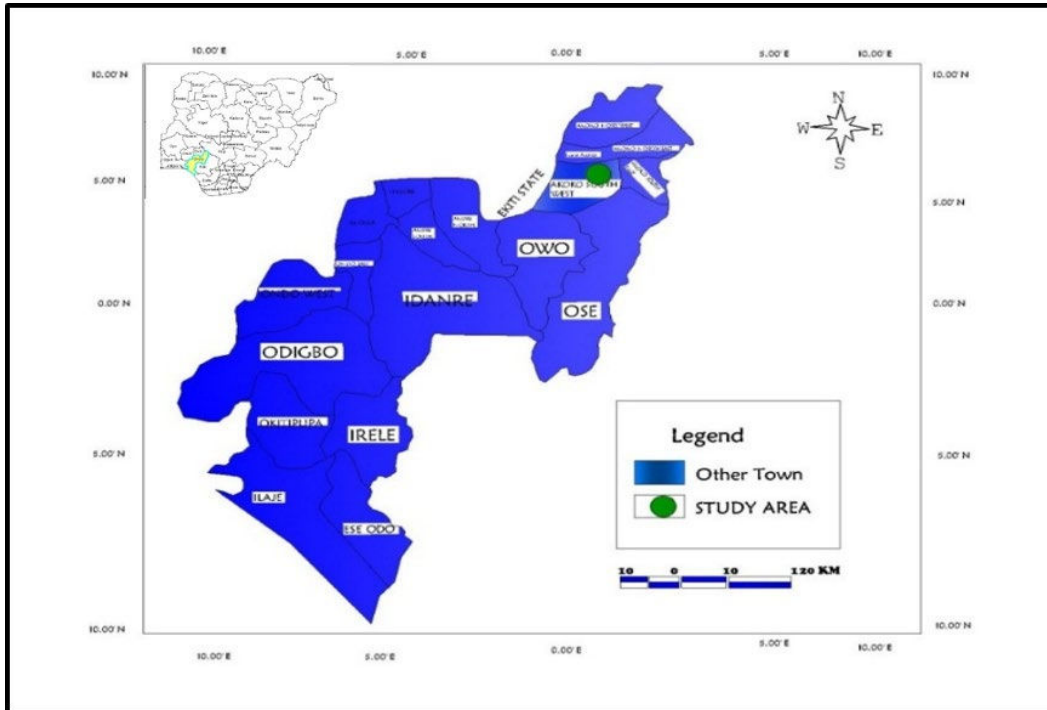


Figure 1: Map of study area (inset: Nigeria showing Ondo State). Source: Ondo State Ministry of Lands and Housing, Akure (2018).

Adekunle Ajasin University (AAUA) is a state government owned and operated Nigerian university. The university is a fast growing institution with the population of 20,000 students.

Methods

Primary and secondary data were used in this study. Primary data were collected through the use of questionnaire, which was divided into 5 sections. The sections include (a) socio economic characteristics of the respondents, (b) types and frequency of crimes, (c) causes of crimes, (d) crime occurrence, and (e) effects of crime activities in the study area. Also, the coordinates of the study locations were obtained with the use of handheld Global Positioning System (GPS). However, secondary data that included base map of the study area from the Ministry of Lands and Housing, Akure, Ondo State, Nigeria; relevant textbooks, journals, seminar papers, internet materials, thesis and dissertations were used in this study.

The study population includes all the students of the University; while the sample frame for the study covered students who live in off-campus hostels. During the reconnaissance survey, the researcher identified 570 students' hostels in the study area. To collect data, this study employed multi-stage sampling design. Purposive sampling technique was first adopted to determine coverage location for the hostels, and these include Permanent Site, Medolines, Adefarati, Glomast, and Ibaka. The locations under consideration were determined based on students' hostel availability, and proximity to the university community. In order to have equal chance for data collection in the study area, systematic random sampling was further adopted to select 190 hostels. This was done by identifying first hostel and subsequently selecting other hostels at intervals of three, representing one-third of the identified 570 hostels within the study area. In such that a student was administered with a copy of questionnaire in each of the sampled hostels. A total of 190 copies of questionnaire were administered in the study.

Data obtained were analyzed using descriptive method of simple percentages, 3-points likert scale and geo-spatial techniques. In the 3-points Likert scale, the Mean Weight Value (MWV) for each response and the General Mean Weight Value (GMWV) to all responses were calculated. MWVs of all the variables were collated and subjected to a decision rule, which stipulated that the response should be rejected if $MWV < GMWV$. The topped ranked factors were noted and accepted. For example, questions on perception as regards causes of crimes were asked from students in such that responses were given in order of agreed, strongly agreed and disagreed.

Also, attempt was made have spatial reference point of crime location in the study area. To do this, the map of the study area was extracted and digitalized from the 1:50,000 topographical map of Ondo State. This was hand-traced with a computer mouse to collect the coordinate of the base map in a GIS environment. The coordinates of crime locations were collected with the use of Global Positioning System and overlain on the base map. The attributes of the crime points were linked to the spatial data with ArcGIS software.

RESULTS AND DISCUSSION

Crime Types and Geo-spatial Pattern of Crime Incidence in Akungba-Akoko

This study has identified four types of criminal activities in the study area (Table 1). These include burglary, assault, theft and rape. It was observed in Table 1 that 19%, 41%, 20%, and 20% were recorded for burglary, assault, theft and rape respectively. This result indicates theft as the prominent crime among the selected study locations. This is because theft has highest percentage than others. The crime incidence map in Figure 2 presents the spatial spread of crime occurrence over the study location. It should be noted that spread of the four crime parameters was ubiquitous over the selected study location. However, cursory observation shows that the concentration of types of crime, as denoted through the point map, varies from one place to other. In general, the present study is in agreement with the findings of Bala, *et al* (2015); Balogun, Okeke, and Chukwukere (2014), where similar types of crime were identified in the school environment in Nigeria. Similarly, Fisher *et. al.*, (1998), found that among violent crimes, assaults (particularly sexual assault) are the most common type of victimization on campus settings. Among property crimes, theft and stealing are the most common type of victimization.

Table 1: Distribution of crime incidences in Akungba-Akoko.

Location	Adefarati		Medoline		Permanent Site		Ibaka		GloMast	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Burglary	10	5.3	15	7.9	2	1.1	3	1.6	1	0.5
Theft	22	11.6	38	20	7	3.7	10	5.3	6	3.2
Assault	21	11.1	12	6.3	0	0	0	0	5	2.6
Rape	10	5.3	18	9.5	6	3.2	4	2.1	0	0
Total	63	33.2	83	43.7	15	7.9	17	8.9	12	6.3

Source: Author's survey, 2019.

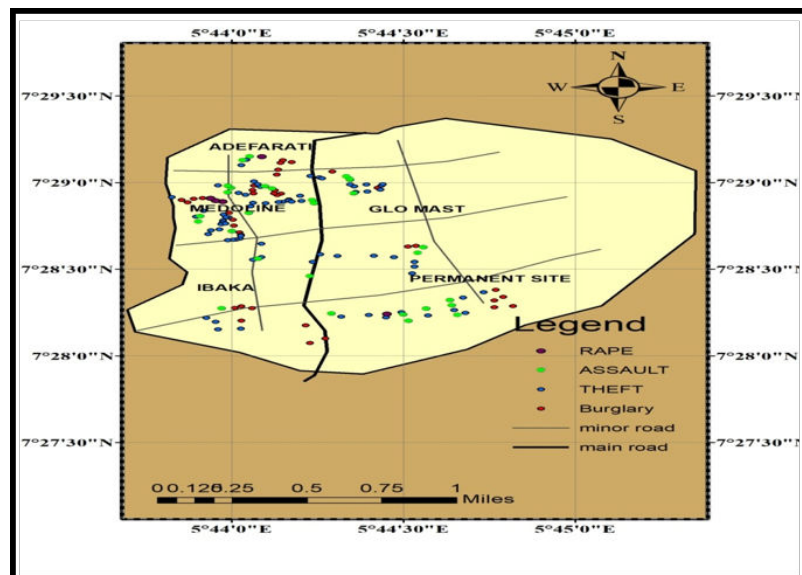


Figure 2: Location of crime incidence.

Identifying the geographical patterns in this study is an effort to understanding how the geographic phenomena under consideration behave over space. The essence of application of geographic analysis to crime was occasioned by integrating all pattern of spatial features and their associated values through mapping technique. Global Positioning System was employed in capturing the spatial reference points of each crime incidence, while the concept of point and polygon overlay analysis was used to map the crime incidence for the individual crime type and the display of crime hot spot in general.

Burglary. This study indicates burglary as one of the crimes in the study area and is presented in Table 1 and Figure 3. The result shows that Medoline has the highest percentage of burglary activities with the rate of 36%, followed by Adefarati with 20%, Permanent site with 30.6%, Ibaka with 9.4% and GloMast with 4%. Burglary activities occur mostly when students are on vacation. This action involves breaking of doors, windows and at times, making a penetrable hole in a building in order to commit a crime.

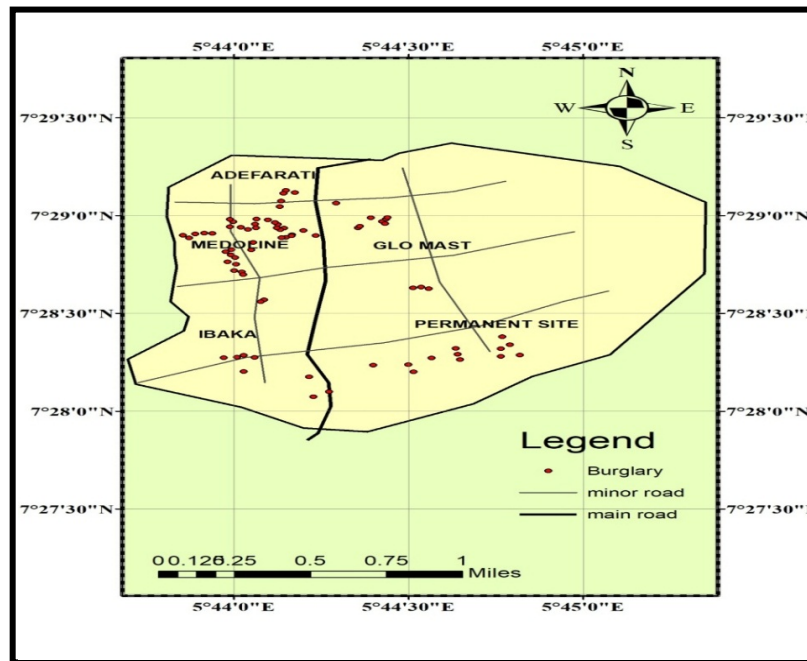


Figure 3: Spatial distribution of burglary incidence.

The geospatial process of point and polygon overlay analysis was presented in Figure 3. The geospatial process revealed the prominence of burglary activities in 2 major locations, Medoline and Permanent site. The spread of burglary activities is slightly low in Adefarati, but low in Ibaka, and GloMast locations. It must be noted that an inadequate security measure aids increased burglary activities in the study location.

Theft. Stealing is another crime in the study area. The point map shows the spread of theft where high concentration was recorded for Medoline (Figure 4). The percentage of theft cases was indicated in Table 1. It was established that 36.7% of theft was in Medoline, followed by Adefarati with 30%, Permanent site with 16.7%, Ibaka with 8.9% and Glo Mast with 7.7%. It must be noted that most theft cases recorded occurred at night where most valuable items like, mobile phone, money, laptop are being carted away.

Rape. The percentages of rape were recorded in Table 1, where Medoline has 36.7%, followed by Adefarati with 33.3%, Permanent site with 30%, Ibaka with 0% and GloMast with 0%. Indeed, Medoline has the frequent occurrence of rape with highest concentration of cases (Figure 5).

Assault. The distribution of assault over the study location was presented in Table 1. It was revealed that Medoline has the highest percentage of theft with 33.3%, followed by Adefarati with 26.7%, Permanent Site with 23.3%, Ibaka with 6.7% and GloMast with 10% (Figure 6).

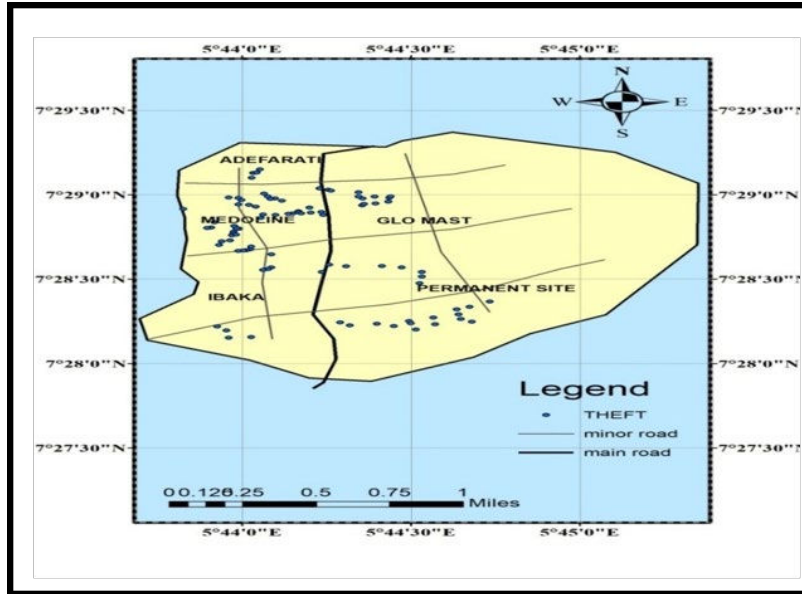


Figure 4: Spatial distribution of theft incidence.

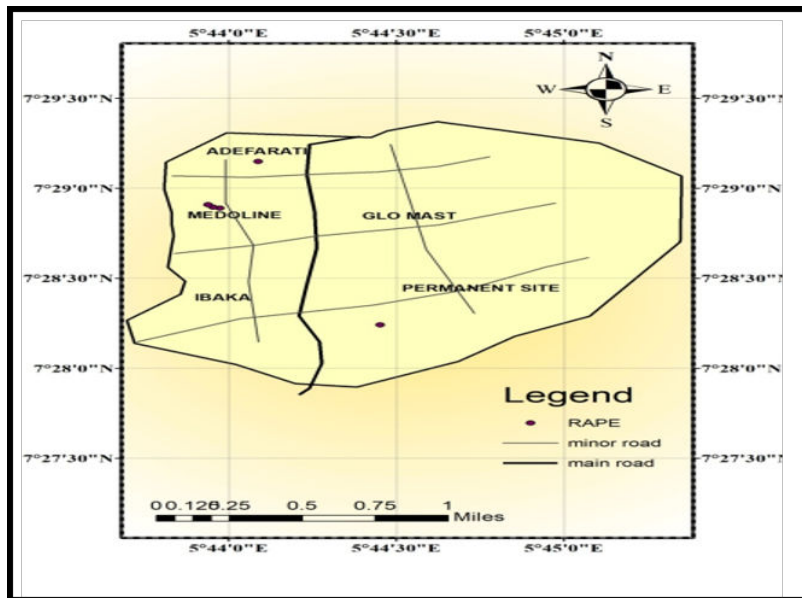


Figure 5: Spatial distribution of rape incidence.

Periods of Crime Occurrence

The university runs two semesters in every session. Each of the semesters is naturally divided into three phases, that is, beginning, middle, and ending. It should be noted that criminal activities occur differently in each of the three phases of the semesters. For instance, the beginning of semester is usually referred as a “period of surplus”, when students have enough cash, food stuff and every other necessity to keep up in school. The second phase, which is referred to as middle of semester can be termed as “coping period” for students. However, the ending of the semesters is always referred to as “dried period”, when many of the university students are broke in terms of financial capacity and other needed materials. This is when hunger sets in and desire to meet all needs increases. At this point, inability to get on due to lack of basic needs prompts some students to engage in criminal tendencies.

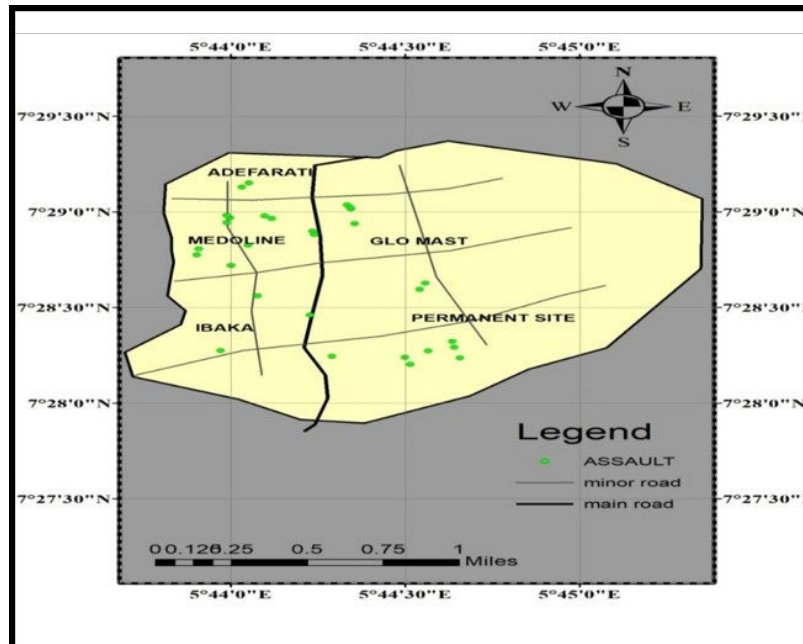


Figure 6: Spatial distribution of assault incidence

In Table 2, responses of students to crime occurrences as relates to beginning, middle and ending of semester were presented. This study established, through the perception of respondents, that 15.8% response indicates crime occurrence at the beginning of semester, 36.8% indicates that criminal activities occur at the middle of semester, while 47.4% implies crime occurrence at the ending of semester. From the forgoing, it could be established that criminal activities in the campus environment are mostly occur during the ending of every academic semester.

Table 2: Period of crime occurrence.

Respondent	Frequency	Percentage
Beginning of semester	30	15.8
Middle of semester	70	36.8
End of semester	90	47.4
Total	190	100

Source: Author’s survey, 2019.

Apart from semester-based occurrence of crime, daily records of crime were also presented in Figure 7. This indicates occurrence of criminal activities at morning, afternoon and evening periods. The result of survey conducted among the off-campus students shows that 10.5% response indicates criminal activities in the morning, while 5.3% representing crime occurrence in the afternoon. However, 84.2% established that crimes occur at night. It should be established that most of the criminal occurrences in the university off-campus are notably at highest during the night hours. This result supports Badiora & Ntamark (2016), who stated that night (darkness) reduced capable guardians as a result of a decrease in the number of people on the streets. In another studies, Molumby, (1976) observed that 70% of crime at campus residences occur between midnight and 7:00am.

Perceived Causes and effects of crimes in Akungba

There are several causes of crime in any human society. This study has however identified seven major causes of crime in the study area. They include, poverty, overpopulation, peer group influence, depression, drug abuse, cultism, and mental disorder. In order to examine level of the identified causes of crime, 3 points likert scale was employed, based on responses of from the respondents.

The 3 points likert scale used indicates decision on acceptance and rejection of the causes of crime activities (Table 3). The result of the analysis revealed that depression and mental disorder were not responsible for crime in the study area. This is because the Mean Weight Values (1.77 and 1.44) for depression and mental disorder were

below the Grand Mean Weight Value of 1.88. However, poverty, overpopulation, peer group influence, drug abuse, and cultism were accepted as causes of crime because the Mean Weight Values were above the Grand Mean Weight Value of the likert scale.

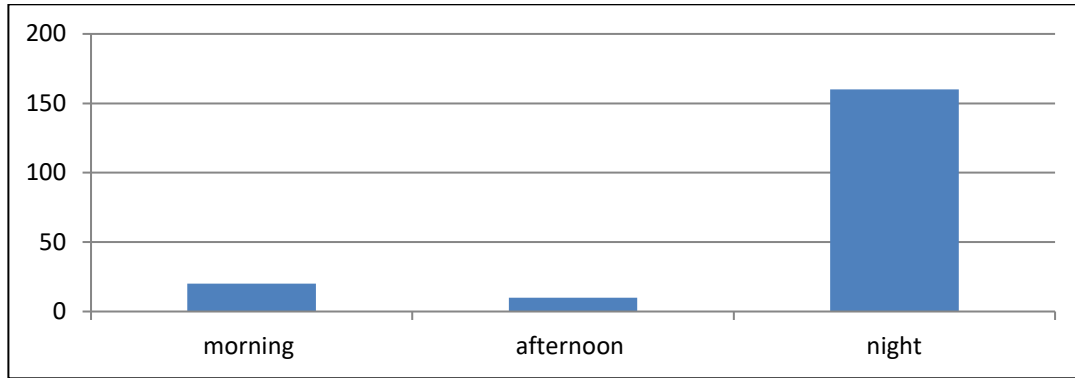


Figure 7: Period of crime occurrence. Source: Author’s survey, 2019.

Table 3: Causes of crime in Akungba-Akoko

Items	3 Points Likert Rating Scale			Total	3 Points Likert Rating Scale			Total Weight Value	Mean Weight Value	Decision
	Fairly Agreed	Agreed	Strongly Agreed		1	2	3			
Poverty	60	64	66	190	60	128	198	386	2.03	Accepted
Overpopulation	57	85	48	190	57	170	144	371	1.95	Accepted
Peer group influence	64	63	63	190	64	126	189	379	1.99	Accepted
Depression	74	86	30	190	74	172	90	336	1.77	Rejected
Drug abuse	57	64	69	190	57	128	207	392	2.06	Accepted
Cultism	62	87	41	190	63	174	123	360	1.89	Accepted
Mental disorder	119	59	12	190	119	118	36	273	1.44	Rejected
GMWV = 1.88										

Source: Author’s survey, 2019.

This study further examined the effects of criminal activities in the study area. The parameters involved include insecurity, displacement of Student, loss of property, and evacuation of student to a more secured location. The 3 points likert scale established the rejection of evacuation of students (Table 4). That is, there has not been any time students were once moved entirely from an affected hostel to another due to crime activities in the study area. However, the study further revealed that level of insecurity among the students is high with Mean Weight Value of 2.97 above the Grand Mean Weight Value of 2.91. Likewise, the study identified displacement of student, and loss of properties as parts of the effect of criminal activities. Many times, students do abandon their hostel to seek refuge with friends before returning home. This is commonly practiced by the affected students in order to seek immediate relief from panic inflicted by the criminal acts. It was also revealed that affected students live in fear of shocks for days.

Table 4: Effect of crime in the study area.

Items	3 Points Likert Rating Scale			Total	3 Points Likert Rating Scale			Total Weight Value	Mean Weight Value	Decision
	Fairly Agreed	Agreed	Strongly Agreed		1	2	3			
Insecurity	0	5	185	190	0	10	555	565	2.97	Accepted
Displacement of Students	0	14	176	190	0	28	528	556	2.93	Accepted
Loss of Property	0	17	173	190	0	34	519	553	2.91	Accepted
Evacuation of students	2	20	167	190	2	40	501	543	2.86	Rejected
GMWV = 2.91										

Source: Author’s survey, 2019.

Crime Hot Spot in Akungba-Akoko

As noted by Brower & Carroll (2007) who established that crimes are not evenly distributed throughout the University environment. In other words, crime rates were unevenly distributed throughout the study area in a non-random manner. As a result, hot spot analysis was carried out in this study to reflect area of overall increased rate of crime activities in the study area. In order to do this, hot and cool spots were identified and mapped in the study area. The analysis identified areas with crime incidence through average returns method. That is, locations that have positive average returns are referred to as “hot”; while cool spots were identified as locations with less than the average of crime cases. However, it must be noted that some hot spots may be hotter or cooler than others. The appropriateness of hot spots in this study support the work of Spelman (1995) who defined hot spots as small places in which the occurrence of crime is so frequent that it is highly predictable, at least over a one-year period. There are two locations, Adefarati (+25) and Medoline (+45), with high crime rate based on their calculated differences between average and number of crime cases (Table 5). Thus, the two locations were identified as crime hot spots and indicated with deep red colour in Figure 8. Light red and light blue indicate medium cool spots, while deep blue represents low cool spot. Such locations with medium cool spot and low cool spot include Permanent site (-23), Ibaka (-21), and Glo Mast (-26). It is important to note that Adefarati and Medoline returned positive average as hot spot are locations characterized with regular influx of students due to residential preference because of its nearness to the campus. Further, it must be also noted that many of the hostels in the hot spot areas are in remoteness, which could serve as hideout for the perpetrators. Indeed, geospatial analysis is a useful tool in identifying crime location. To this, Weisburd and McEwen (2004) affirmed that mapping has fostered a broader approach to crime problems and gained significant institutional support because of its usefulness as a crime prevention tool.

Table 5: Determining crime hot spot in Akungba-Akoko

s/n	Location	No. of crime cases	Diff. btw. Avs and no. of crime cases	Remarks
1	Adefarati	63	25	Hot spot
2	Medoline	83	45	Hot spot
3	Permanent site	15	-23	Not hot spot
4	Ibaka	17	-21	Not hot spot
5	Glo mast	12	-26	Not hot spot

Source: Author’s survey, 2019.

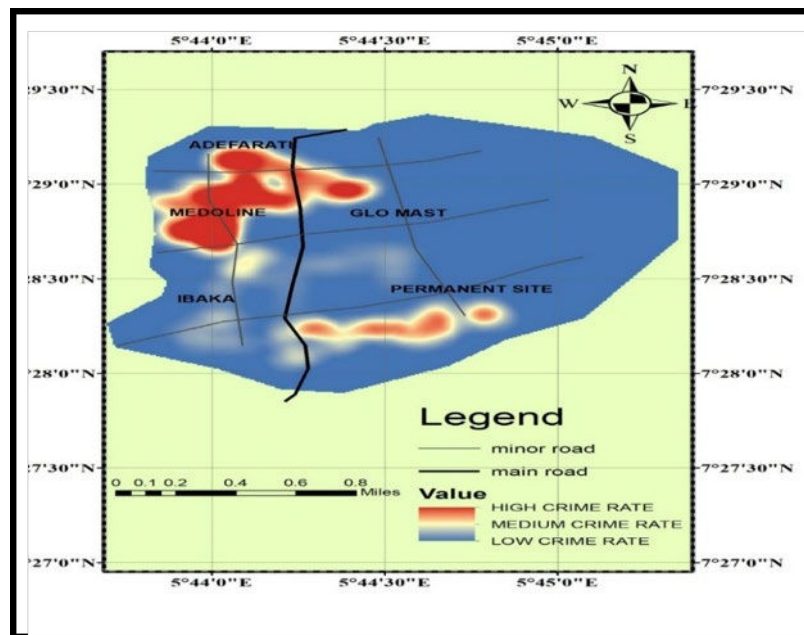


Figure 8: Crime hot spots.

CONCLUSION

This study identified burglary, theft, rape and assault as major crimes in the study area. The causes of crimes were the peer group influence, drug abuse, cultism, poverty, and overpopulation. Students, over the years, have been subjected to forceful displacement from their personal hostel to seek refuge with friends. Apart from this, loss of properties through theft and burglary, and threat to life as a result of rape were equally observed. In order to avert this precarious situation among off-campus students, this study has utilized geospatial technique to identify crime hot spots in the study area. The developed crime hot spot map is capable of forming points of security alert for crime reduction. It therefore recommends updated records of crime detection points alongside its geographic coordinates to track crimes at spot level rather than neighborhood level.

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