

# EVALUATION OF THE EFFECT OF 2022 FLOODING ON BUSINESS ACTIVITIES IN LOKOJA METROPOLIS

## Abstract

Flooding is has become a global issue and its effect varies with the level of flooding at a given period. Flooding is one of the negative effects of global warming and most countries in the world are making effort to reduce its associated effects. This study used a survey research design and Analysis of Variance (ANOVA) regression analysis to evaluate the effect of flooding on business activities of residents in Lokoja metropolis. The study showed that 2022 flooding exerts negative and significant effect on education system, business activities, religious activities and electricity supply. Also, it was revealed that small businesses were mostly affected than large businesses. The study therefore recommends that enactment of laws against building or citing of businesses along flood route. Also, artificial embankments should be created along banks of rivers and tributaries of rivers to avoid overflow of river to residential and business areas.

**Comment [JK1]:** Abstract is not comprehensive enough. Show the major components of an abstract

The abstract too needs to be re-written following the conventional scientific writing, to capture in a snap shot, the introduction, objectives of the study, methods used, sample size and selection criteria, results, conclusion and recommendations of the study in between 300-500 words

**Key Words: Flooding, Household, Business Activities,**

## 1. Introduction

One of the notable causes of ecological and human harm is flooding. According to Allaire (2018) and Parida (2019), it has an impact on the ecosystem, impairs public health, creates unemployment, and impacts socioeconomic conditions. In the wake of urban floods, public and commercial institutions are currently finding it difficult to develop and assess risk management and adjustment methods that include land use planning and urbanization patterns in addition to systems for flood prevention and early notifications. Nonetheless, there are significant challenges for policymakers around the world in mitigating the impact of natural disasters. As a result, compared to developing nations, countries with stable economic structures and administration have reported lesser socioeconomic damages and fewer deaths (Anbarci et al., 2005; Kahn, 2005).

**Comment [JK2]:** Sentence too long and losing direction....consider rephrasing.....also cite the authors if not your own .

**Comment [JK3]:** Who said this??? Cite

Onyedinefu (2022, ~~October 24~~) reporteds that the recent floods have caused immense difficulty for locals and even travelers traveling along the Kogi axis. Major roadways and transit routes, including the Abuja-Lokoja highway and the Lokoja-Koton-Karfe road, experienced severe traffic congestion for many days as a result of the floods. Thousands of trucks carrying gasoline and perishable goods were left stranded as a result, which caused shortages of fuel in Abuja and

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other parts of the nation and caused losses for company owners. The devastation caused by the flood also extends to small enterprises, especially Micro, Small, and Medium Enterprises (MSMEs). Home to hundreds of thousands of businesses, Lokoja is an important commerce route to Southern states. Business owners in the state and city have lost a great deal of money because the floods have not only ruined their goods but also severely disrupted economic activity. According to data from the 2020 MSME survey report, there are 938,740 businesses in Kogi. It was discovered that the ten LGAs that are submerged under water have a high population density for these enterprises (Onyedinefu, 2022, October 24).

**Comment [JK6]:** Who said this??

**Comment [JK7]:** Consider rephrasing this statement.....its too vague

According to official data from the State Emergency Management Agency (SEMA), the floods in Kogi state affected an estimated 5,550 pupils and at least 1,380 schools. Numerous locals surveyed by Kunle (2022) confirmed that the flooding occurs every year and that the damage caused by the flooding in 2022 is still the worst since 2012. It follows that future flooding in the area may be much more severe due to the effects of climate change. About 80% of Nigeria's floods, according to Minister of Water Resources Suleiman Adamu, are caused by rainfall. According to experts and ecologists, inadequate drainage systems, dredging, and dams, among other infrastructure facilities, are contributing contributors, along with climate change.

**Comment [JK8]:** Which report or journal reported this ??.....and when did it be published???

**Comment [JK9]:** Cite the source and year.....

**Comment [JK10]:** Cite the source of this information....

While the floodwaters in a few of the villages we visited in Kogi State receded, the locals bemoaned the total destruction of their homes and agricultural land. According to information obtained by Kunle (2022), this has prompted the locals and fishermen to flee to the homes of relatives in the cities of Koton-Karfe and Lokoja. Others have taken up residence in Internally Displaced Persons Camps (IDPs) located in a number of primary schools dispersed throughout the state. More so, the 2022 flood had a significant negative impact on the education system in Lokoja City. Since the school buildings were being used as camping grounds for the displaced households, the majority of the schools in Kogi state were closed. The elderly and children were subjected to severe conditions as a result.

**Comment [JK11]:** Are you reporting your results here or it is still the introduction? ...consider deleting this from here it is misplaced.

In view of the problems caused by the 2022 flooding and the likelihood of having another flooding in the area as announced by experts, it becomes so imperative to evaluate the effect of 2022 flooding on the socio-economic activities of households in Lokoja Metropolis to ascertain

**Comment [JK12]:** This seems to be a follow-up of the first statement on your findings in the first line of this paragraph above, yet you cite Kunle (2022).....so when was your study conducted?? Which one came first? Kunle or yours? .....consider rephrasing this entire paragraph

the extent of damage and to proffer possible solutions to avoid future occurrence of flooding in the area.

## 2. Literature

Floods are the deadliest natural calamity on Earth, destroying more property and taking more lives than any other natural event (Leadership, 2023). Data from the World Food Programme (WFP), Tellier Research, and the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) indicate that at least 3.5 million of the five million people affected by flooding in Africa are Nigerians.

The school management had just rung the bell announcing the conclusion of the day's academic activity when students from Ozi Primary School in Koton-Karfe town, Kogi local government area, dashed to the assembly ground for the closing prayer. However, a somber Zakariya Ajara remained motionless fewer than 50 meters from the happy students, waiting for the kids to move on (Kunle, 2023). One of the numerous victims of the floods that wrecked homes in Kogi State is Ms. Ajara, a 40-year-old fish vendor who sought safety in the Koton-Karfe Primary School. Even though the widow's life has been difficult since her spouse passed away, she claimed that the floods have made her socioeconomic situation worse.

Globally, flooding has really distorted business activities at varying degrees thereby causing significant losses, including stock and assets. Company inventory, vehicles, fixtures, and fittings, and valuable machinery can be damaged beyond repair. Small businesses are more vulnerable to natural disasters compared to larger establishments due, in part, to their inability in the short term to quickly adapt to extreme circumstances (Davlasheridze and Geylani, 2017). Further, there are concerns that increased severe weather events from growing climate volatility will disproportionately and negatively impact small businesses as a result of the higher degree of natural disaster vulnerability. While federal and state governments emphasize local community preparedness to help address this increased risk, there may also be polarization between community members and local authorities in terms of implementing disaster protection measures (Henderson *et al.*, 2020). At the same time, it is necessary that all community stakeholders, including local small businesses, are engaged in community resilience plans for such plans to be effective (Begg *et al.*, 2015).

**Comment [JK13]:** What is the source of this information? ....this sounds like recommendations from findings...are we there yet? ...cite the source and rephrase your paragraph.....develop a logical flow of your writing.....

**Comment [JK14]:** What is this? Journal or author.....scientific writing follows conventional standards.....please follow them

**Comment [JK15]:** Provide the source and year of the publication

**Comment [JK16]:** Sounds more like a news paper article than academic journal.....consider rephrasing.....also what is the connection with the first paragraph and which literature are you reviewing here...??? Consider deleting this .....

**Comment [JK17]:** This statement is not flowing with the previous and requires re-phrasing o suit the purpose here...

**Comment [JK18]:** Cite source

**Comment [JK19]:** Cite source

**Comment [JK20]:** Who raised these concerns? ??...

Much of the literature exploring the impact of natural disasters on small businesses relies on post-disaster surveys to better understand factors that contribute to small establishment resiliency (Danes *et al.*,2009; Marshall *et al.*,2015; Runyan, 2006). ~~Key~~Findings show that poor planning on the part of the small business, local area infrastructure issues, disruptions to the business cash flow, externalities from federal assistance, and barriers to access recovery-related capital negatively impacted establishment resilience in the wake of a natural disaster (Runyan,2006). In addition, women-owned, minority-owned, and veteran-owned businesses appear more likely not to survive a natural disaster (Maria *et al.*,2015). ~~However~~, establishments that were older, larger in size, with owners who had greater industry experience and owners with prior experience navigating natural disaster, were more likely to survive.

**Comment [JK21]:** Re-arrange starting with the earlier year to the latest

~~We only~~ ~~f~~The researchers found a small number of studies that examined the longer-term impacts of natural disaster events on US small businesses while also considering a range of industries in the affected region (Xiao, 2011; Xiao and Drucker, 2014). These studies explored the longer-term effects from natural disasters, specifically the 1993 Midwest Flood, on the local economy. The ~~overall~~ findings were that the longer-term impact of flooding on local economies was negligible (Xiao, 2011), and this was especially true in regions with greater economic diversity (Xiao and Drucker, 2014). However, the effect on the agriculture sector was negative and for longer term for some communities (Xiao, 2011).

**Comment [JK22]:** CITE SOURCE

In many parts of the world, flooding is the leading cause of losses from natural phenomena and is responsible for a greater number of damaging events than any other type of natural hazard (Smith, 1996; Kron, 2005), yet, floods seem to be part of the lives of most communities in the world particularly in developing countries. In Nigeria, the pattern is similar with the rest of the world. Floods ~~is~~are one a major environmental problem seriously affecting ~~the~~ cities and villages in recent times causing damage to property and loss of lives ~~in the country~~ (Ologunorisa, 2004; Ologunorisa ~~and &~~ Tersoo, 2006; Obeta, 2010).

~~There is~~ increasing vulnerability of populations and infrastructure to flooding and flood related hazards. Flood hazards are natural phenomena, but damage and losses from floods are usually, the consequence of human action (Doocy, et al., 2013). Unlike, other forms of flood, urban flood refers to the inundation of sections of urban areas which can be caused by a combination of high intensity rainfall and prolong rainfall leading to the development of flash floods (Gobo & Abam,

**Comment [JK23]:** Cite source

1991). Urbanization aggravates flooding by restricting where flood water flows into. Covering large parts of the ground with roofs, roads and pavements, obstruct sections of the natural channels and drains that ensure that water moves to rivers faster than it did under natural conditions.

As an area becomes “urbanized” or goes through the process of urbanization, there are increased flood risks that result due to human activities such as deforestation, building without plan and so on (Aderoju et al., 2014; Otomofa et al., 2015). As a result, even quite moderate storms produce high flows in rivers because there are more hard surfaces than drains. In the last 50 years, Benin City has witnessed a tremendous growth in population and area coverage. A prominent environmental problem associated with this expansion is flooding. Flooding affects numerous aspects of man’s environment. These include his economic activities; settlements and lifestyle. Several threats to livelihoods ranging from the physical threats to social and economic threats exist, while affected persons suffer some psychological effects.

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Economic measurements are difficult but they are much easier to make than estimating the disaster’s impacts on the emotional and social structures (West & Lenze, 1994). Studies have also attempted to quantify the lasting post-traumatic stress syndrome on individuals in disaster-impacted communities (Tobin & Ollenburger, 1996, Erickson, 1998). A study of suicide rates before and after disasters indicated that suicide rates rose 13.8 percent in the four years after floods (Krug, et. al., 1999). Olajuyigbe et al (2012) observed that flooding events are usually not limited to destruction of physical structures but are also accompanied with prevalence of diarrhea and other waterborne diseases as most sources of water are polluted. UNISDR (2005) ~~observed-reported~~ that the economic impact of natural disaster shows a marked upward trend over the last several decades. The ~~report furthernoted that~~ hazards tend to hit communities in developing countries especially the developed countries, increasing their vulnerability and setting back their economic and social growth sometimes by decades. ~~The f~~loods have led to loss of human life, destruction of social and economic infrastructure and degradation of already fragile ecosystems.

Small and Medium scale businesses have been found to be highly vulnerable to flooding and other natural hazards due to their inherent characteristics (Ingirige et al., 2008, Crichton, 2006). The impacts may have either directly or indirectly through damaged or lost stock, damage to

building / premises, damaged or lost building equipment, inability to conduct business, and inconvenience to staff.

The flood events caused significant disruptions to the business sector, especially small and medium-sized businesses (SMEs), which are often affected disproportionately hard by such events and are less prepared to manage the consequences (Crichton, 2006; Bmg Research, 2011). In Nigeria, while several studies have been undertaken to assess the environmental and socioeconomic impacts of urban flooding little attention has been given to impact of flooding on small and medium scale business and coping strategies (Otomofa et al., 2015; Olajuyigbe, et al, 2012; Aladelokun & Ajayi, 2014). This is in spite of increasing evidence of changing climatic pattern. This study therefore attempted to evaluate the impacts of urban flooding on business types and coping methods in Benin City.

**Comment [JK26]:** Re=arrange from earliest to latest

Butu, Ubachukwu and Emeribe (2021), investigated the impacts of urban flooding on small and medium scale businesses in Benin City. Ten locations including, BDPA quarter, Uselu market, Oliha market, Ekenwanquarter, Ogida quarter, Uwelu market, New Benin, Ikpoba Hill, Aduwawa, Upper Sakponba were purposively selected for the study due to previous flood experience. In terms of spatial dimension of impact, analysis showed that all the sample locations have similarly experienced various degree urban flood impacts in terms of disruptions of business activities.

### 3. Methodology

This study adopted survey research design. This enabled the researcher to gather meaningful data on the phenomenon for the purpose of reliability and generalization. The area of study was Lokoja, a city in Nigeria. It lies at the confluence of the Niger and Benue rivers and is the capital city of Kogi State. While the Yoruba (Oworo), Bassa Nge and Nupe are indigenous to the area, other ethnic groups of Nigeria, including the Kupa-Nupe, Hausa, Epira, Igala, Igbo, Bini/Edo, and Tiv., have recently established themselves, Lokoja is projected to be the third fastest growing African continent city between 2020 and 2025, with a 5.93% growth (Avery, 2021). It was listed a second-class township by the 1917 township ordinance of the colonial administration. This shows that Lokoja is an old city. Lokoja is also a Local Government Area of Kogi State with an area of 3,180 km<sup>2</sup> and a population of 195,261 at the 2006 census. It is

**Comment [JK27]:** You have already conducted the study...let the narrative be past tense....

bounded by the Niger in the north and east upstream from the capital until the border with Kwara State, and includes the city of Lokoja.

The current metro area population of Lokoja in 2023 is 839,000, a 6.07% increase from 2022. The metro area population of Lokoja in 2022 was 791,000, a 6.75% increase from 2021. The metro area population of Lokoja in 2021 was 741,000, a 7.08% increase from 2020 (United Nations, 2023). With this, the population of the study is 839,000. This permitted the researcher to adopt Yamane (1964) model for determining the sample size of a finite population and a sample of 400 households were used in the study.

~~The study designed~~ a questionnaire using five-Likert method of strongly agree, agree, neutral, disagree and strongly disagree and a benchmark mean of 3.0 was ~~established~~~~employed~~. On the spot filling of questionnaire was used to ensure the retrieval of all the questionnaires distributed. ~~In determining the reliability of the research instrument, a pilot study was carried out in which 30 questionnaires were administered on some of the respondents in the area of study, the result was coded and Pearson Product Moment Statistical test was used in analysis and a 0.82 reliability level was obtained before the instrument was used for the real study.~~

**Comment [JK28]:** Sentence too long.....consider breaking it to be more meaningful and clear...make it simple to read and understand

### Method of data Analysis

The study used mean and standard deviation to analyse the data while the hypotheses were tested using multiple regression analysis. The regression model to examine the extent to which 2022 flooding affected Business activities in Lokoja is specified as follow;

$$Busactivities = f(flooding, X) \quad (3.1)$$

Where business activity is proxy by the volume of sales during the flooding period,

And X stands for other factors that could affect business activities. This includes low patronage, High cost of goods, Small size of business, and Low quality of goods and services.

$$Busactivities_i = \beta_0 + \beta_1 flooding_i + \beta_2 lowpatronage_i + \beta_3 Ssizeofbus_i + \beta_4 Lqualityofgds_i + \beta_5 Hcostofgds_i + \mu_i \quad (3.2)$$

Equation (3.2) measures the effect of flooding on education system holding other variables constant. The values of  $\beta_1, \dots, \beta_5$  measure the slope of the parameters to be estimated. It is

~~was~~ expected that flooding, low patronage, small size of the business, low quality of goods and services and high cost of goods and services ~~should-would~~ exert negative effect on business activities. This model ~~was~~ ~~will~~ be estimated using the Analysis of Variance regression approach. This would help to reveal the effect of flooding on business activities in Lokoja Metropolis.

#### 4. Analysis and Presentation of Results

The study analysed ~~s~~ and interpreted ~~s~~ the data generated from the questionnaire distributed to residents in Lokoja, Kogi State. Section A was analysed using simple percentages while section B was analysed using ANOVA regression analysis.

##### 4.1 Background Characteristics of the Respondents

**Table 1: Percentage Distribution of Gender of Respondents**

		Gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	154	24.4	38.5	38.5
	Female	246	39.0	61.5	100.0
	Total	400	63.5	100.0	
Missing	System	230	36.5		
Total		630	100.0		

Author's Field Survey, 2023

Table 1 shows the percentage distribution of gender of respondents. It could be observed that 154 male and 246 female were sampled. This represents 38.5 percent and 61.5 percent respectively. The study shows that female respondents exceed male respondents by 92 (23%).

**Table 2: Percentage Distribution of Age Group of Respondents**

		Age group			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not more than 20 years	31	4.9	7.8	7.8
	above 20yrs but less than 40	225	35.7	56.3	64.0
	40 years and above	144	22.9	36.0	100.0
	Total	400	63.5	100.0	
Missing	System	230	36.5		
Total		630	100.0		

Author's Field Survey, 2023

Table 2 shows the percentage distribution of age of respondents. It could be observed that 31 of the respondents were less than 20 years representing about 7.8 percent of the total respondent. Also, 225 respondents were above 20 years but less than 40 years. This represents about 56.3 percent of the total respondents sampled in this study. Lastly, 144 respondents sampled were found to be 40 years and above. This represents about 36.0 percent of the total respondents sampled in this study. With this, it could be observed that greater percent of the respondents fall within 20 years and above. This shows that the quality of data generated from them would portray the effect of flooding on the socio-economic activities of the residents.

**Table 3: Percentage Distribution of Marital Status of Respondents**

		Marital status			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	107	17.0	26.8	26.8
	Married	273	43.3	68.3	95.0
	Divorced	20	3.2	5.0	100.0
	Total	400	63.5	100.0	
Missing	System	230	36.5		
Total		630	100.0		

Author's Field Survey, 2023

Table 3 shows the percentage distribution of marital status of respondents. It could be observed that out of the total respondents sampled, 107 (26.8%) were single, 273 (68.3%) were married and 20 (5.0%) were divorced. This further revealed that the study sampled more of married respondents than single or divorced. The implication of this is that these respondents would be more responsible and would actually account for the effect of flooding on their household.

**Table 4: Percentage Distribution of Qualification of Respondents**

		Qualification			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NCE/OND and below	157	24.9	39.3	39.3
	HND/B.Sc.	198	31.4	49.5	88.8
	M.Sc./ PhD	45	7.1	11.3	100.0
	Total	400	63.5	100.0	
Missing	System	230	36.5		
Total		630	100.0		

Author's Field Survey, 2023

Table 4 shows the percentage distribution of qualification of respondents. It could be observed that 157 (39.3%) of the respondents hold NCE/OND or below qualification while 198 (49.5%) hold HND/B.SC. the respondents that hold M.Sc. /PhD were about 45 (11.3%). This shows that greater percentage of the respondents hold HND/BSC. The implication of this to the study is that the respondents would supply rational information based on how they were affected by the flood.

**Table 5: Percentage Distribution of Job Type of Respondents**

		Job type			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Business	106	16.8	26.5	26.5
	civil servant	183	29.0	45.8	72.3
	Handiwork	79	12.5	19.8	92.0
	Transporter	32	5.1	8.0	100.0
	Total	400	63.5	100.0	
Missing	System	230	36.5		
Total		630	100.0		

Author's Field Survey, 2023

Table 5 shows the percentage distribution of job type of respondents. It could be observed that 106 (26.5%) of the respondents do business, 183 (45.8%) are civil servants, 79 (19.8%) do Handiwork while only 32 (8.0%) of the respondents are transporters. It shows that this study addressed the different job type available in Lokoja and as a result, the respondents' views would represent the true views of the entire population.

**Table 6: Percentage Distribution of Length of stay in Lokoja of Respondents**

		Length of stay in Lokoja			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not more than 2 years	2	.3	.5	.5
	more than 2yrs and less than 5yrs	168	26.7	42.0	42.5
	5 yrs and above	230	36.5	57.5	100.0
	Total	400	63.5	100.0	
Missing	System	230	36.5		
Total		630	100.0		

Author's Field Survey, 2023

Table 6 shows the percentage distribution of how long the respondents have stayed in Lokoja. This variable is added because it is expected that a respondent who has stayed for a longer time would possess more valuable information about the history of flooding most especially the 2022

flooding. It could be observed that only 2 (0.50%) of the respondents have not stayed in Lokoja for more than 2 years. Also, 168 (42%) of the respondents have stayed in Lokoja for more than 2 years but less than 5 years. Lastly, it was observed that respondents who have stayed 5 years and above in the area were about 230 (57.5%). The information available on table 6 shows that most of the respondents sampled have stayed in Lokoja for more than 2 years and as a result have adequate knowledge of the 2022 flood incident in the area.

**The extent to which 2022 flooding affected business activities in Lokoja**

The study evaluates the extent to which 2022 flooding affected business activities in Lokoja and the independent variables used include, quality of goods affected volume of sales, flood led to low patronage of customers, small size of business affected volume of sales, Flood affected Business activities, high cost of goods during flooding discourage customers. The dependent variable is the business activities. This was proxy by Business activities was going on smoothly during flooding. Table 7 shows the result of the effect of 2022 flooding on business activities in Lokoja Metropolis.

**Table 7: Effect of 2022 Flooding on Business Activities in Lokoja Metropolis**

**Table 7a. Summary of Model**

<b>Model Summary</b>				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.909 <sup>a</sup>	.826	.815	.03715

Author’s Field Survey, 2023

Table 7 (a) shows the Model summary of the effect of flooding on business activities in Lokoja. It could be observed that the correlation coefficient (R) of 0.909 shows that there is very strong but non-perfect linear relationship between the explanatory variables included in the model and the dependent variable. Also, the R-Square value of 0.826 shows that about 82.6 percent of the variation in business during period of study could be attributed to the explanatory variables. The small value of the standard error shows that the model is significant.

**Table 7b. ANOVA Result**

Model		ANOVA <sup>a</sup>			F	Sig.
		Sum of Squares	Df	Mean Square		
1	Regression	14.273	5	2.855	6.220	.032 <sup>b</sup>
	Residual	180.664	394	.459		
	Total	194.937	399			

Author's Field Survey, 2023

Table 7 (b) shows the ANOVA result of the effect of 2022 flooding on business activities in Lokoja Metropolis. The sum of squares from regression is 14.273 with 5 degrees of freedom while the sum of squares from residual is 180.664 with 394 degrees of freedom. It ~~could is be~~ observed that significant value ( $0.032 < 0.05$ ) of the F-statistic ~~shows indicates~~ that the model is significant at 5 percent.

**Table 7c: Regression Result**

Model		Coefficients <sup>a</sup>			T	Sig.
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	(Constant)	1.315	.390		3.367	.001
	2022 Flood affected Business activities	-.071*	.033	.067	-2.152	.012
	low patronage of customers as a result of flood	-.055*	.024	-.065	-2.292	.027
	High cost of goods during flooding discourages customers	.095**	.050	.109	1.901	.058
	Size of business	.069*	.032	.107	2.145	.033
	Quality of goods affected volume of sales	-.036	.044	-.041	-.818	.414

a. Dependent Variable: Business activities was going on smoothly during flooding

Author's Field Survey, 2023

\* sig. at 5 percent

\*\* sig. at 10 percent

Table 7 (c) shows the regression result of the effect of flooding on education. It could be observed that flooding of 2022, low patronage of customers as a result of flood and small size of Business affected volume of sales were found to be statistically significant at 5 percent while high cost of goods during flooding discourage customers was found to be significant at 10 percent. Quality of goods affected volume of sales was observed to exact insignificant effect on education system in 2022.

On the basis of the ceteris paribus explanation of the impact of each of the significant independent variables, the study found that holding other variables in the model constant, 1 unit increase in the volume of 2022 flooding would lead to about 0.071-unit decrease in business activities in 2022. The probability of 2022 flooding was found to be 0.012. This is an indication that flooding crowds out business activities in 2022.

**Comment [JK29]:** Consider deleting this phrase.....this is not in tandem with scientific writing ..rephrase

Also, low patronage of customers as a result of flood was found to exert negative but statistically significant effect ( $0.027 < 0.05$ ) on business activities in 2022. The study found that holding other variables in the model constant, 1 unit increase in the number of days of closure of schools would lead to about 0.055-unit decrease in business activities. This is an indication that low patronage of customers as a result of flood affected business activities in 2022.

**Comment [JK30]:** Only present you results here...don't discuss them. Consider deleting this statement

Similarly, the effect of business size was found to exert negative but statistically significant effect on business activities. The study found that holding other variables in the model constant, 1 unit increase in the size of business would lead to about 0.069-unit increase in the level of business activities during 2022 flooding. This shows that large business outlets benefit more during the flooding incident than small business outlets.

**Comment [JK31]:** Only present your findings here don't discuss them ...consider deleting this statement

**Comment [JK32]:** As comment above....consider deleting don't discuss findings yet

**Comment [JK33]:** •Construct the narrative of your findings in order to demonstrate originality and novelty  
•Show meaning, importance and relevance of your findings  
•Interpret the findings (attach meaning), provide implications (why the findings are crucial)  
•Place and weave your findings in existing body of knowledge in order to add a brick on knowledge generation.  
•Demonstrate your knowledge and understanding of the aspects studied in a broader context while providing some depth based on findings and existing literature.  
•Provide implications (practical/theoretical) of your findings.

## 5. Discussion and Conclusion

### 5.1 Discussion

The effect of flooding in Kogi state cuts across all aspects of socioeconomic activities of the households. The business sector was observed to be badly affected by the 2022 flooding. This study found a negative but statistically significant effect 2022 flooding on business activities. It further revealed that small businesses were mostly affected by the 2022 flooding than large businesses. This confirms the findings of Davlasheridze and Geylani (2017) who noted that small businesses are more vulnerable to natural disasters compared to larger establishments due, in part, to their inability in the short term to quickly adapt to extreme circumstances.

**Comment [JK34]:** This discussion is very swallow and does not bring out the matter.....a thorough discussion of every finding needs to be clearly articulated in comparison with previous literature reviewed and the researcher's position made. ....How different or similar are your findings from previous studies earlier reviewed in the literature review section??? .....this entire sub-section needs to be re-written as guided.

**Comment [JK35]:** For the Conclusion;  
•Restate the your argument based on the analysis of your data in relation to your hypotheses/research questions  
•Generate the bigger picture of your findings in relation to the introduction  
•State your patting shot (take home message) that the reader can remember.

### 5.2 Conclusion and Recommendations

Conclusively, flooding is one of the effects of global warming and most countries in the world are making effort to reduce its associated effects. This study evaluates the effect of flooding on socioeconomic activities of residents in Lokoja metropolis. The study used 400 structured

For the Recommendation,  
•Identify policy, further research, practice or theory issues in the findings that warrant recommendations  
•State the actions that you consider important to address a gap or issue revealed by your findings  
•Ensure that the recommendations are supported by your findings and there is a logical link with the conclusion.

questionnaires to examine the extent to which 2022 flooding affected education system, business activities, and electricity supply during the flood period. An ANOVA regression analysis was used to evaluate the objectives and the study found that 2022 flooding exerts negative and significant effect on education system, business activities, religious activities and electricity supply. Also, it was revealed that small businesses were severely affected than large businesses.

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**Comment [JK36]:** This conclusion from the discussion above needs to clearly come out with practical recommendations. ....consider deleting this whole paragraph and re-write following the guidance above. ....

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**APPENDIX I**  
**QUESTIONNAIRE**

Please tick as appropriate [ / ]

**SECTION A**

Gender: (a). Male [    ] (b). Female [    ]

Age group you belong to? (a). Not more than 20 years [    ] (b). Above 20 but less than 40 [    ]  
c. Above 40 years [    ]

3. Marital status? (a). Married [    ] (b). Single [    ] c. Separated [    ]. (d). Complicated [    ]

4. What is your academic qualification? (a). NCE/OND and below [    ] (b). HND/BSC [    ]  
(c). MSC/PHD [    ]

5. Employment type? (a). Business [    ] (b). Civil servant [    ] (c).Handiwork [    ]

6. For how long have you been in Lokoja?  
(a). Not more than 2 year [    ] (b). More than 2 years but less than 5 years [    ] (c). 5 years  
and above [    ]

**SECTION B**

What is the extent to which 2022 flooding affected Business activities in Lokoja Metropolis?

S/N	Item	SA	A	N	D	SD
7	Business activities in Lokoja was going smoothly throughout the flood period					
8	Flooding affected business activities in Lokoja					
9	Flooding led to low patronage of customers					
10	High cost of goods discouraged buyers during the flood period					
11	The small size of business outlet affected the volume of business activities during the flood period					
12	Low Quality of goods and services affected the volume of business activities					