

PREDICTORS OF PSYCHOLOGICAL DISTRESS AND ENROLLMENT FIGURE AMONG SECONDARY SCHOOL STUDENTS: EVIDENCES FROM FLOOD- AFFECTED COMMUNITIES IN BORNO STATE, NIGERIA

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Abstract

The research investigated how flood disaster in Borno state have become significant barriers to educational stability leading to a sharp decline in student enrollment, and the prevalence of emotional instability among many students. The study employed a descriptive survey research design. The target population consists of all secondary school students in the flood-affected local government areas (LGAs) of Borno state primarily, Maiduguri metropolitan council and Jere. The primary tool for data collection was a researcher-developed instrument titled: "Flood Impact on Student Wellbeing and Enrolment Questionnaire" (FISWEQ). In order to ascertain the validity and reliability the FISWEQ was subjected to Face and Content Validity by experts in education and disaster management at the University of Maiduguri to ensure the items accurately measure the research variables. A correlation coefficient of 0.86 was realized. By analyzing local data and school records, it was found that flood disaster significantly affected the numerous students attending schools in Borno, and the displacement of large number of families lead to the prevalence of psychological distress characterize with insomnia, anxiety, concentration problem, frustration and aggression among the students. The study concludes by emphasizing the need for robust educational policies that incorporate disaster risk management to safeguard students' enrollment and provide psychological support systems for affected students.

Keywords: Flood Disaster, Psychological Distress, Enrollment Figure.

Introduction

Flood disasters are among the most frequent and devastating natural hazards and calamity in Nigeria, driven by heavy seasonal rainfall, poor urban planning, and river overflows (Umar & Gray, 2022; Cirella & Iyalomhe, 2018). Others scholars attributed the cause of flood in Nigeria due to weak enforcement of environmental and spatial planning laws, growing populations routinely construct residential and commercial buildings directly on low-lying floodplains, valleys, and natural drainage pathways (Elum & Lawal, 2022). Recent studies in Nigeria reveal that Northern Nigeria experiences a higher frequency of major flooding events than the south and other geopolitical zone of the nation (Umar & Gray, 2022). This development made it possible for the stability of the school environment to be gradually threatened and hindered by climate-related hazards particularly flood disaster due to extreme fluvial (river) flooding, often exacerbated by water releases from cross-border dams like Cameroon's Lagdo Dam (Umar & Gray, 2022).

Within Borno state, flooding has evolved into a chronic and destructive environmental hazard, severely impacting both urban and rural communities. A critical manifestation of this vulnerability occurred during the 2024 Maiduguri flood disaster; the structural failure of the Alau Dam precipitated catastrophic inundation, submerging approximately 70% of the state capital (Oxford Analytica, 2024). This event resulted in over 230 fatalities and the immediate displacement of more than 600,000 residents, thereby engendering a profound humanitarian crisis within a region already burdened by deep-seated structural and socioeconomic vulnerabilities (Aborode, 2025; Yunus et al, 2026). For secondary school students operating under these precarious conditions, such disasters transcend temporary localized interruptions; instead, they inflict widespread infrastructural destruction and impose protracted systemic barriers that fundamentally destabilize both educational continuity and developmental trajectories.

Furthermore, flood disasters pose a profound threat to students' physiological, emotional, and psychological well-being. Post-flood environments frequently act as primary catalysts for infectious disease outbreaks, primarily because inundation severely disrupts water, sanitation, and hygiene (WASH) infrastructure while generating stagnant water bodies that serve as optimal breeding habitats for disease vectors (Komolafe, et al 2021; Rupa & Hossian, 2024). Consequently, the resulting physical debilitation among the student population culminates in prolonged institutional absenteeism. It is well-documented that these residual stagnant pools facilitate the rapid proliferation and transmission of pathogenic microorganisms including bacteria, viruses, fungi, and protozoa which disseminate through direct contact, aerosolization, and contaminated fomites. Empirical evidence underscores this vulnerability, indicating that exposure to heightened waterborne disease vectors corresponds with a major increase in the prevalence of gastrointestinal illnesses; specifically, diarrheal incidents rise by approximately 10.6% during these environmental crises (Berggreen & Mattisson, 2023; Castro, 2017; Okaka & Odhiambo, 2018; Onwe et al., 2021).

Similarly, student well-being is recognized as a complex, multidimensional construct and is determined by an environment well protected from distressing psychological conditions that impede cognitive acquisition and it also encompasses the manifestation of positive affect, systemic engagement, and the optimization of individual student potential (Bautista et al., 2023; Jarden & Roache, 2023). Within the academic setting, student wellbeing is increasingly viewed through the lens of positive education, which assimilates traditional academic instruction with the cultivation of psychological and social resources (Gomez-Baya & Gillham, 2019; Seligman et al., 2009). On the other hand wellbeing is copiously achieve when three basic psychological needs are fulfill: autonomy (feeling in control), competence (feeling capable), and relatedness (feeling connected to others) (Deci & Ryan, 2000). When educational settings fulfill these needs, students show higher intrinsic motivation and better emotional adjustment.

In the contemporary era, national development is intrinsically linked to school enrollment rates, which directly determine the cultivation of essential human capital needed for society to develop. This includes educators, academics, entrepreneurs, business leaders, healthcare professionals, agronomists, and civil society actors, as well as journalists, artists, and cultural custodians. Collectively, these cohorts fortify a nation's social, economic, scientific, cultural, and political infrastructure. Consequently, school enrollment serves as a highly reliable, consistent, and accurate metric for assessing community development and systemic stability. Aligning with this perspective, Hassan and Mahmoud (2021) posit that community stability and development are fundamentally contingent upon the functionality of the educational system, positioning school enrollment as a primary indicator of institutional and social service stability.

Conversely, disruptions in school enrollment and attendance frequently mirror broader systemic instability, given that educational institutions alongside healthcare facilities are recognized as the foundational pillars of community resilience (Hassan & Mahmoud, 2021). Empirical research demonstrates that environmental crises, such as flooding, act as severe socioeconomic shocks that compel households to prioritize immediate survival over formal education (Ado et al., 2024; UNESCO, 2024). Consequently, declines in student enrollment following flood disasters represent a well-documented phenomenon driven by a compounding matrix of infrastructural destruction, acute economic hardship, and protracted displacement.

Furthermore, despite the increasing frequency of flood disasters in Nigeria, the prevailing literature remains predominantly focused on macroeconomic shocks, widespread infrastructural damage, and agricultural asset loss, thereby overlooking the intricate ripple effects exerted on the educational sector specifically regarding student well-being and enrollment metrics. Consequently, a notable dearth of empirical evidence persists concerning the direct causal linkages between environmental disasters, quantifiable fluctuations in secondary school enrollment, and the qualitative decline in student psychological well-being. This gap constitutes a critical vulnerability for educational stakeholders, emphasizing the urgent need to address the intersecting impacts of climate-induced disasters on academic persistence and emotional development. To address this omission, the present study critically explores these variables to establish an empirical roadmap for designing and implementing climate-resilient educational policies in Borno State.

Statement of the Problem

The clamorous occurrence of flood disasters in Borno state has transcended being a mere environmental issue, evolving into a significant systemic threat to the state's educational stability. Despite efforts to achieve the Sustainable Development Goal (SDG) of inclusive and equitable quality education, the recurrent inundation of communities most notably the catastrophic 2024 Maiduguri floods has created a precarious environment for secondary education.

Flooding often results in the unexpected displacement of large number of families and the destruction of homes in Borno state. This leads to prevalence of a psychological problem for secondary school students, who are at a vulnerable developmental stage. Many students suffer from trauma, anxiety, and a sense of hopelessness after witnessing the loss of family assets or being forced into overcrowded Internally Displaced Persons (IDP) camps (Perms, 2024). Furthermore, the post-flood environment poses severe physical health risks, such as cholera and malaria outbreaks, which physically incapacitate students and hinder their ability to engage in academic.

There is a disturbing trend of declining enrollment figures following major flood events. When schools are submerged or used as temporary shelters for flood victims, the academic calendar is suspended indefinitely. During these hiatuses, many students particularly those from low-income households are pressured into child labour or street hawking to help their families recover financially. For many, this temporary withdrawal becomes permanent, leading to a sharp rise in dropout rates and a significant decrease in the overall enrollment figures of secondary schools in the affected Local Government Areas.

The physical destruction of school buildings, laboratories, and instructional materials (such as textbooks and computers) by floodwaters creates a long-term barrier to learning. Even after water recedes, the lack of a conducive learning environment prevents many students from returning. There is currently a lack of empirical data and strategic planning to address how these environmental shocks specifically alter the demographic composition of schools and the mental health of the student population in Borno State.

Objectives of the Study

The primary objective of this study is to investigate the impact of flood disasters on the educational landscape of Borno State. Specifically, the study seeks to:

1. Determine the prevalence and levels of psychological distress (such as depression, anxiety, and post-traumatic stress symptoms) among secondary school students in flood-affected communities of Borno State.
2. Determine the influence of flood disasters on student enrollment figures in secondary schools within the affected local government areas.
3. Identify the gender-specific variations in school dropout rates following major flooding events in the state.

Research Questions

The following questions guide the investigation:

1. What are the prevalent levels of psychological distress among secondary school students in flood-affected communities of Borno state?
 2. To what extent have enrollment figures in secondary schools fluctuated in the years following major flood disasters in Borno state?
 3. Is there a significant difference in the enrollment patterns of male and female students after a flood-induced displacement?
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Hypotheses

The study tests the following hypotheses at a 0.05 level of significance:

1. There is no significant relationship between the frequency of flood disasters and the psychological wellbeing of secondary school students in Borno state.
2. Flooding disasters do not significantly influence the total enrollment figures of secondary schools in the flood-prone regions of Borno state.
3. There is no significant gender difference in the school re-enrollment rates of students displaced by flooding in Borno state.

Methodology

This research methodology focuses on the systematic approach for investigating how flood disasters affected the psychological wellbeing and enrollment figure of secondary school students in Borno state. The study employed a descriptive survey research design. This design is appropriate because it allows for the collection of data to describe the existing conditions, opinions, and attitudes of students regarding flood impacts without manipulating the variables. A mixed-methods approach (quantitative via questionnaires and qualitative via brief interviews) is recommended to capture both statistical trends in enrollment and the lived experiences of students' wellbeing.

The target population for this study consists of all secondary school students in the flood-affected local government areas (LGAs) of Borno state (primarily Maiduguri metropolitan council and Jere). Total Estimated sample is 398 students and the target group is students currently enrolled in or recently displaced from secondary schools in the identified high-risk zones. A stratified random sampling technique was used. The population was stratified by gender (male/female) in public secondary schools. This ensures that the final sample reflects the diverse demographics of the student body. The primary tool for data collection was a researcher-developed instrument titled: "Flood Impact on Student Wellbeing and Enrolment Questionnaire" (FISWEQ). The questionnaire was divided into three sections: Section A: Demographic information of the respondents that comprises of students age, gender, and school location, class. Section B comprises of items depicting psychological wellbeing measuring psychological distress, health issues, and living conditions). Section C comprises of enrolment and attendance register used as measuring frequency of absenteeism, school dropout risks.

In order to ascertain the validity and reliability the FISWEQ was subjected to face and content validity by experts in education and disaster management at the University of Maiduguri to ensure the items accurately measure the research variables. Also in the case of reliability a pilot test was conducted using 20 students outside the main sample. The Cronbach Alpha method was used to determine internal consistency, with a coefficient of 0.70 that is higher and considered the instrument as acceptable and reliable capable of measuring what is purported to measure.

Data collection was executed through a dual-approach methodology comprising field surveys and document analysis. The field surveys involved the direct administration of structured

questionnaires to students within formal school settings and Internally Displaced Persons (IDP) camps. Concurrently, document analysis was conducted by reviewing school attendance registers, where accessible, to facilitate a comparative analysis of pre- and post-flood enrollment metrics across the sampled institutions.

The generated quantitative dataset was processed and analyzed utilizing the Statistical Package for the Social Sciences (SPSS), version 27.0. Analytical procedures encompassed both descriptive and inferential statistics. Descriptive statistics: mean scores, and standard deviations were computed to address the primary research questions. Inferential statistics: independent samples *t*-tests were performed to evaluate the null hypotheses, specifically examining statistically significant differences in student well-being across demographic variables, such as gender (male versus female).

Results

Research Question I: What is the level of psychological distress experienced by secondary school students in Borno state following a flood disaster?

Table 1: Level of psychological distress among Borno state secondary school students following flood disaster.

S/n	statement	n	mean	std. dev.
1	I often feel anxious or worried when it starts to rain.	398	2.81	1.12
2	I find it difficult to concentrate on my studies due to the loss of my home/belongings.	398	3.10	0.99
3	My physical health has declined (e.g., malaria, waterborne illness) since the flood.	398	2.76	1.11
4	I feel a sense of hopelessness regarding my future education.	398	2.68	1.14
5	I have no regular access to clean drinking water and balanced meals.	398	2.97	1.08
6	I have trouble sleeping or waking up with bad dreams about the flood.	398	2.72	1.12
7	I find it difficult to relax or calm down when thinking about rain or water.	398	2.84	1.09
8	I feel easily irritated, angry, or upset by small things.	398	3.24	1.21
	Overall Mean		2.89	1.11

The overall grand mean of 2.89 is well above the theoretical mid-point threshold of 2.50 for a 4-point Likert scale. This indicates an overall high level of psychological distress experienced by secondary school students in Borno State following the flood disasters. Furthermore, the grand standard deviation of 1.11 indicates a consistent spread of responses around the mean, demonstrating that the student opinions are tightly clustered and statistically stable."

Research Question 2: To what extent have enrollment figures in secondary schools fluctuated in the years following major flood disasters in Borno state?

Table 2: independent samples t-test comparison of secondary school student enrollment figures

Variable	Group	N	M	SD	t	df	p
School enrolment	Non flood Prone Schools	5	565,485.00	10,691.70	6.397	4	000.3
	Flood Prone Schools	5	374,572.33	50,570.30			

An independent samples t-test was conducted to determine if there was a statistically significant difference in students' enrollment figures between non flood prone schools in Borno state and flood prone schools. The descriptive results indicated that non flood prone schools had a higher mean enrollment score ($m = 565,485.00$, $sd = 10,691.70$) compared to flood prone schools ($M = 374,572.33$, $SD = 50,570.30$). The inferential analysis revealed a statistically significant difference between the two groups, $t(4) = 6.397$, $p = .003$. Since the p-value is less than the chosen alpha level of .05, the null hypothesis is rejected. This confirms that the enrollment figures across these two categories vary significantly, with non-flood prone schools in Borno State maintaining a substantially higher volume of student retention and turnout."

Research Question 3: Is there a significant difference in the enrollment patterns of male and female students after a flood-induced displacement?

Table 3: independent samples t-test comparing student enrollment patterns after flood displacement by gender

Variable	Group	N	M	SD	t	df	p
School enrolment	Non flood Prone Schools	10	611,404.71	132,950.13	3.881	12	.002
	Flood Prone Schools	10	377,050.14	88,633.93			

From the above table as can be seen an independent samples t-test was executed to determine whether a statistically significant gender difference exists in the secondary school enrollment figures in Borno state across a seven-year timeline (2020–2026). The descriptive data revealed that the mean enrollment for male students ($M = 611,404.71$, $SD = 132,950.13$) was notably higher than the mean enrollment for female students ($M = 377,050.14$, $SD = 88,633.93$).

The inferential results confirmed that this gender gap is statistically significant, $t(12) = 3.881$, $p = .002$. Since the p-value is below the conventional threshold of .05, the null hypothesis is rejected. This statistical outcome demonstrates a clear inequality in access to or retention in education, showing that significantly more male secondary school students are enrolled in Borno State compared to their female counterparts across the studied timeframe.

Discussion of Findings

The first research question tried to explore the prevalent levels of psychological distress among secondary school students in flood-affected areas within Borno state. The descriptive analysis revealed that a significant majority of the respondents exhibited significant level of psychological distress with a grand mean score of 2.89 which above the theoretical mid-point threshold of 2.50 levels of psychological distress. This distressing condition was characterized with feeling of excessive worries, difficulty concentration (nervousness), declining in physical health, hopelessness, lack of sanitary water, insomnia, difficult to relax and irritation.

This finding indicates that flood disasters trigger profound internal psychological crises within the adolescent student exposed to flood disaster. The high prevalence of distress captured in this study can be conceptually explained through the lens of acute disaster trauma framework. When floodwaters breach communities, adolescents experience immediate, life-threatening stressors such as witnessing the destruction of their homes, the loss of family assets, and the sudden disruption of their safe academic routines, community members being injured, swept away, or killed, being trapped on rooftops or upper floors without access to drinking water, food, or communication for extended period.

The empirical findings of this study strongly align with recent regional literature connotes that flooding triggers substantial and anomalous levels of psychological distress that manifest as severe anxiety, depression, and post-traumatic stress disorder (PTSD). Crucially, researches indicates that a staggering 63.6% of children affected by floods in Maiduguri, Borno State exhibit abnormal levels of psychological distress, heavily compounded by preexisting trauma from ongoing conflicts, displacement, and economic hardship (Haruna et al., 2025). Furthermore, related regional studies on climate-driven flood displacement emphasize that more than 63.3% of victims suffer from moderate-to-severe depressive symptoms and 53.4% experience clinically elevated anxiety (Dagona & Alkali, 2024). These disruptions undermine long-term mental development, fracture family structures, and induce high reliance on maladaptive coping mechanisms due to a widespread lack of adaptive psychological resources (Haruna et al., 2025; Oluka et al., 2023). Furthermore, the high indices of anxiety and hopelessness found in this cohort mirror the global climate anxiety trends highlighted by Hickman et al. (2021), who noted that a vast majority of youth in developing nations like Nigeria experience severe ecological grief and helplessness when confronted with escalating environmental shocks.

The second research question focused on exploring fluctuation and dropping down of students' rate of enrolment figure following flood disaster in Borno state, Nigeria. The true picture of Borno's economy relies heavily on subsistence and commercial farming. Floods wash away topsoil, ruin standing crops, and drown livestock. Therefore, the nature of secondary education in Nigeria often requires out-of-pocket expenses (such as registration fees, uniforms, and PTA levies), the sudden collapse of household income forces parents to prioritize basic survival over schooling (Mudavanhu, 2014; Oyekan et al., 2023). With this development to help households

recover financially, adolescent boys are frequently pulled from secondary schools to engage in artisanal labour, agricultural clearing, or street hawking. Once an adolescent enters the workforce for more than a single school term, the probability of re-enrollment drops significantly. Findings indicate that secondary school enrollment does not simply experience a minor downward trend following a flood disaster; instead, it undergoes a severe, immediate systemic reduction. This aligns with the findings of (Wang, 2024; Pal et al., 2023; Zang et al; 2024; Pal, et al) key findings demonstrate that When severe flood disasters strike, the immediate destruction often triggers a substantial downward trend in student enrollment figures.

The third hypothesis is on gendered dropout tracks as immediate floodwaters recede, the trajectory of enrollment numbers does not show a linear recovery. Rather, secondary school enrollment experiences prolonged stagnation or a secondary drop-out curve driven by acute household economic shocks. Because secondary education in Northeast Nigeria frequently requires out-of-pocket spending (e.g. registration fees, uniforms, and learning materials), the absolute destruction of family livelihoods makes re-enrollment a financial impossibility. The literature strongly establishes that there is a statistically and socially significant difference in the post-flood enrollment patterns of male and female secondary students. This situation was compounded by sanitation and security barriers place more on girls than boys. The physical realities of displacement camps and damaged secondary schools place unique structural pressures on girls. Flooding routinely decimates local water and sewage networks (Jan, 2026). The resulting lack of safe, gender-segregated toilets and an absence of menstrual hygiene support expose adolescent girls to acute health issues and high risks of gender-based violence (GBV) (Kahomwe, 2025; Karam, 2026). Consequently, parents actively withhold displaced daughters from returning to school due to protective security concerns, flatlining female re-enrollment rates. Even if a displaced girl remains technically "enrolled," her chronic absenteeism due to domestic care and water-collection duties inevitably leads to poor academic performance and gradual structural drop-out (Joint Data Center on Internal Displacement, 2024).

Conclusion

This study establishes a profound, quantifiable link between environmental shock, acute psychological vulnerability, and the systemic contraction of secondary school access within flood-affected communities in Borno State. The empirical evidence demonstrates that flooding acts as a severe threat-multiplier in this region. For adolescents already navigating the baseline anxieties of a protracted post-conflict setting, the physical devastation of a natural disaster dramatically accelerates psychological distress, characterized by anxiety, trauma-induced depression, and emotional withdrawal. Parallel to this psychological toll is a stark crisis in academic enrollment figures. The study confirms that post-flood enrollment contraction is not merely a product of temporary relocation, but a structural dropout emergency driven by direct and indirect pathways.

Recommendations

Based on the empirical evidence presented in this study, the following recommendations are put forward:

1. The Borno state ministry of education, in collaboration with non-governmental organizations (NGOs), must fully train secondary school teachers and guidance counselors various strategies and techniques to identify students with symptoms of psychological distress and replace maladaptive avoidance behaviors with structured adaptive coping mechanisms. Also, in line with this, there is the need to set up peer-led "Psychological First Aid" clubs with the hope of cultivating emotional resilience and combat climate-related anxieties.
2. The government should implement targeted enrollment subsidies and gender-specific protections, emergency cash transfers and school-fee waivers specifically earmarked for flood-affected households. Because female students face a higher statistical probability of permanent dropout, conditional cash transfers must prioritize keeping girls enrolled, thereby mitigating the risk of families utilizing early marriage or domestic labour as economic coping strategies.
3. The state ministry of environment and the state secondary school management board should administer geospatial risk mapping to ensure future school infrastructure is built away from floodplains or structurally elevated. Existing facilities must be retrofitted with elevated classrooms, flood-resistant drainage, and secure, climate-adapted water, sanitation, and hygiene (WASH) blocks to prevent prolonged, trauma-inducing school closures.

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