



Location of police facilities and the spatial distribution of reported crime in Ilorin, Nigeria

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Abstract: This study examined crime situation in Ilorin metropolis using Geographic Information Systems (GIS). The specific objectives of the study were to: examine the spatial pattern of police facilities and reported criminal activities in the study area as well as determine the relationships between the spatial pattern of police facilities and pattern of reported criminal activities in Ilorin metropolis. Data were sourced from crime records of 10 consecutive years (2006 to 2016) used in the classification of the types of crime with respect to the spots of occurrences. An interview was also conducted with a police officer and 1m resolution QGIS open street images was geo-referenced and features such as roads, rivers and boundaries were extracted, Township-facilities, and police stations x, y coordinates were obtained using handheld GPS. QGIS version 2.18.3(2016) was used for the analyses. Results of the study revealed that there was variation in the distribution of crime between and within the sectors. A nearest neighborhood analysis showed that police stations were randomly distributed in the study area. Buffer zones were generated and the result showed that the central area was best served, the outskirt was moderately served, the eastern part of the metropolis was adequately served while the west and southern part were underserved. The study also identified that pattern of crime was irregular but mostly unique to each area because of the settlement function provided by that area and that police station were located to seamlessly combat crime in the hotspot of the city.

Keywords: Crime hotspot, Crime mapping, GIS, Criminal activities, Police facilities

Introduction

In the light of increasing population and rapid urbanization, crime has become a major social problem in towns and cities across the globe, being a phenomenon, which is universal in its varying forms in all cultures and societies. The alarming increase in the rate of criminal activities in Nigeria is observable in the structure of its news column, as all daily newspapers devote a significant proportion of column to reports of murder, kidnapping, theft and other crimes. Lives and property no longer seem safe anywhere in the country, the whole society appears helpless in the face of urban crime (Agboola 2004; Alemika & Chukuma 2005; Sanni, *et al* 2010). Everybody seems to live one day at a time in fear of crime, which reflects the nature of our society hence the need for security upgrade. As security needs is one of the basics for human survival. In fact, it is second to food and clothing. According to Abraham Maslow's theory of hierarchy of human needs, security is the second need, only preceded by physiological need which include food and shelter.

The conception of crime is based on offences being committed against the citizens of a country or its sets of rule and regulations (Omoyibo, 2012). Crime, according to Dan Bazau (1994) is something which offends the morality of the society, or that violates the divine law.

The consensus approach to defining crime presents it as; an offence that is committed by omission, commission or deliberately. Criminal activities have become more frightening in the World today and it is a major source of social concern and Police provide security in all countries internally.

Studies of crime pattern across the globe have established that there are differences in the rate and pattern of crime in time and space. Analysis of spatial variation in crime at the global level reveals that a high rate of crime is associated with less-developed regions of the world (World Health Organization, 2004). The spatial pattern of crime is also found to vary across the different spatial components of a settlement across the globe (Hung & Nguyen, 2002). Using Chicago as a model, Park and Burgess (Winterdyk, 2000) found that criminal activity was associated with what they referred to as 'zones in transition' located around the city center (Winterdyk, 2000). The nature, pattern and rate of crime are influenced by a few factors.

Police networks are observed in terms of its components of accessibility, connectivity, size, level of service, and available man power. Level of service is a measure by which the quality of service by police is determined, and it is a holistic approach considering several factors regarded as an inverse proportion of crime density rather than overall number of arrest

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(Mannering *et al.*, 2004). Access to adequate level of service from police facilities provides relative advantages consequent upon which industries, trades and general activities enjoy the advantages of police facilities for the provision of security and traffic control as this is a vital and inseparable aspects of global and urban criminal survival management. Developments of various police facilities have become pivotal to physical and criminal reduction. Such police facilities include police stations, police personnel, police training school, police traffic post, police vehicles etc.

Researches in Nigeria within the last decade have revealed that about one third of the country's urban residents are reported as being victims of major and/or minor crime at least once in every five years, regardless of where they reside (Alemika & Chukwuma, 2005; Alemika & Omotoso, 2009; Fajemirokum *et al.*, 2006). Nigeria is one of the countries with heightened national security challenges and is regarded as being the home of a substantial network of organized crime (World Bank, 2010). These reported global and national security situations have resulted in crime capturing the attention of the general public in Nigeria and across the globe (Fajemirokun *et al.*, 2006). The statistics of reported crime nationwide show an increase from 251,055 cases in 1991 to 319,616 in 1993, while the number of serious crimes reported rose from 120,911 in 1995 to 144,505 in 2000 (Agboola, 2004).

Ilorin is a classic example in the history of growth and development of cities in Nigeria. In 1976, the city became the capital of Kwara State. Since then, an improved police networks have been developed to cater for the increased population. This increased population is partly responsible for the Hot spots and Cool spots of crime location (an Area susceptible to crime or criminal activities is known as hot spots while areas with less than the average amount of crime or disorder are known as Cool Spot). Although, in most cases some hot spots may be hotter than others depending on the criminal activities ongoing there. Nevertheless, these factors have increased the demand for police facilities in many residential and commercial space in the metropolis.

Research Problem

Several factors have been reported to be responsible for criminal activities. However, Jayamala, (2008) positioned that crime has social and space dimension. He further opined that crime tends to find explanations in the interaction between environmental (space), economic and social factors. This corroborates the assertion of Ige (2015) that crime does not occur in a vacuum, but within a Geographical space. It is not only economic hardship, deprivation or social stress that causes criminal

activities, rather the influence of space and the opportunity provided within a geographical area. The criminal activities itself is affected by changes in population, planning and development schemes, but according to UN-Habitat (2007), crime is linked to a range of economic, social, cultural and political circumstances that produce opportunities and incentives for criminal behavior and acts of violence. These different factors of crime are interwoven and causal in nature. They could be categorized into two groups; those that increase the motivation to commit crime; and those that enhance the opportunities for criminal activity (William & Allen, 2004). Motivational factors such as low family values, low educational attainment, and growth of the number of unemployed youths, deprivation and consequent poverty, propel individuals to commit crime.

Crime mapping has long been an integral part of the process known today as crime analysis. The use of maps in crime study has been traced back to at least the year 1900 (New York City Police Department). Most developed nations have migrated from the "pin on maps" to the use of computer GIS. Unfortunately, most of the developing nations, including Nigeria, still utilize analog and outdated file systems. In most cases, police operations are carried out based on intuition, tip-off information and the simple "trial-and-error" method. Furthermore, the old pin maps were useful for showing where crimes occurred, but they had serious limitations because as they were updated, the prior crime patterns were lost. The maps being analogs are usually not easy to manipulate. In addition, pin-maps could be quite difficult to read when several types of crimes, usually represented by pins of different colours, are mixed together. Pin maps occupied a lot of space, wasted a lot of time, and were incapable of developing a logical, national database. Many societies all over the world have had to contend with the consequences of criminal activities which include lives and properties, fear of the unknown, political stability, victimization by conventional criminals amongst others (Fayeye, 2010).

According to Amin (2011) the operation of the Harmony Police Squad in Ilorin, Kwara State is just a camouflage because of the inability of the police to tackle thugs and drug dealers. He posited that thugs in Ilorin are friends to the police and occasionally they exchange India hemp and alcohol together. Based on these disadvantages, the need to carry out research on a better way to map crime and manage it becomes paramount. Therefore, this study examined the locational pattern of police facilities in Ilorin by exploring the capability of GIS in crime mapping and attempt to provide answer to the following questions:



what is the pattern of police facilities (police station) in Ilorin? What is the spatial pattern and trend of criminal activities in the Ilorin; what is the relationship between Police Man power and Population Distribution in Ilorin and what factors explain the spatial pattern of criminal activities?

Aim and Objectives

This aim of this study is to assess the location of police facilities and the spatial distribution of reported crime in Ilorin Metropolis. The specific objectives are to (i) identify the spatial pattern and trend of criminal activities in Ilorin; (ii) assess the pattern of police facilities in Ilorin; and (iii) examine the nexus between police manpower, police station and population distribution in Ilorin.

Study Area

Ilorin city is the capital of Kwara state, Nigeria. It is the 7th largest city in Nigeria according to the National Population Commission (2003). Ilorin is located between latitude 8°24'N and 8°36'N and longitude 4°10'E and 4°36'E. Ilorin metropolitan is in the south-western part of Kwara state sharing boundaries with little towns and mostly large expands of undeveloped lands of Ifelodun LGA in the east, Asa LGA in the south and Moro LGA at the north western and is the major town of Kwara state as shown in Figure 1.

The study area has nine operational sectors. Sector 1 is centrally located in the study area and consists of areas around the old Ilorin and the Emir's Palace. This is completely engulfed in Ilorin East Local government. In this sector services like interstate train is served and the post office is in; Sector Two consists mainly of residential neighborhoods with occasional commercial users of banks and service offices, running from Fate-Tanke to Old Jebba road. This sector is almost dived into equal half by the boundary of Ilorin East local government and Ifelodun local government; Sector Three consists of places along Gaa-Akanbi-Amoyo Road through Agba Dam which consists mainly of residential neighborhoods with occasional commercial users of banks and service offices, this area is a new stream and a product of the outgrowth of the metropolitan. Sector Four lies in the northern part of the study area. And is located completely in Ilorin East local government.; Sector Five, which is bounded, by Sectors One, Three, Six and Nine consists of Oko-erin, Odo-Okun is characterized by concentration of commercial properties and represents the main industrial sector of the study area consisting of the many industries like Kam wire, Doyin group of industries, Dangote Sugar Factory etc. Hence, it's a major sector as a lot of low earning

factory workers derive their income from this sector. This sector also consists of residential neighborhoods in form of Government Residential Area (G.R.A) (Irewolede housing estate).

Sector Six occupies the southern part of the study area. Just underneath sector five consists of places like Osin and Baba-Ode which is a new developing sector with new growth of houses in places like Gari-Alimi. This metropolis strategically expresses its outgrowth into Asa Local government. Sector Seven is mostly found in Ilorin West Local Government. It consists of places like Oloje, Okelele which consists mainly of low-cost residential neighborhoods with occasional commercial users of banks and service offices. This area is known for its continuous supply of migrants into the urban area. It serves as the slums for urban areas. Sector Eight consists of places like Okolowo, Ogidi, Pakata. It comprises mainly of low-cost residential neighborhoods with occasional commercial users of banks and service offices, which sever as the slums of the urban center; this area is also as a result of continuous supply of rural-urban migration from neighboring rural villages just like sector seven. Sector Nine consists of places like Adewole, Joro and Airport. Residential neighborhoods with occasional commercial users of banks and service offices are majorly found in this sector. The areas in this sector has a new stream and a product of the outgrowth of the metropolis.

There has been an incremental growth in the population of Ilorin. A town of 277,840 people in 1971 and 404,210 people in 1981 and 532,090 people in 1991 grew to over 756,400 people in 2006 (Population Census). The last known population of Ilorin is 856,900 (year 2015). If population growth rate would be same as in period 2006-2015 (+1.4%/year), Ilorin population as at 2017 was 881,005. With the population growth, physical and political expansion, possibilities for development, crime became a major urban problem in the metropolis.

Materials and Methods

The study employed two sources of data. The primary sources of data which include; factors affecting the spatial distribution of police facilities and crime. Different categories of crimes were considered together, this is in order to cover quite several crimes as individual analysis of those crime could lead to a bogus and confusing study. The primary data for this research were obtained from an in-depth interview (participatory analysis techniques) on a police officer.

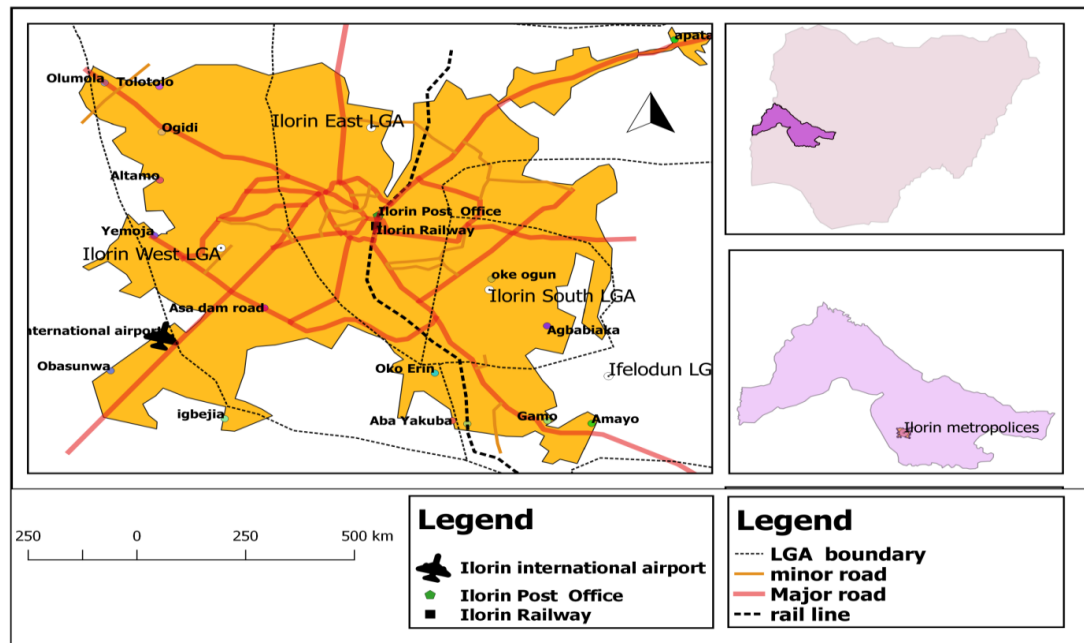


Figure 1. The study area, Metropolitan Ilorin (source: digitals using QGIS Open street archive 2017)

Base Map from QGIS open street map 2017, and the coordinates of the police facilities were collated through field survey and measurements using a GARMIN GPS of 10meters accuracy. The secondary sources of data include list of police facilities, number of police personnel's in each police station, crime data reports from 2006 – 2016 all these were collected from the Department of Research and Planning of Nigeria Police Headquarters in Ilorin dated 5th may 2016. Other information was sourced from journals, magazines, and other researched works. Details of police station were derived through the analysis of the satellite map.

Data Collection and Analysis

Two sets of data were collected namely; data on the locational pattern of police station and data on reported criminal activities. In analyzing the data, many techniques were used, which are descriptive statistics to get the percentage and proportions, Frequency Distribution Tables were used for data presentation and GIS techniques. The number of police personnel's in each police station, factors affecting the spatial distribution of police facilities and crime were summarized using simple descriptive statistics to get the percentage and proportions. Frequency distribution table were used for data presentation. An analogue map of

Ilorin metropolis was obtained, scanned, digitized and then Geo-referenced. The digitized map was then imported to QGIS 2.18.3 software. The co-ordinates of the police stations obtained using GPS which was saved in the Microsoft Excel was also imported to the QGIS 2.18.3 for analysis, integration and presentation of maps. The total number of police stations that traverse the Ilorin metropolis were determined from the corresponding addresses provided by Nigeria police headquarters, Kwara State, the map of Ilorin Metropolis sectional division produced by Ministry of Land and Survey Kwara State 2001 and satellites maps obtained from digitalized Ilorin maps. Geographic information system (GIS) was used to determine the population of police stations captured in the study area.

GIS analysis was employed to examine the spatial pattern of police facilities and reported criminal activities in the study area? This was performed by digitizing the district map using a QGIS map. A point map was also created in order to mark the spatial distribution of police station and reported criminal activities in the study area. Thematic and dot maps were created based on the distribution of police stations and manpower in Ilorin metropolises. In order to determine the relationship between the spatial pattern of police facilities and the spatial pattern of reported criminal



activities in the study area, same method of GIS Analysis (vector and buffer analyses) were used. Thematic maps were created based on the established relationships between the distribution of police station and crime zones, the distribution of police station and multiple buffers of crime hotspot, the distribution of police manpower and crime zones, the relationships between buffer zone analysis of police stations and multiple buffers of crime hotspot. Also, this approach was used to identify the factors that may explain the observed spatial pattern of criminal activities in the study area. As an addendum, in a way to establish the findings of this research, an interview was conducted with a senior officer at the police headquarter.

Results and Discussion

Crime was summarized into four classes for the purpose of accurate analyses. The criterion for categorization of crimes in this study was based on the Nigerian Police Abstract of Statistics (NPACS). Dambazau (1997) posited that offences are categorized into four main categories which are; (i) Offences against person: These includes Murder, Attempted murder, Manslaughter, Suicide, assault, Child stealing, Slave dealing, Rape / Indecent assault, kidnapping, Unnatural offences, Other offences. (ii) Offences against property: Armed robbery, Demand with menace, Thief/Stealing, Burglary, House Breaking, Store breaking, False Pretense/Cheating, Receiving Stolen Property, Unlawful Possession (Drugs/Guns), Arson, Other offences. (iii) Offences against lawful authority: forgery of currency notes, coining offences, gambling, breach of peace, perjury, bribery and corruption, escape from custody, and other offences. (iv) Offences against local act: traffic offences, township offences, liquor offences, dog act, firearms act, narcotics, other offences.

In the year 2006, offences against local act have the highest 212 (36.43%) crimes recorded. This is related to the township offences and other drug activities especially among the youth who venture into trading of Indian hemp. However, crime against property has a total record of 274 (47.0%) of the total crime. This includes the robberies that took place in areas around the metropolis and other minor theft. Offence against persons has a record of 84 (14.4%) of the total recorded crimes. Examples of this crimes are indecent assault, wounding and inflicting brutal injuries which are the most common crimes recorded in the area. Lastly, offences against authority has the least record of 12 (2.1%) of the total recorded crimes. This means that only few recorded crimes were related to traffic offence, corruption, and forgery. Although, one record showed that somebody tried to escape from prison custody.

Crimes reported in the metropolis were low and this could be attributed to the effort of security agencies. It was observed that many people have stopped coming to report criminal offences since they already believe that police services are unpredictable (Table 1).

Spatial Pattern of Police Facilities

The examination of existing patterns of police stations, distributions of Manpower and the analysis of Police Response were used to determine the spatial pattern of police facilities in Ilorin metropolis.

Existing Patterns

In examining pattern of police station, the satellite map of roads in the study area was used. The study revealed that the total number of police facilities (Figure 2) in the area is 12. However, since crime are not reported directly at either the Kwara state police headquarters or the Police Training school nor at the mobile police headquarters, only 9 will be considered (Figure 3). The stations are not evenly distributed in relation to the operational sectors but randomly located. The result of the spatial distribution of police stations in Ilorin metropolis shows an uneven distribution of police stations in the metropolis (Figures 2 and 3). The map which shows this distribution also revealed that the concentration of the police stations is within the central part of the area. This might be because the metropolis has suddenly experiences population explosion. Thus, causing a rapid expansion in the built-up area which has not been merged with the growth and increase in the police facilities. However, the concentration of the police stations within the central area cannot be explained by the Christellar's central place theory, which explains that, the location of services is based on size of community, population, accessibility and proximity, putting into consideration, threshold and range. To ascertain this unevenness spread of the distribution, nearest neighborhood analysis was used.

Neighborhood analysis of the area given is 0.733, as such, ascertains the randomness in the distribution of the police stations in the metropolis. In other words, the police stations are not distributed evenly, this might be because the police have not taken in consideration a detailed structural analysis of the metropolis before deciding on places where stations should be built, or unavailability of building land in the metropolis.

Distribution of Manpower

According to the recommendation of the United Nation on police personnel distribution, one police officer should cater for 450 citizens. Based on this standard,



Table 1: Temporal Distribution of Reported Crime in Ilorin Metropolis (2006-2016)

S/N	Offences	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Offences against person	84	50	31	105	72	56	27	24	48	30	30
		14.4%	19.6%	7.01%	19.7%	18.8%	16.2%	9.2%	9.3%	15.3%	12.1%	12.2%
2	Offences against property	274	93	266	324	211	193	148	116	129	126	110
		47.0%	36.7%	59.6%	60.7%	55.3%	56.0%	51.2%	44.0%	41.5%	50.8%	44.4%
3	Offences against lawful authority	12	11	21	13	9	17	4	0	7	0	0
		2.1%	4.4%	4.7%	2.5%	2.3%	5.0%	1.3%	0.0%	2.3%	0.13%	0.0%
4	Offences against local act	212	99	128	91	90	79	111	123	128	92	107
		36.6%	39.3%	28.7%	17.1%	23.6%	22.9%	38.4%	46.8%	41.0%	37.0%	43.2%
	Total	582	253	447	534	381	344	290	263	312	248	248
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

police manpower distribution in Ilorin metropolis, is far from the standard of the United Nation and at the same time is not evenly distributed in the area. Nearly half of the personnel (44%) are found in central (section 1), while the remaining is shared by the eight other sections. The distribution pattern of police manpower (Figure 4) revealed that the major force of police in manpower is at the core and policing is done outward. Hence it is expected that a great calm or presence of cool spot is located at the core of the city. This might be a great strategy to efficiently manage the little manpower available in the metropolis. Such that it would be easier and faster in time of emergencies to travel to an edge from the center than from one edge to another

Police Response Ability

Buffering is an important analytical tool in GIS it is used to preserve a certain distant around the phenomena. There is no standard distance for citing stations in the country. Also, the ratio of Police officer to population varies across country and states, even in the developed world. For instance, in United States of America, Washington, D.C., maintains by far the largest police presence of any city, with about 57 officers for every 10,000 residents. In Wilmington, Del. It is 43 officers for every 10,000 residents while in San Jose, California there are 9 officers for every 10,000 residents (FBI, 2015). In this study a 1 and 2 (km) buffers were created on the map to identify area that are fully served or not (Figure 6). Essentially, Ahmed et al (2013) employed this method to determine the police coverage in Kano, Nigeria and he prescribed range distance of 1 and 2km far apart. There are nine available police stations that were buffered at distance of 1 and 2km to show the coverage strength of the individual police station and the

area that was underserved by the police station.

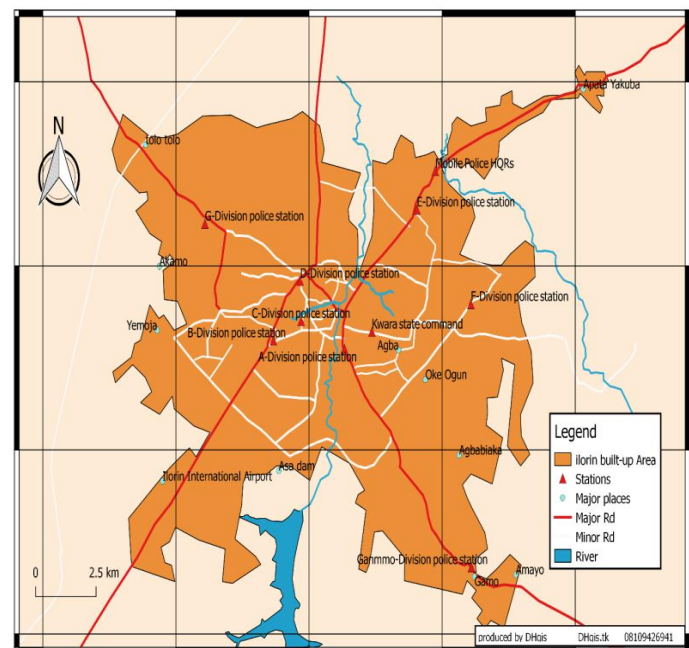


Figure 2. Distribution of police facilities in the study area

The study revealed that the central areas of the city that nearly form a linear part are fully serve, considering both 1 and 2 km buffer, areas in the south of metropolis are under served and in most of the area people must travel more than 1 – 2 km to the nearest police station, it also showed that in areas of Okeogun, Ababiaka, Asadam, Gaa Odota, Ilorin International Airport, Ogidi, ToloTolo, Yemoja, Adeta, etc. are greatly underserved

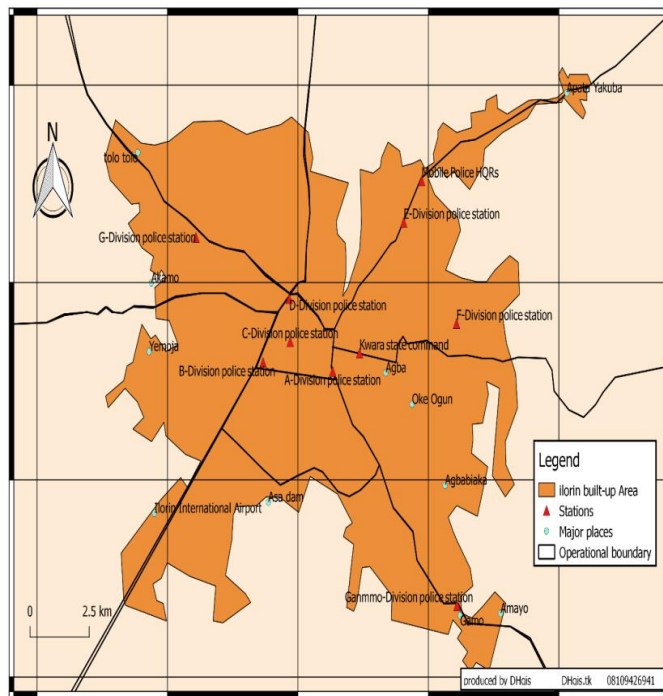


Figure 3. Operational divide of Police facilities in the study area

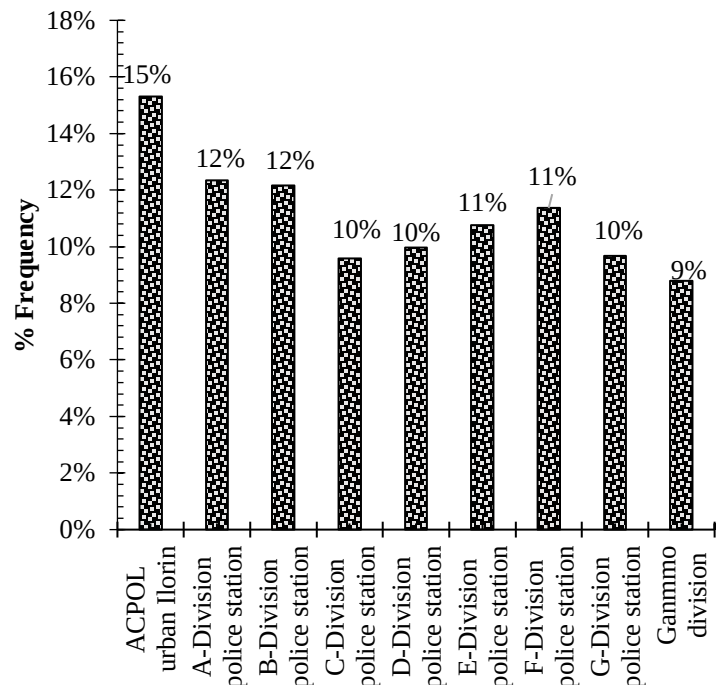


Figure 4. Police personnel power

by the police, this might be a contributing factor to continue violence and street fighting in Adeta.

The underserved areas required people to move more than 2km to get access to police. This has series of negative impact like discouraging crime reporting, increasing criminal get away time especially during robbery and sexual harassment and encouraging jungle justice. This study revealed the need to build more police stations in the metropolis to serve the unserved areas. The reason for lack of police presence (unserved areas) might be attributed to financial constraints, land availability problems etc.

Spatial Pattern of Reported Criminal Activities

In order to examine the spatial pattern of reported crime in the study area the following will be required: analyses of spatial distribution of reported criminal activities and analyses of crime zones

Spatial Distribution of Reported Criminal Activities

For implementing law and order for the whole city nine police stations i.e. Acpol urban Ilorin, A, B, C, D, E, F, G and Ganmo divisions are responsible. However, four different types of crimes (crime against person,

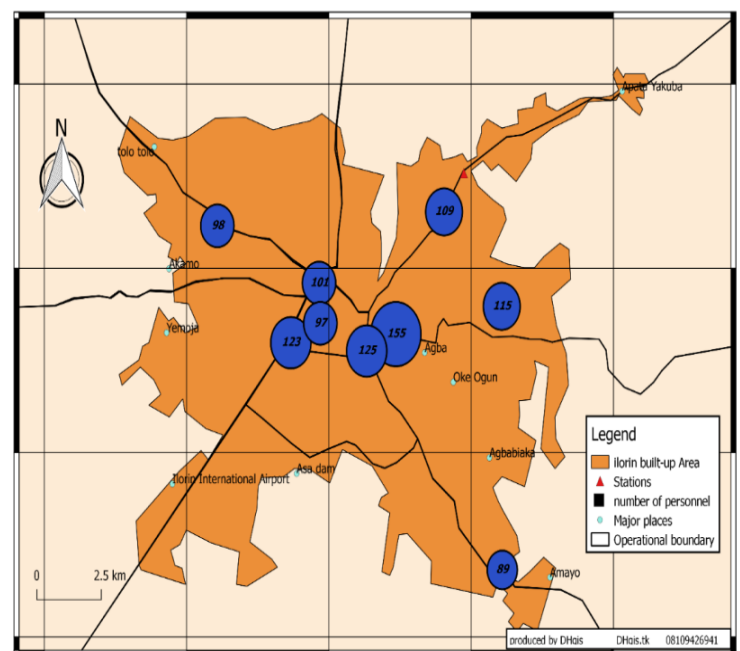


Figure 5. Distribution of police personnel with operational divide

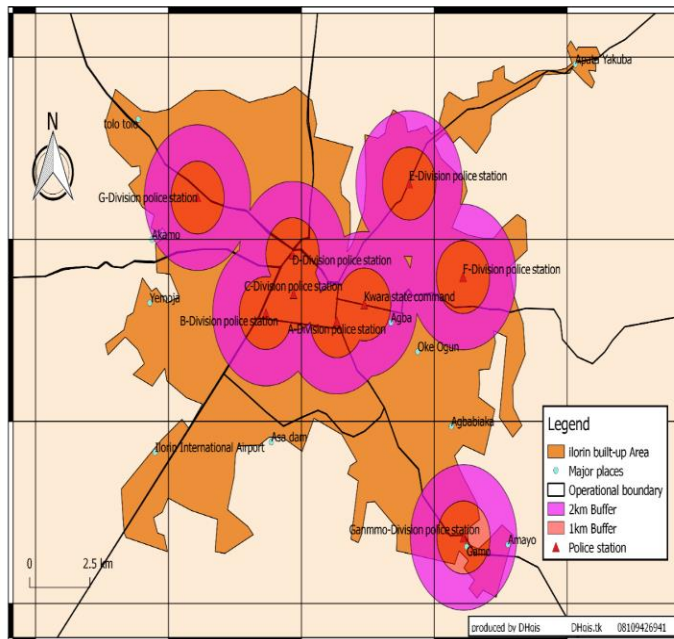


Figure 6: Buffer Zone Analysis of Police Stations in Ilorin Metropolis

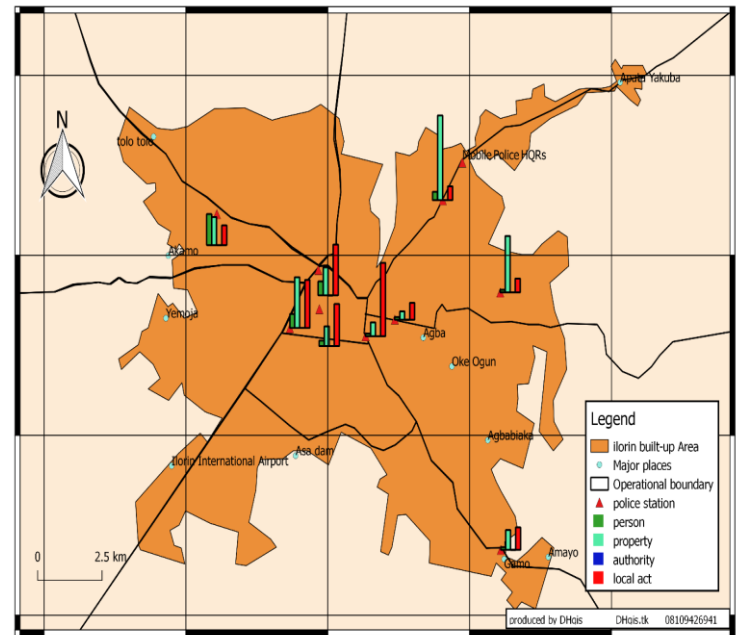


Figure 7: Spatial pattern of 2016 reported crime in the Study Area

crime against property, crime against authority and crime against local acts). The data depicted that Acpol registered 1 case of crime against person, 3 cases of crime against property, and 6 cases of crime against local Acts. A-Division Police Station registered 1 case of crime against person, 5 cases of crime against property, and 26 cases of crime against local Acts. B-Division Police Station registered 5 cases of crime against person, 18 cases of crime against property, and 17 cases of crime against local Acts. C-Division Police Station registered 2 cases of crime against person, 7 cases of crime against property, and 15 cases of crime against local Acts. D-Division Police Station registered 5 cases of crime against person, 10 cases of crime against property, and 18 cases of crime against local Acts. E-Division Police Station registered 3 cases of crime against person, 30 cases of crime against property, and 5 cases of crime against local Acts. F-Division Police Station registered 1 case of crime against person, 20 cases of crime against property, and 5 cases of crime against local Acts. G-Division Police Station registered 11 cases of crime against person, 10 cases of crime against property, and 7 cases of crime against local Acts. Ganmo-Division Police Station registered 1 case of crime against person, 7 cases of crime against property, and 8 cases of crime against local Acts (Figure 7).

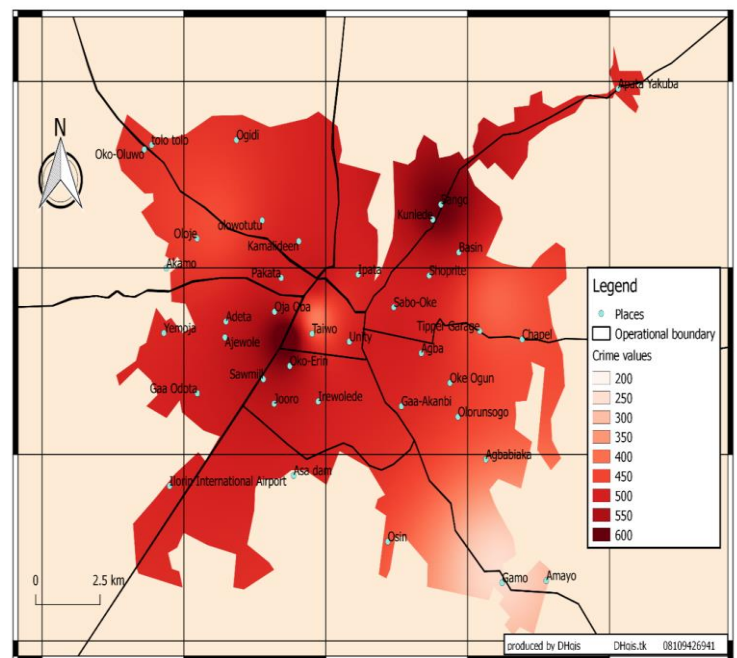


Figure 8: Crime hotspot in Ilorin metropolis



The study however revealed that the highest cases of crimes against property where in sector 4 and 2, this may be because of the high number of students present in this location. Here, misplacing, stealing, armed robbery, demand with menace are most common especially from cultist. Also, sector 1 recorded the highest occurrence of crime against local act probably because of the high vehicular traffic flow in the area as high traffic areas are usually accompanied with higher traffic offenders. Crime against person is however in sector 8 which was probably because of the consistent community fights in the area, or the over stretching of the police facility. There was only one station that monitors sector 7, 8 and 9.

Crime Zones in Ilorin Metropolis

Computation and queries were carried out to demonstrate the usability by create area that tag as Hotspot and cool spot respectively. A crime hotspot is generally defined as an area containing dense clusters of criminal incidents (<http://www.geospatialworld.net>). Identifications of hotspots help public safety institutions to allocate resources for crime prevention activities. This geographical analysis was made based on crime recorded by the Police. The total number of crime cases reported between 2006 and 2016 were summarized to three thousand nine hundred and one (3,901) in different places and Ilorin metropolis has total number of nine operational sectors (9).

Figure 8 shows the combinations of the reported cases of 2006 to 2016 (layers). The hotspot areas in the ten years review are Oja Oba, Oko-Erin, Sango, Kunlede and Oyun. While Ganmo is the safest place with the least crime rate. The study also revealed that crime rates are increasing from the center of the metropolis outward with the town growth. It was revealed that the level of crime reduces outward as Ganmo and Tolotolo appear more peaceful than the center the other outskirts of the town however may be different because of the presence of growth pole facilities such as airport and tertiary institutions.

Relationship between the Spatial Pattern of Police Facilities and Reported Criminal Activities

The buffered map of police facilities of the study area (figure 6) was overlaid on the crime hotspot map (Figure 8). This was analyzed and a map of buffer zones of police stations and crime zones derived (See Figure 9). The study revealed that police facilities were arranged in such a way to combat crime, it also reveals that the pattern of the positioning of this facility is not in the plan of the city but rather a function of the crime intensity. I.e. a new

division will be created in an area with high crime just to reduce the crime.

Factors that Explain the Spatial Pattern Observed

The interview held with the personnel of the research and planning unit at Kwara state police command headquarters revealed that unemployment (there are people that commit crimes when they are unable to earn good standard of living to meet their needs), rural-urban migration (that people believing that there are better employment opportunities in the metropolis, move to the urban centers/cities and end up becoming nuisance when their hopes are not meet) and drug abuse factors (as drugs and addictive tendencies influences other variable factors to work. Criminals use drugs as aid to commit crimes) are the major factors contributing to the pattern of crime in the metropolis and that positioning of police stations is a very complicated process as there are no laid down rule or indicated in the master plan of the city where police stations should be located. Police stations are usually located randomly where there is available land and when there are resources.

Conclusion and Recommendations

The study revealed that the pattern of distribution of police stations in Ilorin metropolis are randomly and unevenly distributed with a little clustering at the center, and as one moves away from the center, the sparser the police stations become. The neighborhood analysis of the area given is 0.733, as such, ascertains the randomness in the distribution of the police stations in the metropolis. The study also shows that there are eight Police Stations within Ilorin metropolis. They are; Divisions A, B, C, D, E, F, G, and Ganmo division other facilities like the Mobile Police office, Police training school and police state headquarter which has seven departments, CID etc. and that the police outpost that used to exist in the built-up area are now mostly inactive. The spatial pattern of crimes against property tend to be clustered towards the outskirt of the city, areas around Oyun, Ipata, Kunlede, Kwara Polytechnic environs, Tanke, Fate and University of Ilorin environs, this could be as the result of large presence of youth as the areas are close to the major higher institutions and there are enough manpower and facilities/equipment for police activities in those area. It was also discovered that the spatial pattern of crimes against local act tended to be clustered towards the center of the city around areas like Challenge, Post office, Emir Road, Unity Road, this could be as the result of lots of vehicular traffic as the area is the central business district of Ilorin metropolis. The hottest spots in the metropolis are Oja Oba, Oko-



Erin, Sango, Kunlede and Oyun. While Ganmo is the safest place with the least crime rate i.e. is a cool spot.

Recommendations made based on the researcher's findings are to point the way forward on the part of the town planners, estate managers, investors, Nigerian police force, Kwara state command, Kwara state government and the federal Government. Actions should be put in place to examine the factors to be considered in the distribution of police stations and personnel, since population according to this study is not a considerable factor. Also, Geography is under estimated in the police force, which contemporarily, is to a large extent responsible for the inability of the police to prevent and control the alarming rate of crime and criminal activities in the society. Therefore, this discipline should be made one of the criteria to meet before the recruitment of new personnel, while those on board should undergo serious training on how to utilize its application for a smooth service delivery. More security formations should be established within the metropolis as this will help reduce crime. This was revealed by findings that areas with more security formations and infrastructure have lesser crime compared to areas with fewer security formations and support facilities such as worship centers, markets, schools, commercial center, petrol stations and recreational facilities should be mandated to consider police station or district police posts (where applicable) within its proposed site.

Security operatives should engage in the modern method of carrying out their activities by adopting and integrating GIS methodology as this will help the force to be proactive in their operations and the use of GIS technology will be of great significance to the law enforcement agency, as it will serve as a tool for decision support system for policy makers by providing a frame work for improving quality of service delivery, and efficient policing, thus making the police react quickly and proactively. This will enhance safety of lives and properties as well as provide a favorable business environment within the metropolis. There should be provision of GIS laboratory for data handling within the police information system, regular capacity building of police personnel based on the use of this geospatial technology should be considered seriously, provision of navigation vehicles and GPS facilities for effective tracking and acquisition of digital map for every city in different coverage and layers.

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