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PERCEPTION OF COMMERCIAL MOTORCYCLE OPERATORS ON ROAD TRAFFIC ACCIDENT IN MAKURDI, NIGERIA

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Abstract

Overtime, there has been an increase in cases involving commercial motorcycle traffic accidents in Makurdi though there are no reliable data on location of accidents areas by relevant agencies in the state. The study examines the perception of commercial motorcycle operators on traffic accidents on hotspots areas in Makurdi, Benue State. The objectives of the study were to: (i) identify the locations of traffic accident as perceived by commercial motorcycle operators in Makurdi (ii) examine the perception of commercial motorcyclists on causes of traffic accidents in Makurdi (iii) determine the accident hotspot as perceived by commercial motorcyclists in Makurdi (iv) examine the effects of traffic accident on commercial motorcyclists in the study areas and (v) determine how commercial motorcyclists' involvement in traffic accident could be reduced in the study area. Data for the study were sourced from survey through questionnaire administration and related documents on government agencies, relevant text books and journals. A systematic-random sampling technique was employed in the selection 268 respondents in the 45 BEMOA units in Makurdi. Descriptive statistical techniques including tables, charts, graphs and percentages were employed to analyze the characteristics of commercial motorcycle operators, causes and effects of road traffic accidents. Location of traffic accident scenes were identified using Global Positioning System (GPS) device. The coordinates were later integrated into ArcGIS 10.7 software. The findings of the study revealed that (i) traffic accident occur at major routes and streets in Makurdi particularly at route nodes and intersections (ii) These traffic accidents occurs mostly in built-up areas where there are presence of institutions and commercial centers such as public markets, motor parks, schools, social and religious centers (iii) The major causes of commercial motorcycle traffic accident in the study are obstruction, weather condition, over-speed, improper overtaking, non-compliance to traffic rules and drug substance abuse (iv) Most commercial motorcycle operators are affected by traffic accident including job loss, psychological trauma, loss of property, debt and fracture. The study concluded that there is need for government agencies and other stakeholders in the transport sector to collaborate and adopt the recommendations suggested in this work in order to reduce traffic accident in Makurdi and beyond.

1. Introduction

Transport is an indispensable element of development and socio-economic growth of any society the world over. It is an engine of economic integration and a precondition for facilitating trade and the movement of goods and persons. Important means of overland transportation include railways, motor vehicles (cars, Lorries, buses) as well as motorcycles, tricycles and bicycles (otherwise known as para-transit). Others include the use of animals (camels, donkeys and horses), and animal drawn carts. The importance of transportation in a particular territory, locality or country, perhaps lead to a statement by Mundy (1968) that ‘there is no escape from transport’.

Johnson and Adebayo (2011) noted that motorcyclists constitute an important group of road users globally. In many Low Income and Middle Income Countries (LMIC), motorcycles are increasingly becoming common means of transport. In Nigeria, commercial motorcycles constitute one of the most important modes of transportation and by far, the most common form of informal transport system. There has been a phenomenal increase in the use of motorcycles for commercial purposes in most cities and rural areas of Nigeria in the last few years. Premium times (2014) reported that the National President of Motorcycle Riders Association claimed that the association has a total of eight million registered commercial motorcycle riders as members.

Motorcycles are an increasingly common means of transport. In Nigeria, commercial motorcycle constitutes one of the most used modes of transportation and by far, the most common form of informal transport system. There has been a phenomenal increase in number of people involved in the commercial motorcycle operations due to increased rate of unemployment and economic hardship, lack of sustainable public transport among others. This

underscores the importance of commercial motorcycle as a lucrative business for operators, it reaches areas where commercial vehicles may not reach due to bad road, it is available and flexible in price to the vast majority of the people that utilizes it as a means of commuter transportation.

In as much as commercial motorcycle have contributed greatly to the socio-economic development of people in the study area, it is plagued with road accidents which occurs on streets and roads of Makurdi particularly at nodes and intersections with its attending consequences such as deaths, severe injuries and damage of properties. The reported prevalence of motorcycle injuries varies around the world, from 22.8% in China (Zhang, 2004) to as high as 62% in Vietnam, (Nantulya and Reich, 2002). In Nigeria, prevalence of motorcycle injury ranges between 12.8% and 60% as reported in different studies (Okedere, 2004; Nzegwu, 2008). Apart from death and injuries, road accidents slow down economic development of most countries. Relatedly, Yushau (2010) noted that Nigeria losses \$6.2 billion yearly to road crashes. The amount translates to about 12% of Gross Domestic Product and about 17% of the current foreign reserve. He also lamented that many of the people who died as a result of road crashes were in their active years between 25 years and 45 years.

Traffic accidents involving commercial motorcycle have been on the increase in Makurdi over the years. The continuous increase in accidents is believed to be as a result of many factors among which include; configuration of the road, poor or absence of operational education, non-compliance to traffic rules, over speeding, faulty break, tire burst, bad roads, drugs and substance abuse, poor traffic control and management, distractions, weather condition among others. It is noted that these accidents occur mostly at some specific locations around Makurdi.

Despite this burgeoning problem, there was near absence of data from Federal Road Safety Corps (FRSC) or Nigeria Police Force (NPF) on precise location of motorcycle accidents where researchers and other stakeholders in traffic management can adopt to address issues of accident hotspots, prevention and management in the study area. Therefore, the researchers focus is that if a perception study is carried out among commercial motorcycle operators in the study area to identify traffic accident areas, then it will serve as a base for further research for accident hotspots involving motorcycles in the study area.

2. Study Area

Makurdi is located between Longitudes $7^{\circ}35'$ and $7^{\circ} 50'$ North of the equator and between Latitudes $8^{\circ} 25'$ and $8^{\circ} 40'$ East of the meridian (Figure 1). It is a 16km radius circle covering 804km² landmass. Makurdi is comprised of eleven council wards namely; Mbalagh, Agan, North Bank 1 and North Bank 2, Fiidi, Wailomayo, Baa, Modern Market, Ankpa/Wadata, Clerk market and Central/South Mission. Makurdi is bounded by Gwer West Local Government Area to the west, Gwer East Local Government Area to the South, Guma Local Government Area to the North East and Doma Local Government in Nasarawa State to the North. It serves as a major link between the Northern and Southern parts of Nigeria. Makurdi which is today known as the capital of Benue State is situated on the bank of River Benue. It came in to existence in 1927 following the transfer of the headquarters of the Benue Province from Abinsi. Makurdi retained its status as the provincial headquarters until 1968 when the provincial administration was abolished. However, following the creation of Benue State from the then Benue-Plateau in 1976, Makurdi became the State capital and the administrative Headquarters of Makurdi Local Government Area.

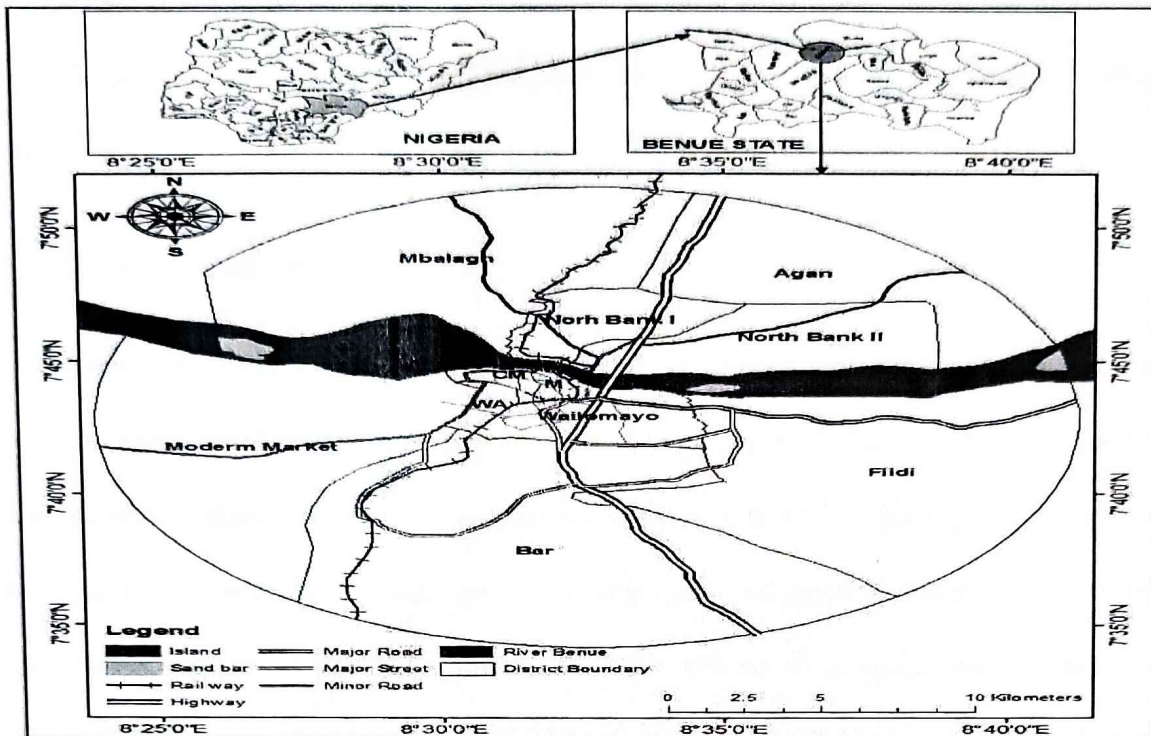


Figure 1: Greater Makurdi Area

Source: Adapted from Benue State University GIS Laboratory, 2023

Makurdi is the most developed town in Benue state. It serves as both the Benue state capital and administrative headquarters of Makurdi Local Government Area. According to National Population Commission (1991) the population of Makurdi was 239,889. Projected at a growth rate of 0.03%, $[Pt=239,889 (1 + 0.03)^{31} = 599,742]$, Makurdi has a population of 599,742 in 2022. Shabu (2021) noted that Makurdi has a fast growing population with a population density of 323 persons per square kilometer which is about 8.14% of the entire population of the state.

The population is made up of the Tiv speaking population as the majority, others are the Idoma and Igede speaking population with other ethnic groups that are relatively few.

The dominant activities in the study area and its environs are agriculture, commerce, small and large scale industries, tourism, recreational areas and transportation. Many primary, secondary and tertiary institutions are also found in the area. According to Awopetu (2013) Makurdi is the

main location of commercial activities and it serves as a local trade centre for agricultural products (sesame, rice, cassava, millet, yams, cottons, soybeans, groundnuts, oranges, mangos and livestock).

3. Research Methods

Data for the study was sourced from Primary and Secondary data. The primary data was sourced through administration of questionnaire and focus group discussion. A well-structured questionnaire was administered to commercial motorcycle operators at their various units using random sampling techniques. Information on the socio-economic characteristics, traffic accident areas, causes of accidents, nature of route, effects of accident was sought from commercial motorcycle operators in the study area. The secondary source of data was sourced from the Benue State Ministry of Works and Transport and GIS Laboratory of Department of Geography Benue State University Makurdi. The review of literature was sourced from journals, textbooks and relevant articles on the internet. The sample frame was 15,426 representing the total number of registered commercial motorcycle operators in Makurdi from 45 units spread across the study area. This work adopted the formula used by Cochran (1963) to obtain sample of 268 as shown in Table 1 below.

Table 1: Sample Size

BEMOA Unit	Number of Registered Operators	Sample Size
Abu	233	4
Akpehe	221	4
Angbaaye	211	4
Benue Links	587	10
Benue Hotel	227	4
Benue State University Gate	641	11
FMC Apir	291	5
FMC Wadata	322	6
High Court	248	4
High Level Market	412	7

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High Level Market	412	7

International Market	464	8
Judges Quarters	204	4
Kenvilla Park	423	7
Lafia Garage	407	7
Lafia Junction	298	5
Logo 1	335	6
London Line	452	8
Mbagwen	253	4
Modern Market	568	10
NASME Market	286	5
New Bridge	421	7
NITEL	237	4
North Bank Market	432	8
Nyijir	218	4
Plaza Hotel	223	4
Pleasure Travels Park	468	8
Psychiatric Hospital	246	4
Savannah Bus Stop	242	4
Secretariat Main Gate	244	4
Secretariat North Gate	270	5
SRS Junction	357	6
Swange Cinema	426	7
Terwase Agbadu	232	4
Tipper Garage	288	5
TSB	275	5
Tyo-Mu	231	4
Tyoshin Park	359	6
University of Agriculture	471	8
Village Market	346	6
Wadata Market	521	9
Welfare Quarters	278	5
Wurukum Market	562	10
Yaman park	458	8
Yaikor Market	291	5
72 Battalion	257	5
Total	15,436	268

Source: BEMOA, 2023

The questionnaire was administered using random sampling techniques. This was done by allocating numbers to each motorcycle operators in each unit. The respondent for each unit was then selected by picking randomly one after the other until the sample size for all the units were selected. The data were analyzed using tables, cross-tabulations, percentages, graphs. ArcGIS tool and trend analysis were used to show the accident hotspot in Makurdi

4. Results and Discussion

Socio- economic Characteristics of Respondents

The socio-economic characteristics of respondents revealed that all the 263 respondents representing 100% are male and no female (see Table 1). The ratio could be as a result of the nature of the business where it is culturally viewed that commercial operators should be men. Also the risks and nature of hazards involved has placed a socio-restriction on the female gender to involve in the business. Similarly, the age distribution of the respondents revealed that majority 42% and 30% of the respondents are within their peak of productive age with high energy of youthfulness and mostly falls in ages where risks taking is generally accepted as a norm. However, less than 21% fall within the very matured age where risks taking is reduced and most probably have other means of livelihood and therefore, engage less in commercial motorcycle business or would have employed the services of the younger folks to take over some other motorcycles they have purchased. The marital status of the respondents showed that from the 263 respondents, majority (56%) are married while 31% are single and 9% are divorced and 4% are widowed. The high percentage of married respondents here is connected with unemployment where commercial driving is seen as an alternative to taking care of commercial motorcycle operator's family and dependents through school, health needs, clothing and shelter. The influx of singles in the commercial motorcycle business which comes next here could be as a result of unemployment and lack of sponsorship to further with education. Majority who falls under this category are self-sponsored in various educational institutions and as well helping in the sponsorship of their family members in schools and taking care of their aged parents. The approximate daily income in naira of most motorcycle commercial operators show that out of 263 respondents, majority (43%) earns between

N5,000-N8,000 daily while (41%) earn less than 5, 000. Meanwhile, some (10%) earn between N8,000-N10, 000 and a few (6%) earn above N10,000. This implies that those who earn N8,000 and above are those who have stayed many years in the motorcycle commercial business and have earned long trust from passengers by running either family/private businesses for their customers. While those who earn daily income of less than N8,000 are mostly those who are less than four years in to the business but struggle to meet both family and private needs (see Table 1)

Furthermore, majority (54%) of the respondents had secondary education while 19% of the respondents had either tertiary or primary education respectively and only 8% of the respondents had no formal education. The influx of secondary and tertiary graduates into the commercial motorcycle operation could be as a result of either high cost of education transiting from secondary to tertiary education and as well as non-availability of well-paid job opportunities for graduates alike in the study area. Hence, their major concern could be to earn a daily living and take care of their immediate needs and that of their families. This finding agrees and support earlier studies of Adebayo (2011) who noted that many men are abandoning menial jobs and becoming commercial riders due to unemployment and the urgent need to meet with daily wants.

Pattern and Causes of Commercial Motorcycle Accidents in the Study Area

The distribution of traffic accidents in Makurdi showed that they are not evenly spread as some areas have higher traffic accident than others. The red colour indicate areas with very high traffic accident while the orange, yellow, green and blue colours show traffic accident locations with high, moderate, low and very low respectively (see Figure 2)

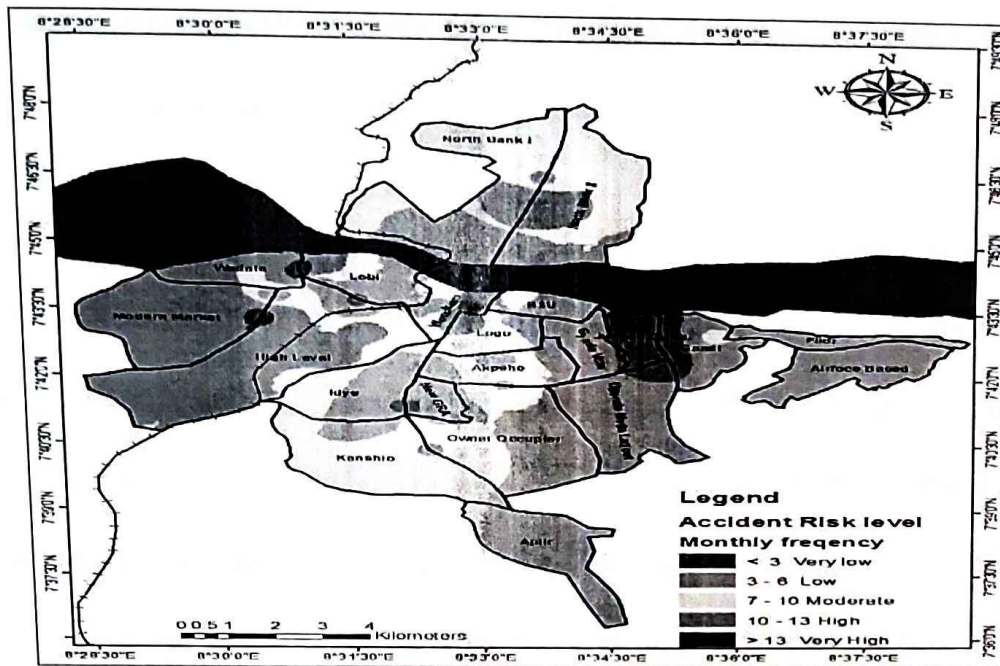


Figure 2: Pattern of Traffic Accidents in Makurdi

Source: Authors Fieldwork, 2023

The causes of traffic accident involving commercial motorcycle operators in Makurdi. revealed that 78 (30%) had accident due to obstruction of stationary parking, water pipes, emergency break from other vehicle or emergency entrance on the road of either motorcar or motorcycle. Also, 51 (19%) of the respondents) claimed that weather conditions either as a result of heavy rainfall or poor vision during harmattan and this collaborates Gbadamosi (1997) view that human beings occasionally place obstructive materials on the highways including broken vehicles, stones, electric poles, blocks and failure to seal up water pipe trenches after completing the reticulation of water pipes across a road. Finally, there are environmental factors like gullies, erosion, slippery surfaces, fog, and rain that blur visibility.

This finding reveals further that over speeding 48 (18%) of the respondents claimed that induced accident occurred due to operators' impatience and hurried nature to drop passengers and hustle for money especially over the weekends and occasionally during Christmas, Sallah and easter periods. Furthermore, 38 (14%) of the respondents were of the view that improper overtaking of operators often results to accidents 9see Figure 3). This agrees with

Ogunmodede et al (2012) study that affirmed that over speeding ranked highest among other factors which causes accidents in Nigeria

Furthermore, 10% of the respondents agreed that noncompliance to traffic rules could be attributed to accidents; and this may be as a result of absence of training of operators by professionals and near absence of enforcement of traffic laws by government institutions such as Federal Road Safety Corp (FRSC), Nigeria Police Force (NPF) and Benue State Ministry of Works and Transport. This contradicts Johnson and Adebayo (2011) recommendation that the increase in knowledge of road safety signs through simple training will benefit motorcyclists. This has become necessary because of the influx of inexperienced operators in their numbers who hurriedly joined the business in order to make a living and this agree with the report of the Federal Road Safety Corp (2016) that puts accidents rate due to motorcycles riding especially in developing countries like Nigeria at an alarming rate yearly.

Figure 3 further revealed that drug substances abuse accounted for 8% and this may be connected to the influx of youths between ages 18-35 who are vulnerable to be influenced by their peers to this nefarious act. It was noted that the most important aspect of the human factor in traffic accidents involving commercial motorcyclists are the age of the motorcyclist, medical fitness of the motorcyclist, alcoholic consumption pattern, fatigue, mental status and educational level (Oladebo and Brieger, 1996; Odera, *et al.* 1997; Lin et al, 2003; Sexton et al 2004; Elliot Baughen and Sexton, 2007). Most commercial motorcycle operators indulge in this act of alcoholic and substance intake with the conviction to energize themselves to overcome fatigue and work tirelessly to earn income to for domestic use including feed their families, rent, hospital bills and payment of school fees and as well meet the demands of friends and extended family member

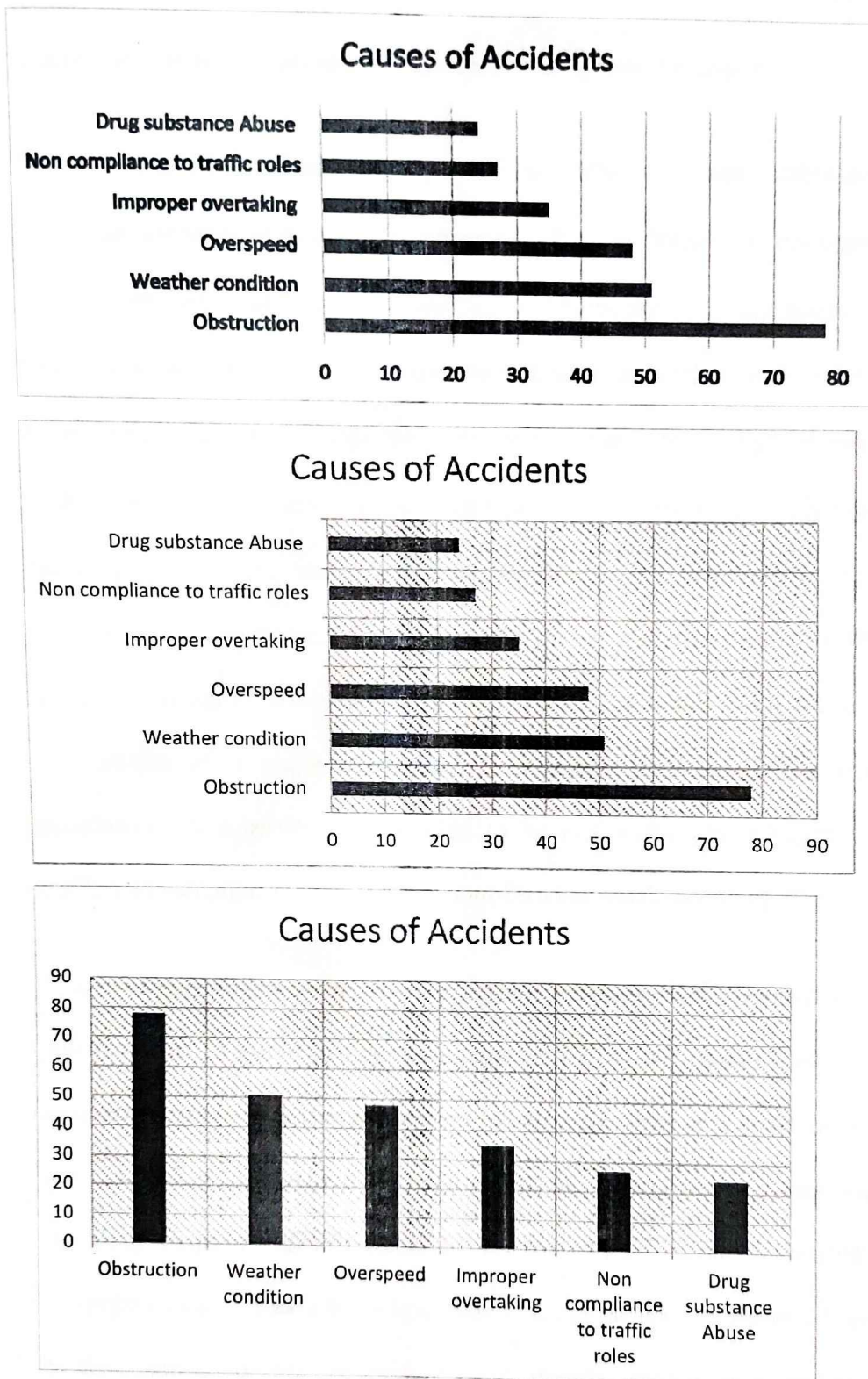


Figure 3: Causes of Traffic Accident
Source: Authors Fieldwork, 2023

Perception of Respondents on Accident Hotspot in Makurdi

The results in Figure 3 show analysis of areas that have high traffic accidents in Makurdi involving commercial motorcycle operators. The red dotted line represents the critical mean value where any spot beyond it signifies a hotspot but anything below means areas of low traffic accident. This agree with the earlier submission of Gholamali et al.(2022) that described hotspots as areas where traffic accidents occur within 100m length of route twenty (20) times in three years and 6 times in a year. Figure 3 show that Benue Links junction in Makurdi have recorded 16 (sixteen) traffic accidents as claimed by respondents signifying the highest accident peak. This could be as a result of high vehicular movement in Wurukum area where there is presence of Wurukum market, Living Faith Church and a Nursery School as well as the park hub of all major transportation companies in Makurdi. The presence of Wurukum roundabout which serves as a major link to the north and southern Nigeria too add up to several traffic and vehicular movement that could lead to traffic accident.

This is closely followed by Benue Crescent junction, FMC T-junction and Modern market junction with 12 traffic accidents as responses from the respondents. The reason for traffic accident occurrence at Benue crescent junction could be as a result of its location at a sharp bend as well as high vehicular movement in the closely built-up area where it houses major electronic shops in Makurdi. Relatedly, the reason for high rate of accident at FMC T-junction in Wadata area of Makurdi could be due to the presence of a Federal Medical Center located by the junction and the presence of major pharmaceutical shops in Makurdi situated in the area. More so, there is a presence of Government Girls College and Holy Ghost Catholic Church at Wadata- Makurdi. This area witnesses high vehicular movement due to the various

activities taking place in the area. Also, the causes of traffic accident here could be as a result of the presence of recreation and entertainment centers like MaCafa Park and Garden, Rocoy Event Center and Makurdi Modern Market where there is high level of social and economic activities which attracts large number of people.

Yaman Park in Wurukum- Makurdi 11 respondents were of the view that traffic accidents occurred in the area. This may be connected to its closeness to Wurkum Market and its surrounding of fuel stations and over five commercial banks located along the ever busy Makurdi- Oturkpo road which is a narrow stretch where hawkers and motorcars and motorcycle block major portion of the road leaving a small portion for human and vehicular activities.

Swange Cinema, SRS junction, Lafia junction, Our Lady Catholic Cathedral and Katsina-Ala Street junction have 10 respondents each. Swange Cinema is located besides Wurukum Market along Makurdi- Oturkpo road and reasons for high traffic accidents could be due to high vehicular movement as well as the its closeness to one of the outlets of the Wurukum Market where sellers and buyers of perishable goods ply and this results in accident from commercial motorcycle operators especially through obstructions and distraction along the route. SRS junction adjoins the Lafia route and links Joseph Sarwuan Tarka University (former University of Agriculture, Makurdi), Akawe Torkula Polytechnic Makurdi and Special Science Secondary School Makurdi where there is high vehicular and human movement especially at peak hours of 7:00am – 9:00am and 4:00pm – 7:00pm and most especially when schools are in session and this junction is the hub for bus terminal and commercial operators' unit where traffic accidents are high. Lafia junction is in a close proximity with SRS junction and it leads to North Bank market and other places and as well

as adjoins Lafia Road and the junction too like SRS junction witnesses high vehicular movement and serves as a bus terminal and as well as a make shift park where driver's heavy duty vehicles park for rest and this causes high traffic accident at the junction.

Our Lady Catholic Cathedral Gate has an intersection where commuters' particularly commercial motorcycle accident occurs probably due to the presence of the ever busy religious center as well as the federal road leading to Ankpa in Kogi state. Katsina-Ala Street is located at High-Level part of Makurdi and it houses a big market for the sales of telecommunication mobile phones, laptops and other accessories. The ever busy Katsina-Ala Street experience high vehicular inflow and outflow and this results to serious traffic accidents especially at the node intersecting Old Oturkpo road.

BSU First Gate, High Level Market and Central Mosque junction have 9 respondents each. BSU First Gate has a U-turn leading to Benue State University, Makurdi with (a religious center) St. Thomas Catholic Church Anum- Makurdi sited directly opposite the University along the Makurdi-Gboko route that experience high human and vehicular movement causing traffic accident at this point. There is also the presence of a T- junction located 15 meters away from the BSU U-turn intersecting Gboko road behind Customary Court of Appeal Makurdi where commercial motorcycle operators drive against the traffic for easy access to Wurukum area through BSU First Gate U-turn and this result to traffic accident. High-Level market is sited at a high urban area of Makurdi and shares neighbourhood with the ever busy Ibrahim Babangida (IBB) Square and JS Tarka Foundation where major events in Makurdi and Benue State at large take place. The High-Level market has a large sphere of coverage where people within the area and beyond patronize the market for their various needs and this results in to a high vehicular and human movement where people park their vehicles and motorcycle on

both sides of the road leaving a narrow space for commuters resulting to traffic accident. The Central Mosque junction is located at Wadata area of Makurdi where apart from religious function from the Central Mosque major supermarkets and shops of different kind adjoining Wadata market are and this also results to high vehicular and human movement resulting to traffic accident at this junction.

Alhaji Commasi junction and Federal Pay Office Sharp Bend have 8 respondents each. Alhaji Commasi junction intersect the busy Makurdi Modern Market Road and it links Wadata area as well as Demekpe community of Makurdi. The Alhaji Commasi junction experience high traffic accident due to the rush of vehicular at human movement to and fro the Modern market. Federal Pay Office Sharp Bend located along Jonah Jang Road has a road alignment describe to be sharp bend or curve but with good asphalting where most vehicles and commercial operators over-speed considering the smoothness of the route and this results in to traffic accident on the sharp bend location.

Welfare Quarters junction and Yina junction have 7 respondents each. Welfare quarters is located along the New Makurdi- Oturkpo Road where the Quarters was built as a Housing scheme for civil servants in the state. The quarters has opened up the area with a high built-up of residential, schools and farms and the major route for entry and exit is through the junction intersecting Makurdi-Oturkpo narrow and busy route which causes traffic accident for motorists. Yina junction intersects George Akume way adjoining Owner Occupier quarters, Nandi Schools, Vaatiav College and Makurdi International Market. The route is smooth and road alignment solid with high vehicular and human movement causing traffic accident and this collaborates with Anyanwu et al (1997) who noted that good roads do not in itself prevent accidents.

Coca-Cola junction, Touring Tots junction and Wadata Sharp Bend have 6 respondents each. Coca-Cola junction is along Makurdi-Gboko road where Coca-Cola products are produced in commercial quantity and experience high vehicular and human movement of people who trope in and out of the company for various transactions and this causes traffic accident at the junction. Touring Tots junction is along the Makurdi-Oturkpo road where Touring Tots; a high class Private Nursery School is situated along HEMCO hospital and residential area. The junction is busy particularly at school peak hours of 7:00am and 2:00pm thereby causing traffic congestion and accident at the junction. Wadata Sharp bend is located in Wadata part of Makurdi in a well built-up area where the road is smooth and some commercial operators over-speed without caution and end up in a traffic accident. Gholamali et al.,(2019) noted in their study on hotspot noted and agree with this findings that these spots are usually found in certain areas of the road, such as crowded intersections and sharp curves. According to Australian Department of Transportation and Economy the locations are classified as hotspots or black spots after identifying the risk level and the probability of an accident occurrence in each location occurrence. Identifying hotspots help traffic authorities to alleviate crashes by finding appropriate solution.

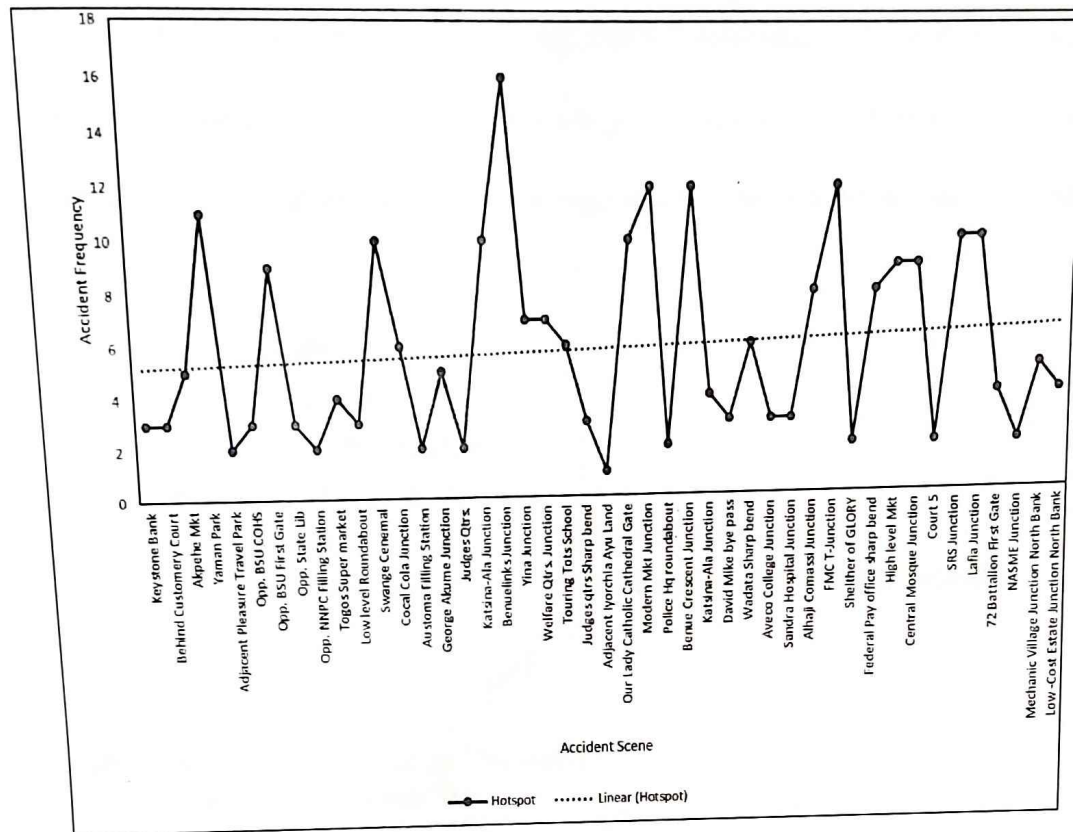


Figure 4: Accident Hotspots in Makurdi
Source: Authors Fieldwork, 2023

Effects of Traffic Accident on Commercial Motorcyclists

The effects of traffic accident on commercial motorcyclists as revealed in figure 4 showed that 39.2%, 30% and 11.7% were affected with laceration, job loss and psychological trauma respectively. Others include 10.6% had loss of property by selling to take care of medical bills 5.3% and 3% had disability. The rate and various degrees of injuries in this study was posited by Amine and Edem (2022) that injuries are almost inevitable when a motorcycle is involved in an accident, especially when it is a head-collision. Adekunle (2010) opinion collaborates further with the findings of this research that the cost to society such as loss of able bodied men and women who hitherto, would have been involved in productive economic activities are inestimable. Again, valuing the psychological impact on victims is another difficult task.

Issues like suffering and loss of life and injuries associated with road traffic accident is difficult to assign monetary value. According to Onakomaiya (1992) with injuries, people often suffer physical pain and emotional anguish that is beyond any economic compensation.

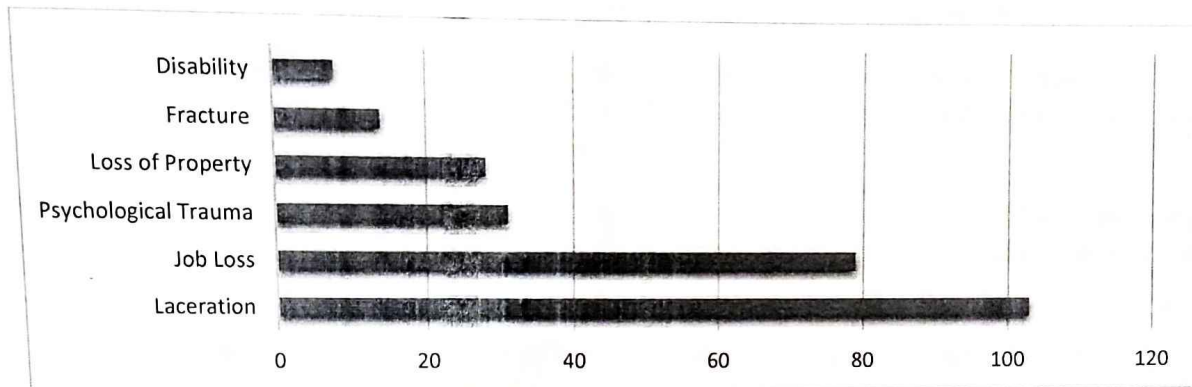


Figure 4: Effect of Accident on Motorcyclist

Source: Authors Field Work, 2023

5. Conclusion

It is clear that the institutions charged with the responsibility to provide data of road traffic accident in Makurdi do not have adequate data on commercial motorcycle traffic accident by locations. The perception study on commercial motorcycle operators in Makurdi will serve as a data base for further research on accidents locations and hotspots study in Makurdi and beyond.

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