

Economic Vulnerability, Climate Change, and its Influence on School Enrolment: A Study of Dambatta Rural Community

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ABSTRACT

Objective: The present study focused on exploring the influence of parents' economic vulnerability in the agricultural sector on students' enrollment in the Dambatta Local Government Area of Kano State, a rural community in Nigeria. **Method:** The quantitative and qualitative methods (mixed mode) were employed throughout this study. Two separate questionnaires were administered to 108 teachers and 28 parents who were randomly selected for interview. **Results:** indicates a moderate negative relationship between vulnerability in economic and students' school enrolment in the rural community, with $r = -0.686$, $p = 0.000$, $P < 0.01$. That means an increase in vulnerability in agricultural jobs leads to a decrease in students' enrolment. However, it was discovered that most parents in the rural community hold negative views regarding their children's education during economic vulnerability. **Novelty:** The study signified that economic vulnerability caused by climate change, like negative precipitation and agricultural productivity, directly influences school conditions and educational decisions in rural communities.

INTRODUCTION

Parents' economic vulnerability caused by climate change affects agricultural production, leading to social instability and a struggling economy. For most people living in rural communities of Kano State, Nigeria, where many have school-age children, it can disrupt the learning process at school. Especially in Dambatta, there is strong evidence that climate change is happening locally in Nigeria, directly observed through fluctuations in climate variables such as temperature, rainfall, wind, humidity, evaporation, and cloud cover (Pulungan et al., 2024). Agriculture, a key part of rural economies, faces serious consequences from changes in climate conditions. Recent empirical analyses confirm that climate shocks, including extreme rainfall and drought, significantly reduce agricultural income and amplify household food insecurity in rural areas, limiting families' capacity to invest in non-farm expenditures such as education. Studies using quantile regression frameworks in Bangladesh and wider developing contexts demonstrate that households with lower adaptive capacity are especially vulnerable to such income losses, exposing them to compounded welfare risks (Ahmed, 2024; Hallegatte et al., 2016; Terefe et al., 2024).

The sector's vulnerability to climate variations exposes it to significant risks and negative impacts (Mitrică et al., 2025; Tilumanywa, 2021). Recent empirical studies indicate that climate-induced shocks – particularly rainfall variability and extreme heat – directly undermine agricultural productivity and household income stability in agrarian economies. Evidence from developing countries shows that such shocks reduce crop

yields, increase livelihood insecurity, and intensify household vulnerability, especially among smallholder farmers with limited adaptive capacity (Aragón et al., 2021; Baez et al., 2017; Baffour-Ata et al., 2024). These dynamics establish a structural pathway through which climate change translates into broader socio-economic stress at the household level.

Moreover, in Kano State, climate variability and change worsen agricultural output. The production of millet, early maturing varieties of sorghum and maize, as well as rice and wheat – crops that farmers have adopted to cope with the harsh climate – has greatly declined. In addition, increasing variability in rainfall further harms agriculture and food production (Alberti et al., 2022; Ochieng et al., 2016). This heavily impacts the local economy, where 90% of activities are climate-dependent (Kurukulasuriya et al., 2022). While the economic vulnerability to climate variability is notably marked in sub-Saharan Africa, where more than 60% of the people engage in agriculture, and 96% of cropland relies on rain-fed systems, this affects the living conditions (Canton, 2021).

Beyond immediate income effects, climate-related environmental risks generate broader structural pressures that shape household decision-making. Recurrent exposure to climate stressors intensifies economic uncertainty and encourages short-term survival strategies, including the postponement of long-term investments such as education. Conceptual and empirical analyses emphasize that environmental risk can undermine household resilience, leading families to reallocate resources toward immediate consumption and labour needs at the expense of children's schooling, particularly in rural and climate-sensitive regions (Vassiloudis, 2026).

Climate change disrupts global weather patterns, leading to temperature variations and unpredictable precipitation cycles (Pizzorni et al., 2024; Savo et al., 2016). Climate change exacerbates economic instability in rural communities by affecting agricultural productivity, which is a primary livelihood source. This instability often leads to increased poverty and reduced financial resources for families (Allen et al., 2025; Gutierrez et al., 2020; Waqas et al., 2025). Research on educational access in sub-Saharan Africa demonstrates that economic instability at the household level is a major determinant of school non-enrolment and absenteeism. In rural contexts, poverty-related constraints frequently outweigh parental aspirations for education, resulting in delayed enrolment, irregular attendance, or withdrawal from school altogether (Bano, 2020; Roby et al., 2016; Shi & Sercombe, 2020). These findings suggest that educational participation is highly sensitive to short-term economic stressors.

Climate change serves as an impediment to development in rural areas of low- and middle-income nations across the globe (Dube, 2023). Undoubtedly, the impacts of variations in rainfall, floods and temperature on agricultural output are more pronounced in this region than in other developing areas (Manucharyan, 2025; Saleem & Smirnova, 2026). It is predicted that by 2050, many areas in Nigeria and other African countries will experience novel climates for at least half of the current crop year (Masson-Delmotte et al., 2021). Higher temperatures, prolonged droughts, and more frequent and severe storms are expected to worsen the challenges faced by Nigeria's agricultural production system (Ranasinghe et al., 2021). Therefore, the delayed onset and early cessation of rainfall have a significant impact on agriculture (Minoli et al., 2022).

The alterations in the environment have adverse effects on agricultural productivity, subsequently hindering households from investing in human capital and enhancing their living conditions. Research conducted in Ethiopia found that the extensive margin of one unit increases in agricultural shock significantly reduces the likelihood of joining farm labor and family business. At the intensive margin, a one unit increase in agricultural shock significantly reduces school and study time by 0.27 hours and increases farm labor and business activity by 0.65 hours (Sedai et al., 2022). Recent interdisciplinary research emphasizes that climate change affects educational continuity not only through economic pressures but also through direct disruptions to schooling infrastructure and attendance, as children in low-income contexts are disproportionately impacted by extreme weather events that disrupt learning environments (Fitzpatrick et al., 2024; Kraft et al., 2025).

Investing in human capital is concerned with activities that influence future real income through the embedding of resources in people, including schooling and on-the-job training (Becker, 1962). Since higher-income people had more physical capital than others, this ties in closely with the new emphasis on intangible resources and may be useful in attempts to understand the inequality in income among people. Abler persons receive more education than others. If education were economically important, the monetary rates of return on education ought to be significant (Becker, 1962; Kessler & Lülfesmann, 2002). Recent reviews of human capital theory emphasize that while returns to education remain substantial, liquidity constraints and income volatility significantly limit households' ability to sustain educational investments under conditions of economic uncertainty (Flabbi & Gatti, 2018; Psacharopoulos & Patrinos, 2018).

The present study is unique among the above-mentioned studies. Firstly, no single study has been conducted to determine the climatic effects on educational enrollment in the Dambatta rural community of Kano State. The first study investigated the impact of agricultural productivity decline on education investments, and the second one investigated child labour and household investment in child education and health. The present study explores the direct relationship between economic vulnerability in the agricultural sector caused by climate change and students' school enrolment. Secondly, this study provides novel empirical data on Dambatta, Local Government Area of the North Kano State, a rural community in Nigeria. It will contribute to the body of literature exploring climate vulnerability and its spillover effects on education, especially in under-researched regions like northern Nigeria. Ngamdu et al. (2022) document climate-related challenges to food crop production in Dambatta Local Government Area, confirming that agricultural decline is already affecting livelihoods in the study area. This local evidence strengthens the empirical grounding of the present study's focus.

The hypothesis was formulated based on various studies that have explored the negative effects of socio-economic status and other variables, including students' learning motivation, self-regulation, self-esteem, and academic performance, among others. The findings of this study will give adequate information regarding the adjustment to reduce the economic vulnerability of climatic variability, which negatively affects the lives of people in Dambatta rural community. The study will also provide a clearer picture of how child labor distracts rural children's educational enrolment. This

description can be used as material for reflection on teachers, parents, and policy makers through provisions of some adjustments and mitigations to rural people. Finally, the study will also add value to the body of existing knowledge in the field of education regarding economic factors.

RESEARCH METHOD

The design of this study is a mixed-mode approach, by collecting mixed forms of data, including quantitative survey data and qualitative open-ended interview data (Creswell & Creswell, 2018; Tashakkori & Teddlie, 2010). The mixed method arrangement for collaboration so that stronger results could be surely drawn (Indrawan & Jalilah, 2021). Quantitative design involved using numbers as well as applying a statistical tool for data analysis, while qualitative research is research that produces analysis procedures that do not use statistical analysis procedures or others (Nainggolan et al., 2024). It is quantitative as it involves the use of numbers and numerical data, as well as applying a statistical tool for data analysis. In this study, we use the Ordinary Least Squares statistical tool to examine the relationship between economic vulnerability and students' school enrolment. A technique in linear regression that aims to find the most appropriate straight line through a set of data points by minimizing the sum of the squared differences between observed values and those predicted by the model. This method is used to estimate coefficients in a regression model, which then helps understand the relationship between independent and dependent variables and make predictions. The quantitative method was used to answer the first research objective. However, it is a qualitative as inductive method of thematic analysis of qualitative research was adopted to answer the second research objective. This qualitative study aimed to understand the opinions and experiences of the respondents.

The population of this research encompassed the entire teachers and parents with children attending secondary school in rural communities. This study is limited to the rural community in Dambatta, which is primarily an agricultural area with farming being the main economic activity. The fertile land supports the cultivation of crops such as millet, maize, rice, and vegetables. Livestock rearing, especially cattle and goats, is also common in the area. Dambatta has several educational institutions, including primary and secondary schools, for the local population. It was estimated by the education secretary of Dambatta local government that there are about 150 teachers in their rural communities. Based on this population, 108 teachers and 108 parents were randomly selected as a sample for the study. They are selected simply at random to fill out different questionnaires on economic vulnerability in the agricultural sector and students' school enrolment to address the first research objective. The researcher chose a sample from a population in a situation where all members of the target population would have an equal chance of being selected. However, thirty of the parents were purposely selected for an interview to answer the second objective. According to (Bernard, 2013), there is growing support that 10-20 key research participants (interviewees) are enough to uncover and understand the major issues in any study of lived experience. Purposive sampling was used to select participants for the interview to address the second research

objective is a type of non-probability sampling that gives freedom for researchers to select the participants based on the research question asked (Mustapha, 2000).

For the quantitative part, two separate questionnaires were developed and used as data-collection instruments. These questionnaires relate to the first objective of the study, to which the respondents (teachers and parents) are required to answer in a Likert Scale. The first questionnaire was designed for parents to assess economic vulnerability, and the other one was designed for teachers to assess the students' school enrolment. For the qualitative part, twenty-eight parents out of thirty were able to be interviewed due to unreachability. An interview is the most suitable instrument used to collect qualitative data, hence it is applied here in this research. It also helps the researcher to easily streamline the flow and focus the responses from the respondents within a short period of time.

For the validity and reliability of the instruments, it was presented to the experts in the field of educational psychology and economics for face, content, and construct validity to ensure that the instruments measure what was claimed. The reliability of the instrument was determined by using a pilot study on a small number of the target population, to assess the feasibility, time, cost, adverse events, and effect size (statistical variability). The value of Cronbach's alpha is .756 based on the study. Therefore, the value exceeded the minimum value of 0.6 as recommended (Hair et al., 2010; Nunnally, 1978). In a nutshell, any irrelevant items were removed, and ambiguous questions were discarded. Regarding the data analysis, for the quantitative part, a Pearson correlation coefficient (Chee, 2015) was used to analyze the collected data of the first research objective through the Statistical Package for Social Sciences (SPSS). However, regarding the qualitative part, the second objective was answered through an inductive approach using thematic analysis. It has been employed in interpreting the qualitative data, which were logically presented in tables and further analyzed. It is a method for identifying, analyzing, and reporting patterns (themes) within data. It also organizes and describes the data set in detail.

RESULTS AND DISCUSSION

Results

Demographic data for teachers in this study comprises gender and education level, while gender was only used as a demographic characteristic for parents. Tables 1, 2, and 3 below summarize the distribution of the demographic data of one hundred and eight respondents and explain their characteristics as well.

Table 1. Distribution of Respondents' (teachers) Gender

Teachers' Gender		
	Frequency	Percentage
Male	81	75%
Female	27	25%
Total	108	100

As shown in Table 1 above, regarding gender, there are 81 (eighty-one) male teachers (respondents) representing 75% of the respondents, and 27 female teachers

representing 27% of the respondents. This indicates that most of the teachers in the rural community of Dambatta are male teachers.

Table 2. Distribution of Respondents' (teachers) Level of Education

Teachers' Level of Education		
	Frequency	Percentage
Diploma	18	16.7%
National Certificate of Education	49	45.4%
Degree	35	32.4%
Masters	6	5.6%
Total	108	100

Table 2 above revealed that the teachers' level of education was predominantly with 49 respondents, representing 45.4% who have been teaching with an N.C.E certificate, and 35 teachers, constituting 32.4% who have been teaching with a degree certificate. It also indicated that 18 teachers (16.7%) have been teaching with a diploma certificate. However, there are 6 teachers (5.6%) who have been teaching with a master's certificate. From here, it will become evident that the majority of the teachers are N.C.E. holders.

Table 3. Distribution of Respondents' (parents) Gender

Parents' Gender		
	Frequency	Percentage
Male	101	93.51%
Female	7	6.48%
Total	108	100

As shown in Table 3, regarding the gender of parents, there are one hundred and one male parents (respondents) representing (93.51%) of the respondents, and 7 female parents representing (6.48%) of the respondents. This indicates that most of the respondents (parents) are male.

Regarding the first objective, the finding was summarized in Tables 4 and 5. The first table was the descriptive statistic table of the variables, while the second table was the coefficient table. Table 4 lists the variable names in two rows. In the first row, one can see the name "economic vulnerability," an independent variable, and in the second row, the name "Students' School Enrolment," the dependent variable. However, in the 5th table, one will see a value for Pearson's r and a Sig. (2-tailed) Value and a sample (N) value. Pearson's r for the correlation between agricultural vulnerability and Students' School enrollment is -0.686, as shown in the table.

Table 4. Descriptive Statistics

	Mean	std. Deviation	N
Economic Vulnerability	39.4722	4.56000	108
Students' School Enrolment	9.4352	3.62048	108

Table 4 indicates the mean and standard deviation of the variables as well as the total number of the sample, particularly selected for the study. The mean of vulnerability

in agriculture is 39.4722, while for students' school enrolment is 9.4352, which indicates the arithmetic average of the items under each variable. However, the standard deviation measures the variability of each variable, which is 4.56000 for economic vulnerability and 3.62048 for students' school enrolment.

Table 5. Pearson Correlation for the Variables

Variables	<i>r</i>	<i>p</i>	<i>n</i>
Economic Vulnerability	-0.686	0.000	108
Students' School Enrolment	-0.686	0.000	108

** Correlation is significant at the 0.01 level (2-tailed).

From Table 5 above, one can realize "there was a moderate negative correlation between vulnerability in agriculture and students' school enrolment, $r = -0.686$, $n = 108$, $p = 0.000$. $P < 0.05$. However, $P = 0.000$, which is exceptionally low compared to 0.05, indicates a statistically significant negative correlation between the two variables. This means an increase in agricultural vulnerability, significantly associated with a decrease in students' school enrolment. In a nutshell, the results indicated a moderate negative correlation between agricultural vulnerability and students' school enrolment. Thereby, accept or reject the null hypothesis that there is no significant effect of vulnerability in agriculture on school enrolment. This finding is consistent with recent empirical evidence showing that rainfall shocks and climate-induced income instability significantly reduce school enrolment among children from agricultural households in rural Africa, where households respond to economic stress by postponing or withdrawing children from school (Barnor & Kafle, 2025; Thomas, 2019).

This pattern mirrors findings from other agrarian contexts, where climate variability has been shown to reduce educational participation by constraining household resources and increasing economic uncertainty. Climate-related income shocks reduce households' ability to smooth consumption and maintain educational investments, forcing parents to prioritize immediate subsistence needs over schooling expenditures, a mechanism widely documented in recent development economics literature (Palacios & Rojas-Velásquez, 2023). Empirical studies demonstrate that rainfall shocks and agricultural income losses significantly lower school enrolment and educational attainment, particularly among farming-dependent households (Randell & Gray, 2019; Shah & Steinberg, 2017; Zimmermann, 2020). Empirical research increasingly highlights household financial vulnerability as a critical mechanism linking climate change to welfare outcomes. Evidence from farming households shows that climate-related shocks significantly increase financial vulnerability by reducing income stability and weakening households' ability to smooth consumption. Heightened financial stress constrains households' capacity to sustain long-term investments, including education, thereby increasing the likelihood that schooling expenditures are reduced or postponed during periods of environmental stress (Antoniades, 2025; Yang et al., 2022).

During the second objective, this research employed an inductive thematic analysis to critically and systematically analyze data collected through interviews with the respondents (parents). In this case, the research question was answered through an inductive approach using thematic analysis. Therefore, the respondents' opinions/responses were classified into sub-themes to identify common or similar views

or ideas. Then the theme or the most popular opinion(s) in each unit of analysis or question was extracted. The table contains five central columns, namely: category of respondent, recommendation, discuss unit, sub-theme, and theme. In the 'category of respondents' column, two sub-categories of respondents engaged in the study, which are identified as category A (Male) and category B (Female). They are all indicated as R1, R2, R3, ..., R28. In the 'recommendation' column indicated against each respondent, his tentative recommendation or his initial response to the question, or his choice of one of two preset answers (for example, to either send a child to school or not to send him for the reason). The 'discuss unit' column contains the respondent's individual opinion(s) or explanation of the reason(s) why they chose their given answer or recommendation; therefore, all that was discussed under this column represents the original views or opinions of the respondents. The 'sub-theme' column is the researcher's extraction of the main idea from the reason(s) supplied by each respondent. This enables us to compare and filter for similar ideas to determine the most common ones within each category and across all respondents. The final column, 'theme', contains one or a few most popular idea (s) that is/are extracted from the overall general views across all the expressed opinions. These final themes will be used to answer our research question, which is why it is called a thematic analysis.

Table 6 Question of Interview: What is your choice during economic vulnerability: to either send your child to school or not to send him? And why?

Table 6: Respondents' Views (parents)

S/N	Category of respondents	Recommendation	Discuss Unit	Sub-theme
1	Category A	To send a child to school	R1: The education will help him in the future life, and will enable him to interact with different people in the globe.	Education is important in the child's future life.
2	Category B	Not to send a child to school	R2: I can't take the responsibilities of his basic needs like food and other required items.	The issue of poverty became a barrier to their education.
3	Category A	Not to send a child to school	R3: It is not necessary to acquire western education.	Education is not important to their views.
4	Category A	Not to send a child to school	R4: I prefer going to Madrasa (Traditional	Western education is not important to their views.

S/N	Category of respondents	Recommendation	Discuss Unit	Sub-theme
5	Category A	To send a child to school	Islamic School), than western schools. R5: I can only do what I can in regard to his education.	Will allow his child to be in the school based on his capability.
6	Category B	Not to send a child to school	R6: The food is better than otherwise, a hungry boy cannot do anything meaningful in his life.	The issue of poverty became a barrier to their education.
7	Category B	To send a child to school	R7: Education is very important at the early stage of children.	Education is important in the child's future life.
8	Category B	Not to send a child to school	R8: Basic necessities were not found, how knowledge can be acquired.	The issue of poverty became a barrier to their education.
9	Category A	Not to send a child to school	R9: I don't take it as necessary for my children.	Western education is not important to their views.
10	Category A	Not to send a child to school	R10: I can't take the responsibility of his education at that time.	The issue of poverty became a barrier to their education.
11	Category A	To send a child to school	R11: There is no option in acquiring the knowledge	Education is important in the child's future life.
12	Category B	To send a child to school	R12: Education is compulsory in the life of every child.	Education is important in the child's future life.
13	Category A	Not to send a child to school	R13: I like the education but I have no option, I rather ask him to help me curb the life challenges facing me.	Education is important but the issue of poverty became a barrier to their education.

S/N	Category of respondents	Recommendation	Discuss Unit	Sub-theme
14	Category B	Not to send a child to school	R14: It is not necessary; I prefer traditional Islamic school where there is no Kobo request for that.	Western education is not important to their views.
15	Category B	To send a child to school	R15: No progress in life without education	Education is important in the child's future life.
16	Category A	Not to send a child to school	R16: I don't care about western education, in addition to the situation we are of economic recession.	The issue of poverty became a barrier to their education.
17	Category A	Not to send a child to school	R17: I cannot take my child's educational responsibilities in this time.	The issue of poverty became a barrier to their education.
18	Category A	Not to send a child to school	R18: I can't afford it due to the hardship of the time.	The issue of poverty became a barrier to their education.
19	Category A	Not to send a child to school	R19: There is no chance for that,	The issue of poverty became a barrier to their education.
20	Category A	Not to send a child to school	R20: It is not necessary, Qur'anic knowledge is better than western education.	Western education is not important to their views.
21	Category A	Not to send a child to school	R21: I cannot take the responsibility of his school.	The issue of poverty became a barrier to their education.
22	Category B	Not to send a child to school	R22: No one to take care of his education.	The issue of poverty became a barrier to their education.
23	Category B	To send a child to school	R23: Education is like a salt of this life.	Education is important in the child's future life.

S/N	Category of respondents	Recommendation	Discuss Unit	Sub-theme
24	Category A	Not to send a child to school	R24: I like it but couldn't offer it to my child.	The issue of poverty became a barrier to their education.
25	Category A	Not to send a child to school	R25: The issue of education need some money to enable you takes care of your child.	The issue of poverty became a barrier to their education.
26	Category B	To send a child to school	R26: It is important in life	Education is important in the child's future life
27	Category B	To send a child to school	R27: I am educated, so I want to my child to be educated. Therefore, I don't care about the hardship, I will manage till success.	Education is important in the child's future life.
28	Category B	Not to send a child to school	R28: I rather send him to struggle for food in this time, but after the time, I will send him back to school.	The issue of poverty became a barrier to their education.

Source: field work 2024

Categories of Respondents

There are two categories of respondents, ranging from category A, which is referred to as male, and category B, which is referred to as female, and for the whole category, several respondents were denoted as respondents 1 up to 28 (R1, R2, R3... R28). The twenty-eight respondents were interviewed out of the thirty selected respondents.

Recommendation

This represents the initial view or the tentative response of each respondent. It indicates the choice of one of the two binary answers in the question (to send a child or not to send him). From the information in Table 7.3.1 above, we can see that only twenty-eight of the respondents responded to the question. They were with different reasons in their initial responses. Out of 100% of the respondents, 67.8% responded negatively that they will not send their children to school due to the hardship and poverty that overwhelmed the parents, and only 32.1% of the respondents (parents) agreed to send their children to school due to its importance in the future life of their children. Right from here, we can understand that the overwhelming majority of the respondents went against the school

during the vulnerability in agriculture in the rural community of Dambatta local government Kano State, and this implies a negative answer to our second objective. Let us now analyze their personal justifications for their respective choice of answers/recommendations.

Discuss-Unit

The 'discuss unit' column is the respondent's individual opinion(s) or explanation of the reason(s) why he/she chose his given answer or recommendation; therefore, all that was discussed under this column constitutes the original views or opinions of the respondents as collected from them without any modification by the researcher. Here, the participants have expressed a variety of views on the subject (to send or not to send the child to school) yet share some synonymous opinions across categories. Most of those who did not send their children to school during the time of hardship made that decision because of the hardship and poverty that became a barrier to their children's education. Most of those who believe in sending their children to school have decided to do so because of its importance to their children's future.

Sub-theme

The following frequency distribution table, extracted from Table 7 below for thematic analysis, will be used to filter and summarize all sub-themes and determine the most frequently occurring sub-theme, which will eventually serve as our theme for this thematic analysis in this section. The sub-themes are arranged in descending order from the one with the highest frequency to the one with the lowest, starting with those who did not view sending their children to school at that time, and then for those who did.

Table 7. Frequency Distribution Table for Thematic Analysis

S/No	Sub-Theme	Frequency	Details of reference
1	<i>Not to send the children to school:</i> Not to send children to school during vulnerability in economic due to the hardship and poverty that became a barrier to their education at that particular time.	19 (67.8%)	R2, R3, R4, R6, R8, R9, R10, R13, R14, R16, R17, R18, R19, R20, R21, R22, R24, R25, R28
2	<i>To send the children to school:</i> To send a children to school as they considered education as important in the child's future life.	9 (32.1%)	R1, R5, R7, R11, R12, R15, R23, R26, R27

Source: field work

From the arrangement and summary of our sub-themes, we can see that we were able to filter two different sub-themes from the entire analysis. We have 19 for those who do not want to send the children to school, and 9 for those who view sending the children to school as a vulnerability pattern.

Theme

From the information in the above table 7 the first sub-theme has the highest frequency of 19, meaning that 19 respondents out of twenty-eight have expressed their opinions suggesting similar content of that sub-theme, which is: "Most of the parent doesn't mind sending their children to school during vulnerability in economic due to the hardship and poverty that became a barrier to their education at that particular time". This is regarded as our theme analysis, and this became the answer to the research's second objective.

Discussion

The results generally prove a moderate negative correlation between vulnerability in agriculture and students' school enrolment. However, the result corresponds with the research work of (Randell & Gray, 2019), who emphasized that low rainfall, which leads to vulnerability in agriculture, causes lower educational attainment, with the impact being most significant among children from households where the head has at least a primary school education. Vulnerability in the economy caused by an agricultural failure income turns parents into low socioeconomic status for parents, and eventually affects their children's daily life activities. Children who live with parents having agricultural income decline always need additional resources from schools and teachers or any other external source to overcome the daunting task of breaking the cycle. When this gap cannot be filled for them, it discourages the children's enrolment in the school, as asserted by the present study.

However, this study shows that when vulnerability in agriculture increases by a certain number, the students' school enrolment will decrease by the same number. Therefore, it is imperative for the people and the agency concerned to work tirelessly to curb these challenges and eradicate the poor condition the inhabitants find themselves in during the vulnerability in the economy caused by climate change that affects the agricultural sector, to save the children's education. It is obvious that if the students' enrolment in the school is poor, it will definitely affect the learning performance of the children. The present study's findings differ partially from those of previous research (Nandi et al., 2022), which showed that adverse agricultural conditions affect investments in children and reduce their involvement in farm labour or family business. In contrast, this study reveals a moderate negative correlation between vulnerability in agriculture and students' school enrolment, signifying that agricultural conditions directly influence school conditions and educational decisions. Contextual, background, culture, and methodological differences may contribute to these varying findings, highlighting the need for context-specific understanding to inform policies supporting farm families and promoting education. Evidence from India further corroborates these dynamics, as Zimmermann (2020) shows that households respond to weather-related income shocks by temporarily or permanently withdrawing children from school. These schooling responses highlight the sensitivity of educational decisions to environmental and economic uncertainty, consistent with patterns observed in rural Kano State.

However, the research asserted that most parents keep their children to school during vulnerability in agriculture due to the hardship and poverty that became a barrier to their children's education at that particular time. This indicates that parents develop negative ideas regarding their children's schooling during vulnerability in agriculture as

a result of poor conditions, and are powerless to provide their children with necessities and learning materials. This means that the low income of the parents tends to become a barrier in almost all childhood development, including their school enrolment. Qualitative evidence from similar rural settings suggests that economic hardship alters parental perceptions of education, prioritizing immediate survival over long-term human capital formation. Poverty-induced stress has been shown to impair decision-making capacity and reinforce short-term coping strategies, including withdrawing children from school or engaging them in income-generating activities (Ingutia et al., 2020).

The literature increasingly suggests that heightened livelihood stress alters household decision-making by prioritizing short-term survival over long-term human capital investment. When income volatility intensifies and adaptive buffers are depleted, households are more likely to defer or curtail educational expenditures, particularly for children. Empirical evidence from rural contexts indicates that shocks which erode resilience – whether climatic, economic, or health-related – reduce households' ability to maintain consistent schooling trajectories. These dynamics highlight the risk that repeated exposure to shocks can generate cumulative disadvantages in educational attainment, thereby reinforcing intergenerational poverty and vulnerability (Bitzer et al., 2024; Kumar & Mohanasundari, 2025).

However, the issue of parents' poor condition was a problem in most areas. Unfortunately, schools provide the least support and help to these children who commonly need it most (Berridge et al., 2021). However, the discovery strengthens the research findings of (Rakesh et al., 2025), who discovered that low socio-economic status children are less cognitively stimulated towards education than high socio-economic status children. It also corresponds with research discovery by (Mainye et al., 2018) regarding most of the variation in educational enrollment explained by household-level factors, of which socio-economic factors are most important.

CONCLUSION

Fundamental Finding: There was a direct relationship between economic vulnerability in the agricultural sector caused by climate change and students' school enrolment. The increases in economic vulnerability do significantly relate to decreases in students' school enrolment. However, the study also discovered that most parent keep their children to school during the economic vulnerability caused by agricultural failure impacted to the hardship and poverty that became a barrier to their education. The economic vulnerability of the parents who were the most in agricultural sector caused by strong climate variability, as temperature variations and unpredictable precipitation cycles negatively affects the lives of people in Dambatta rural community. **Implication:** Based The government, stakeholders, philanthropists, and other support agencies within and outside the community should strive to boost the rural economy through irrigation system and provision of other business alternatives. However, they should make the issue of education available for them by supporting the children's learning and providing free learning material and other necessary items for the betterment of their education. This will reduce their hardship on one side, and on the other side, will encourage them to regularly enroll in the school. In addition to this, the school feeding program should be continued, especially in rural areas. This will promote the rate of school attendance

and reduce dropout rates, and also improve the students' concentration and educational performance in school. From the other side, it should be another duty of the teachers to encourage and motivate the students through establishing a good rapport with them and making the school to them like friendly learning environment. **Limitation:** Effective policy interventions should integrate climate adaptation with economic and educational support. This includes improving access to education, providing financial assistance, and developing community-based adaptation strategies. Special attention should be given to the most vulnerable groups, such as poor households and girls, to ensure they have the necessary support to continue their education despite economic and environmental challenges. Recent policy-oriented research emphasizes that education-sensitive climate adaptation strategies – such as social protection, school feeding programs, and livelihood diversification – are effective in sustaining school participation during periods of climatic and economic stress. **Future Research:** Another study should be conducted to examine the impact of the rainy season on rural teachers' school enrolment, as most of the teachers in this community are found to be very committed to farming in this season. Moreover, since we have now investigated the impact of vulnerability in agriculture on rural students' enrolment in the rural community of Dambatta, another study should be conducted to examine its impact on rural students' academic performance.

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APPENDIX A

Questionnaire for Parents on Economic Vulnerability due to Climate Change

Dear Respondent;

This is a survey research questionnaire designed to solicit information about “*The Impact of Economic Vulnerability on Students’ School Enrolment in Dambatta Rural Community.*” The information you will give should be treated strictly and confidentially for educational purposes. Please take a few minutes to complete the following survey and help us gather real information about the subject matter. Your participation in this survey is essential. The result will only be reported in summary form; no individual student will be mentioned.

SECTION A Demographic information

Please tick in one box in each of the subsequent questions. Your responses should be kept confidential.

Gender: Male Female

SECTION B Items on Economic Vulnerability due to climate change

Instruction: Please tick one option that best represents how much you AGREE or DISAGREE with each of the following statements. The response formats are: SA-(strongly agree) , A- (agree) , UD-(undecided), DA-(disagree) , SDA-(strongly disagree).

NO	ITEMS ON AGRICULTURAL VULNERABILITY	A	SA	UD	DA	SDA
1.	The negative precipitation of climate change causes the economic vulnerability in this community.					
2.	The economic vulnerability became one of the very hard time in this community.					
3.	The economic vulnerability often shocks the residents of this community.					
4.	There is a decline in agricultural productivity in this community during negative precipitation pattern.					
5.	The economic vulnerability pattern cripples the life’s stability of the people in this community.					
6.	The people of this community find it difficult in this time to sustain their daily life activities.					
7.	Opportunities and other jobs alternatives are minimal in this time.					
8.	Most of the villagers are in highly need of help in this time.					
9.	Friends and relatives in this time don’t offer help without hesitation.					

APPENDIX B

Questionnaire For Teachers on The Children’s School Enrolment

Dear Respondent,

This is a survey research questionnaire designed to solicit information about “*The Impact of Economic Vulnerability on Students’ School Enrolment in Dambatta Rural Community.*” The information you will give should be strictly confidential and treated for educational purposes. Please take a few minutes to complete the following survey and help us gather real information about the subject matter. Your participation in this survey is essential. The result will only be reported in summary form; no individual student will be mentioned.

SECTION A Demographic information

Please tick in one box in each of the subsequent questions. Your responses should be kept confidential.

Gender: Male Female
 Education: Diploma N.C.E Degree Masters Others

SECTION B Items on Children’s School Enrolment

Instruction: Please tick one option that best represents how much you AGREE or DISAGREE with each of the following statements. The response formats are: SA-(strongly agree) , A- (agree) , UD-(undecided), DA-(disagree) , SDA-(strongly disagree).

	ITEMS ON SCHOOL ENROLLMENT	SA	A	UD	DA	SDA
1.	The students find it difficult to manage their life in the school in this time (agricultural decline due to negative precipitation of climate change).					
2.	The students lose educational interest in the school in this time due to instability of life.					
3.	Their parent doesn’t care about their study in this time due to hardship of life.					
4.	The students in this time prefer to struggle for their basic needs than going to school.					
5.	They are not regularly attending the school in this time.					
6.	They don’t mind to engage in any school activities in this time.					

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