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GEOGRAPHICAL APPROACH TO SURROUNDING SECURITY CHALLENGES IN NIGERIA

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ABSTRACT

Over the years, the state of insecurity in Nigeria has been on the increase. High race of crimes such as kidnapping, armed robbery, assassination, theft, arson among others have been on the increase, leading to loss of lives ant/properties. Due to lack of adequate modern technology, insufficient manpower, the Nigerian state has not been able to effectively tackle insecurity in the country. Various vigilante groups have thus been put in place to check these menaces arising from insecurity of lives ant/properties. However, these security checks have failed to provide the needed solutions to these problems. Geographical approach through the use of Geographical info, nation System (GIS) graph theory, aerial photographs, mapping, satellite images/ road connectivity networks as tools of geographical studies are means in which 5ecurity lapses can he checked and managed in Nigeria. These have many applications and promote efficiency if properly applied. Therefore crime analysis using the above geographical methods is today relevant in Nigeria, as it will go a long way to surmounting security challenges in the country.
Keywords: surmounting, Challenges, Security, Checks, Methods, insecurity.

Introduction

Insecurity continues to be a major concern in our society. *Most* countries of the world are faced with unacceptable levels of delinquency and insecurity. In many developed and developing countries, crime rates continue to rise. The international crime victim survey on data collected from Africa, Asia, Europe, Latin America and parts of Australia showed that for the period 1989 -1996, more than half of the urban populace, have been affected by one form of insecurity or the other (Ackerman and Murray, **2004).** It was reported that high crime rates are normal features of life all over the world, its existence is as old as man. On its part, man has always sought ways on how to address the issue of crime and reduce **it** to its barest minimum. The occurrence of criminal activities in the form assault, homicide, kidnapping, theft, assassination among others, is something that takes place every day in almost all parts of the world, especially in Nigeria. in the present dispensation, that is from **2000** till date, the rate of crime occurrence grew sharply to nearly an epidemic level particularly in the urban centres of Nigeria clue to population explosion as a result of a stark economic inequality and deprivation, poverty, unemployment, poor social infrastructure and incapability of law enforcement agents in the country (Murray, **2001).** This wave of criminal activities is unattractive to both local and foreign investors and this is the present situation in many parts of the country. The Nigerian security agents are not particularly proactive in forecasting the occurrence of crime in the country; thus leading to a state of insecurity and loss of lives and properties. The situation calls for urgent attention, hence the need to examine its spatial spread and tendency in the face of world security and peace.

The spatial analysis of crime across the country **is** unevenly spread, though some geographical regions are noted for the prevalence of some terrorists groups, the need to arrest the trend calls for a geographical approach, hence this study. Several factors including the lure of potential

targets and simple geographic convenience for an offender influence where people choose to break the law Fajemirokun, Adewale Idowu, Oyewusi and 7s.Aaiyegun. zoo6). Therefore, geography plays an important role in law enforcement and criminal justice, particularly its location, sequence, mode of operation, religion and political attachment. Including cultural influence. Criminals move from one place to the other and live in the geographical space hke every other human being, hence geographical approach to surmounting security challenges in Nigeria underscores-the need for this study.

Prevailing Trend

The age-old system and traditional method of criminal record maintenance and intelligence has failed to live up to the requirements of the existing crime wave in Nigeria today. Manual processes neither provided accurate, reliable and comprehensive data for combating the rising wave of crime in the country) or does it help in trend prediction and spatial spread of criminal activities. The resultant effect is low Productivity and ineffective combating and utilization of manpower and security agents. Crime waves continue to rise and spread. Lives are loss and properties destroyed by criminals on a daily basis. The solution to this problem lies in the effective use of information technology. A geographical approach to surmounting security challenges can be used by the police and other security agents through the geographic information system, to plan effectively for emergency response, map areas of crime, predict movement of criminals and predict future events. Geographical approach through geographic information system (GIS) can also be used, to get critical information to emergency situation and to dispatch security agents to emergency situation and to dispatch security agents to distress calls, or while enroute to an incident to assist in tactical planning response. However, these have not been achieved, as a result of the non-inclusion of geographical studies in crime detection and security checks in planning and combating crime in the country. This neglect of studies has negative impact on security, resulting in the inability of security aspects to effectively check the wave of crime in the country. It is therefore imperative that a study be conducted to fill in the observed gap, hence this study is undertaken.

Aim and Objectives of the Study

The aim of this study is to examine the use of geographical approach in surmounting security challenges in Nigeria. Therefore, the objectives shall be;

1. To assess the use of maps as attribute database containing names of streets, types and purpose to building as well as street linkages with a view to aiding security agents to mapping out the scene of crimes and to facilitate quick response to distress calls.

2. To build a road network connectivity to assist security agents get to a scene of crime through the shortest possible route.

3. To map out the type of crime, location, time and period and to produce a sequential chart of these crimes.

4. Suggest ways on how to check security challenges in the country, hence minimizing the rate of crime in Nigeria.

Scope of the Study

The use of geographical method such as Geographical Information *System* (GIS) technology in mapping out areas of insecurity in a country is a rapidly expanding field, but still in a development stage, with a number of technical issues which remained to be solved. This paper will only give an overview of how geographical methods can be used as analytical tools to surmount crime rate in Nigeria using Delta State and Urban Ughelli as a case study.

METHODOLOGY
in carrying out a proper analysis of the trend of crime occurrence in the area of study, there was the need to delineate the area into a number of zones based on existing component units - house clusters, economic status and general dwelling characteristics. The area was thus subdivided into five zones. The zoning was done using the roads as guide and area of plots enclosed by each zone. For the purpose of this study, these plots represent crime scenes or potential crime scenes. -

These zones are:

1. Uloho Avenue and environs (Zone 1): Uloho Avenue is a modern post colonial area situated in the southern part of the town (taking our bearing from the central post office). The area is moderately populated, welt planned with good quality houses. The area is predominantly residential. It represents quite fairly a middle income group x area of Ughelli. The area is well served by relatively urban sanitary facilities such as septic tanks and water supplies from shallow wells and boreholes as is the case with Ughelli generally.

2. Over bridge area and environs (Zone 2): This area lies to the north of the town. It covers the main market and the population density in this area is quite high, but **it** also fluctuates between extremes due- to the migrating nature of their occupants. Based on visual assessment, most of the area is relatively unplanned with some areas tending to slum location especially around the streets surrounding the main market. This trend sterns from an inadequately controlled scramble for space and a bid to maximize land use, even though finance is inadequate.

3. Upper Afiesere and environs (Zone 3): This area is situated in the east of the study area. The area is densely populated. Some of the area is largely unplanned, such as the Okorodafe street axis and devoid of modern basic facilities because of its pre-colonial timing. There is also very little spacing between buildings. The area can best be described as a slum. There is the predominance of pit latrines and flush toilets including unkept and unmaintained septic tanks in the vicinity. In the other parts of the area, the Iwhrekpokpor axis, the area is fairly well planned. It is a newly developed residential layout with good quality houses. **It** represents a fairly high income group area. **It** is welt served with relatively sanitary facilities but water supplies **are** irregular, the people there still depend more on supplies from shallow well dug in the area.

4. Sergeant quarters and environs (Zone 4): *This* area lies to the **south-east of** the study **area.** This region is a modem **post** colonial area with modern houses. The **population** density is a little above average. The area is well planned with sanitary facilities. Poor and erratic water supply from state government owned water services led to the development and construction of individual's shallow wells and bore-holes in the area.

5. Government Reservation Area (GRA) and environs (Zone 5): This area covers the traditional cores of the town and houses most state government owned establishments. The traditional core areas can be considered as an area of high population density except for GRA, hospital and police station areas.

They are pre-colonial and characterized by narrow roads with inadequate drainage facilities consisting mainly of refuse choked makeshift gutters. The buildings here are of older generation generally dilapidated and densely packed. The same applies to the limited available sanitary facilities; Indigenous people predominately occupy this area. The occupants are mainly traders and workmen. In the greater GRA area consisting of government institutions and government houses the area is considered a modem low density area. The roads are poorly developed and covered with low shrubs and scattered trees. Houses are situated in spaced compounds with individual's sanitary facilities and enough space for access.
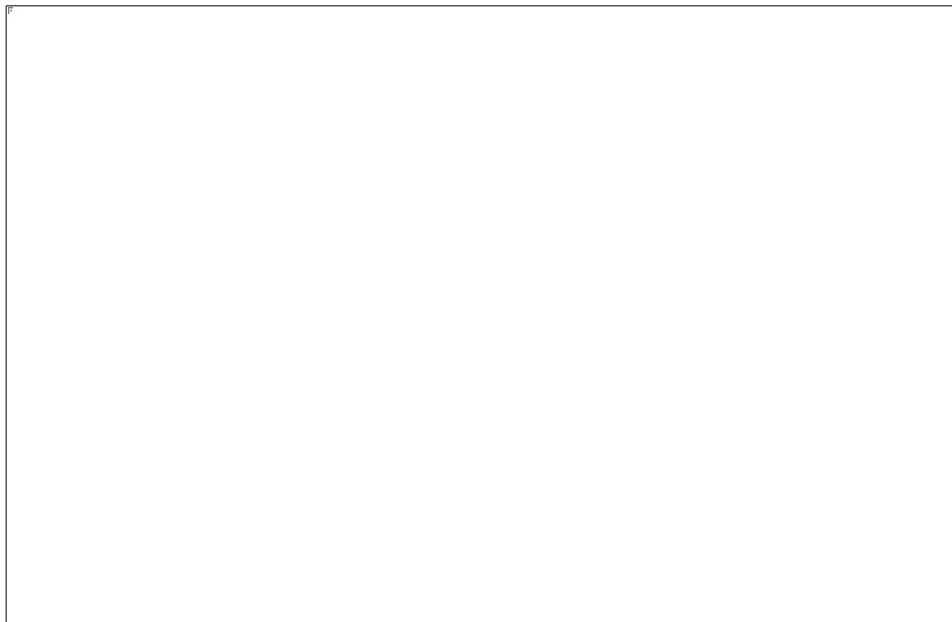
A1so, the graph theory technique was used to assess the structure of the road network in the area. This was done in line with the works of Betty **(1961),** Kansky (1963) and Leung 1982 using geometric components of the network **in** order to determine the shortest possible route in terms of distress calls. Hypothetical examples were also built to define crime location or zones to determine crime scenes in the course of this study. This was done to demonstrate the usability of this study for mapping purposes by the various security agents in combating crime.

Result and Discussion

A hypothetical analysis was built in this study **to define and** determine the level of **network** connectivity of the study area using the graph theory as a geographical approach to **arrest** a robbery in one of the streets in the area. The topological graph of the sampled streets in Ughelli, Ughelli South Local Government Area, Delta State shows a total of 20 vertices and 32 edges

(See figure 1). In order to determine the level of road network connectivity of the area three structural indices were used. These are the Alpha index ( ), Beta alpha B) and

By definitions; $= \dfrac{C - V + P}{2V\text{-}5}$

Where
C = Number of edges
V = Number of vertices
P = Number of sub-graphs of the network

The alpha index is the ratio between the observed number of circuits and the maximum number of circuits in a given graph.

The Beta index is given by:
$$\dfrac{C}{V}$$

That is number of edges over the number of vertices. Thus, the beta index measures the relationship between two individual elements of the network. The Gamma index (v) is indicated as:

The gamma index is a quotient of the observed number of edges to the maximum number edges, applying the above formulae, the alpha index for the road network in Ughelli is:

$\dfrac{C = V + 5}{2V - 5}$

$\dfrac{32 = 20 + 1}{2\,(20 - 5)}$

$\dfrac{32 - 20 + 1}{2(15)}$

$\dfrac{12 + 1}{30}$

$\dfrac{13}{30}$

=0.433

While the Beta index is:
$\dfrac{C}{V}$

$$\frac{32}{20}$$

$$= 1.6$$

And the Gamma index is:

$$\frac{C}{3(V - 2)}$$

$$\frac{32}{3(20 - 2)}$$

$$\frac{32}{3(20 - 2)}$$

$$\frac{32}{3(18)}$$

$$\frac{32}{54}$$

$$Y = 0.592$$

From the above, it implies that the alpha value of **0.433** is less than which signifies chat the networks have a decreasing degree of connectivity. A beta value of **1**.6 shows that a greater number of vertices, Also, a gamma index of **0.592** shows that the area is not properly connected **by** roads) hence it becomes difficult to monitor crime, in all, insecurity in the area is high because of poorly developed roads which act as hindrance to proper crime combating in the area. In hypothetical example 2, the security agents have been notified about the crime or robbery taking place at Ahoro Street presently and needs to know the location and the shortest possible route to the scene of the robbery. An **AUTOCAD** map through CIS can first locate the crime scene and then determines the shortest route from the police station to the scene. This can also be done through the road network connectivity matrix as shown in table **1.**

Table 1: Road Network Connectivity Matrix to the Police Station.

		Cemetery	Afiesere	Akpodiete	Edoge	Olori	Okorodafe	Ahoro	Mission road	Isoko road	Post office	Iwhreko	Oniemo	Adonovwe	Osia	Omotor	Police station	Nodes Total
1.	Cemetery	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
2.	Afiesere	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
3.	Akpodiete	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	2
4.	Edoge	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	1	4
5.	Olori	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
6.	Okorodafe	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
7.	Ahoro	0	0	0	0	0	0	-0	1	0	0	0	0	0	0	0	0	0
8.	Mission road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
9.	Isoko road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Post office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Iwhreko	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2
12.	Oniemo	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
13.	Adonovwe	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	3
14	Osia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
15.	Omotor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
16.	Police station	1	0	0	0	1	0	0	1	1	0	0	0	0	1	0	1	5

Source: Fieldwork, 2013.

In order to assess the road network accessibility during distress call, road collectivity approach can be applied as shown in table 1. The structural indices for each of the streets can be determined. The density of the network which spells out the compatibility of roads to show how closely1 they can quicken the flow of movement of security agents when called upon was also knitted in the network. Thus, the network density of the streets under investigation shows that Ughelli like most urban centres in Nigeria have compact networks, hence a threat to security in the country. However, through proper network analysis, the issue of crime monitoring and investigation can he solved geographically through space. Also1 areas of high risk of crime can be mapped out through aerial photographs. This can be performed through the location of the area in a particular map. Thus, a flood trace analysis can be carried out to display alt routes within the town from a centrally located place can be employed to determine and map out areas of crime in a place.

Findings

The study discovered among other things that understanding the spatial distribution of phenomena on the earth's surface helps identify potential suspects to increase investigators suspect base when no leads are evident. Thus response capabilities often rely on a variety of data from multiple agencies and sources. The ability to access and process information quickly while displaying it in a spatial and visual medium allows agencies to address issues of security

challenges quickly and effectively. In the nature of the law enforcement agents, the location of a crime is crucial to its investigation. Geographical approach through GIS helps co-ordinate vast amounts of location based data from multiple sources. It enables the user to create layers for the data and view the data most critical to the particular, issue. Thus, potential crime sites with unrelated criteria can be examined geographically by crime officers by displaying them all in a graphical, layered, spatial interface or map. It also enables them map inmate populations, fixtures and equipment to provide for the safety of inmates by separating violent members from the others, identifying high-risk areas and hazardous locations in an area. Geographical approach can also be used as an investigative method that uses the location of a connected series of crimes to determine the most probable area of the residence of the offender from the multiple lots. It serves as the building block for several investigative strategies including address based searches of security operatives and surveillance.

Recommendations

Based on the findings of this study, the following recommendations are made:

i. Geographical approach to crime detention is necessary for all security agents. Thus, it is strongly recommended that GIS departments be set up in all police stations and other security outfits in the country to provide spatial analysis for resource allocation and investigative planning.

ii. Security posts in urban centres should be centrally located for easy accessibility.

iii. Patrol Units of security agents should be equipped with Global Positioning Systems so that their locations could he known for easy response.

iv. Crime data should be made available especially on the Web for easy assessment in order to know areas of high crime rate in the country and how to check such crimes.

Conclusion

Geographical approach to surmounting security challenges through the use of C IS has been successful in many developed countries of the world. As a result, the use of CIS, aerial photographs spatial mapping and management are indispensable to surmounting security challenges in Nigeria. Geographical approaches can be used to map analyze crime occurrences with a view to arresting the factors responsible for such crimes. With GIS security agents can produce maps showing scenes of crimes and the shortest possible **routes** to surmounting such criminals. Thus, security challenges in Nigeria can best be addressed through effective mapping of crime area with the aid of base maps which can also be used to forecast and map out strategies for proper crime management in Nigeria.

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