

Assessment of Perception and Methods of Combating Flooding in Minna City of Niger State, Nigeria

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Abstract

Minna City has been experiencing series of flash flood due to freak rainfall with adverse effect on the psychological and physiological well-being of the residents of Minna City. It is evident that most of the respondents knew of the flood occurrence in their community. This study aimed at Assessing people's perception and Methods of Combating Flooding in the study area. To achieve the aim, these objectives were explored; to assess the perception of respondents on the impact of flooding occurrence and to determine the methods of combating flooding in Minna City. Research design method and Purposive random sampling technique were used. The researcher designed a structured questionnaire. Focus group discussion and interview were used to collect factual information from 2012 to 2021 for data analysis. The result of the study revealed that respondents have lived in the area for a period which is sufficient to enable them to supply relevant information regarding flooding in the selected areas within Minna City. The methods of combating flooding in Minna with current practices and structures have unwittingly increased the flood occurrence. It was concluded that flooding occurrence is a notable issue in Minna City. It is, therefore, recommended that the proactive disaster management and mitigation approach should be enhanced and strictly adhered to.

Keywords: Assessment, Perception, Methods, Combating, Flooding.

Introduction

Minna, like other Cities in Nigeria is regularly affected by natural hazards such as floods, erosion and droughts (Olanrewaju *et al.*, 2019). In 2012, Minna experienced a severe wide spread flooding that affected almost the entire Minna township (World Bank, 2014). Disaster management involves the coordination and integration of all activities necessary to build, sustain and improve the capabilities of communities to prepare for, protect against, respond to and recover from threats or actual natural or man-made disasters, (National Disaster Management Framework, 2010). Flooding is one of the natural disasters found in Minna. Flood is a result of many conditions working singly and in synergy. These conditions are mainly natural and anthropogenic. Natural causes of flooding are generally a result of heavy rain and downpour. The inhabitants of these communities are likely to differ in their perception, not only of risk, but also of the resultant disaster events and possibly their impacts. In the last three decades, the impacts of flooding have increasingly assumed from significant to threatening proportions, resulting in loss of lives and properties. Though detailed statistics are not available regarding the losses sustained by the urban dwellers and flood victims, it is obvious from the available record

that irreparable havocs have been sustained by the citizen of Nigeria due to what has become perennial natural disaster in our cities. Apart from houses that collapse by flooding, schools' buildings and bridges sometimes collapse as well. Today, despite improved knowledge of weather systems, the use of meteorological satellites and advanced computer simulation of the climate, urban areas are more exposed to climate extremes than ever before. While such extremes are becoming increasingly common as a result of vagaries of weather and climate, vulnerability has increased as well as population densities (IPCC 2001).

Today, despite improved knowledge of weather systems, the use of meteorological satellites and advanced computer simulation of the climate, urban areas are more exposed to climate extremes than ever before. While such extremes are becoming increasingly common as a result of vagaries of weather and climate, vulnerability has increased as well as population densities (IPCC 2001). Marginal land is increasingly used to grow inappropriate crops, leading to potential soil erosion and flash floods; Deforestation has denuded steep land of its protective vegetative cover; powerful machinery has made it possible to strip land of its vegetation in a fraction of the time that used to be required; and economic pressures on farmers to increase productivity through high input farming have led to unstable and unsustainable farming practices. Markets places and farmlands submerged for weeks and sometimes washed away. Hence flooding in Nigeria needs to be assessed. The unstable landforms coupled with deforestation, unplanned growth proliferation and non-engineered constructions makes disaster prone areas more vulnerable. Non preparedness, poor or no budgetary allocation for disaster prevention in developing countries makes them suffer more or less chronically from natural disasters (IFRCS, 2008). Minna City is not an exception of the aforesaid. In view of this, the author was motivated to carry out an Assessment of Perception and Methods of Combating Flooding in Minna City of Niger State, Nigeria.

Methodology

The population of the study comprised of flood victims of IDPs camp in Minna. The population figure is 638. The sample-size for the study was 144. Purposive random sampling technique was used. Structured questionnaire was designed by the author. Focus group discussion and interview were used to collect authentic information from 2012 to 2021 for data analysis. Simple percentage, mean statistic and t-test were used as methods of data analysis.

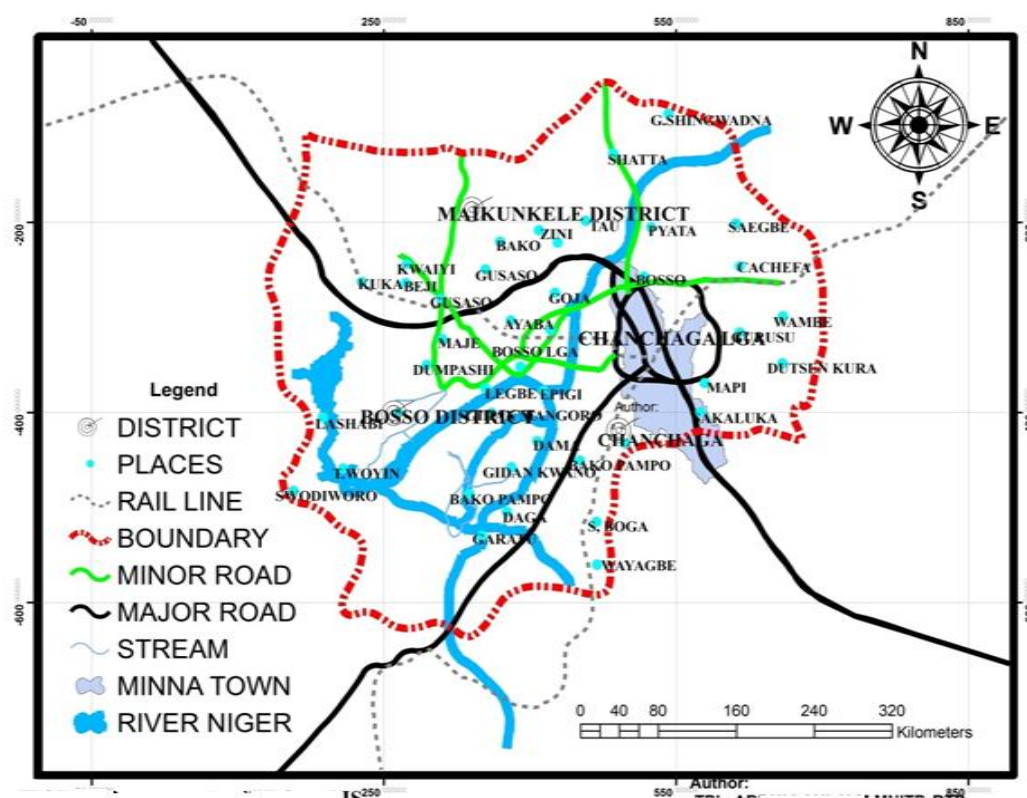


Figure 1: Minna Metropolis
(Source: Author's GIS environment work, 2022)

Findings, Results and Discussion

Hypotheses Test

H₀₁: There is no difference between male and female respondents on the perception of flooding occurrence period in Minna City.

Table 1: T-test on Perception of flooding occurrence in Minna City
Case Processing Summary

		Cases					
		Valid		Missing		Total	
	Gender	N	Percent	N	Percent	N	Percent
Perception of flooding occurrence period in Minna.	Males	10	100.0%	0	0.0%	10	100.0%
	Females	10	100.0%	0	0.0%	10	100.0%

Source: Author's Field Survey/SPSS, 2022

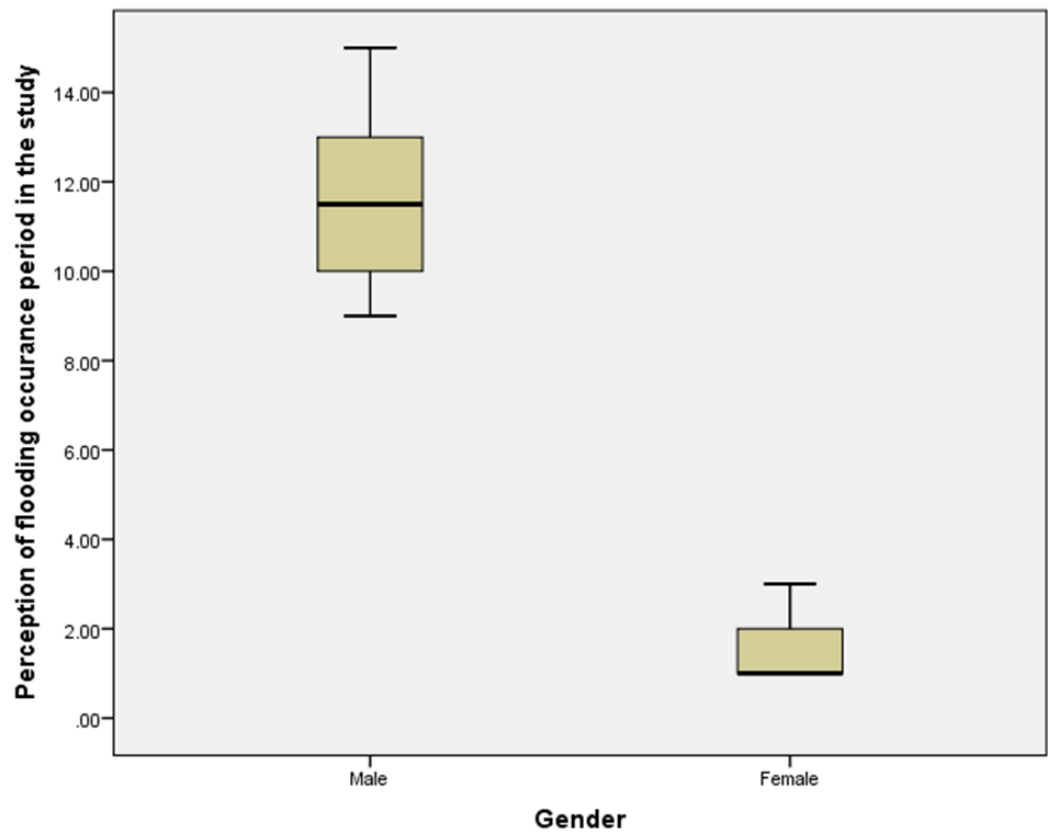


Fig. 2
Source: Author’s Field Survey/SPSS, 2022

Table 2: T-Test on Descriptive Statistics on Perception of flooding occurrence in Minna City

Gender		Statistic	Std. Error
Perception of flooding occurrenceMales period in Minna City.	Mean	11.6000	.70238
	95% Confidence Interval for Mean	Lower Bound	10.0111
		Upper Bound	13.1889
	5% Trimmed Mean	11.5556	
	Median	11.5000	
	Variance	4.933	
	Std. Deviation	2.22111	
	Minimum	9.00	
	Maximum	15.00	
	Range	6.00	

Interquartile Range	3.75	
Skewness	.481	.687
Kurtosis	-.969	1.334
Mean	1.5000	.22361
	Lower	.9942
95% Confidence	Bound	
Interval for Mean	Upper	2.0058
	Bound	
5% Trimmed Mean	1.4444	
Median	1.0000	
Females Variance	.500	
Std. Deviation	.70711	
Minimum	1.00	
Maximum	3.00	
Range	2.00	
Interquartile Range	1.00	
Skewness	1.179	.687
Kurtosis	.571	1.334

Source: Author's Field Survey/SPSS, 2022

Table 3: T-test on Independent Samples Test on Perception of flooding occurrence in Minna City

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Perception of flooding occurrence period in Minna City.	Equal variances assumed	10.047	.005	13.702	18	.000	10.10000	.73711	8.55139	11.64861
	Equal variances not assumed			13.702	10.806	.000	10.10000	.73711	8.47406	11.72594

Source: Author's Field Survey/SPSS, 2022

Decision Rule: Reject H_0 if $\alpha=0.05$ is greater than the p-value = 0.000.

Since $\alpha=0.05$ is greater than the p-value = 0.000, There is a significant difference between male and female respondents on the perception of flooding occurrence period in Minna City, therefore the null hypothesis is rejected.

H_{02} : There is no difference between male and female respondents on the methods of combating flooding in Minna City.

Table 4: T-test on Case Processing Summary on methods of combating flooding in Minna City

Case Processing Summary

	Gender	Cases		Missing		Total	
		Valid					
		N	Percent	N	Percent	N	Percent
Methods of combating flooding in Minna City	Males	10	100.0%	0	0.0%	10	100.0%
	Females	10	100.0%	0	0.0%	10	100.0%

Source: Author's Field Survey/SPSS, 2022

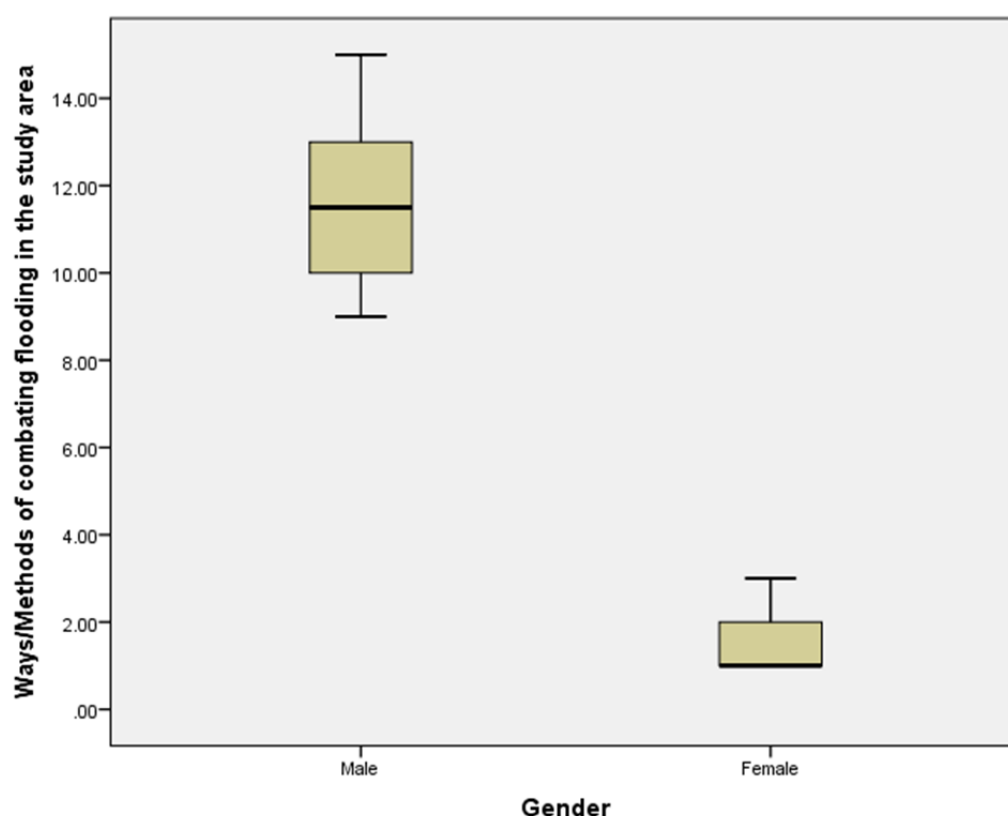


Fig. 3

Source: Author's Field Survey/SPSS, 2022

Table 5: Descriptive Statistics on methods of combating flooding in Minna City

Gender		Statistic	Std. Error
Methods of combating flooding in Minna City.	Males	Mean	11.6000 .70238
		95% Confidence Interval Lower Bound for Mean	10.0111
		Upper Bound	13.1889
		5% Trimmed Mean	11.5556
		Median	11.5000
		Variance	4.933
		Std. Deviation	2.22111
		Minimum	9.00
		Maximum	15.00
		Range	6.00
	Females	Interquartile Range	3.75
		Skewness	.481 .687
		Kurtosis	-.969 1.334
		Mean	1.5000 .22361
		95% Confidence Interval Lower Bound for Mean	.9942
		Upper Bound	2.0058
		5% Trimmed Mean	1.4444
		Median	1.0000
		Variance	.500
		Std. Deviation	.70711
		Minimum	1.00
		Maximum	3.00
		Range	2.00
		Interquartile Range	1.00
		Skewness	1.179 .687
		Kurtosis	.571 1.334

Source: Author's Field Survey/SPSS, 2022

Table 6: T-test on Independent Samples Test on methods of combating flooding in Minna City

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Methods of combating flooding in Minna City.	Equal variances assumed	10.047	.005	13.702	18	.000	10.10000	.73711	8.55139	11.64861
	Equal variances not assumed			13.702	10.806	.000	10.10000	.73711	8.47406	11.72594

Source: Author's Field Survey/SPSS, 2022

Decision Rule: Reject H_0 if $\alpha=0.05$ is greater than the p-value = 0.000.

Since $\alpha=0.05$ is greater than the p-value = 0.000, There is a significant difference between male and female respondents on the methods of combating flooding in Minna City; therefore, the null hypothesis is rejected.

Conclusion

In conclusion, the outcome of the findings of the study showed that flood occurrence is a notable issue in Minna City and the methods of combating flooding in Minna City requires proactive approach. There is the need for application of both structural and non-structural method in combating flooding in the study area. From the findings of the study it is evidently clear that when flood occurs in Minna City a lot of losses are recorded. Therefore, actions to regulate flood disaster in Minna City must be pragmatic to mitigate flood events in Minna.

Recommendation

Based on the results of the findings, the following recommendations were made:

1. The relevant authorities must keep to the task of being aware about what is happening, where and how on a continuous basis. The state administration managing the impact of flood disaster should be able to coordinate and regulate the works of various NGOs as many of such agencies coming with relief from farther areas hardly ever have a good knowledge of the geography as well as socio-economic environment for the identified affected areas in the study.
2. The proactive disaster management and mitigation approach should be enhanced and strictly adhered to as systematic approach of mitigation and preparedness

essentially stem from such sets of knowledge, much of which need to be appropriately collated and subsequently integrated into any disaster mitigation approach or a related management exercise. Having detailed sets of data and information on phenomenon that lead to disasters is paramount.

3. Stakeholders must identify group of suburbs, towns and villages residing in close proximities to flood prone areas whither it is located by the river banks or flood plains. By putting all these variables into cognizance would help the preventive mechanism of early detection of danger zone or flood prone areas. Settlements along flood plains can be classified or mapped out by regrouping, relocating or resettling and clustering system to put the safety and preventive approach first before any other thing is actualized.
4. The common understanding of flooding during the rainy season, which is from April to September in the study area, the post flood prediction outcome tentatively pointed to a worsening situation as reoccurring flood phenomenon remains high. This, in turn, means that there is a higher rate of downpour on the days that there is rain, which indirectly correlates with an augmentation of rain storms in Minna City and increasing threat of flooding. Therefore, communities should be informed to evacuate from identified flood-prone areas that may be caused by high water levels to prevent loss of lives and property and prioritizing the immediate relocation of communities to higher plains in order to avoid the catastrophic floods of previous years and projected future occurrences.

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