THE INFLUENCE OF RAINFALL VARIABILITY ON PRIMARY SCHOOL ATTENDANCE IN MBEERE NORTH CONSTITUENCY

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Abstract

Climate change persists as a significant hurdle to sustainable development. In Mbeere North Constituency, Embu County – Kenya, unpredictable weather patterns and prolonged droughts have disrupted economic livelihoods and social structures contributing to increased absenteeism among primary school pupils. Grounded on the Sustainable Livelihood Framework this study adopted a convergent parallel design which integrated quantitative and qualitative data. This study examined the influence of rainfall variability on primary school attendance in Mbeere North Constituency - with the goal of identifying how this climate specific element hampers pupils' consistence participation in education. The sample population were- 48 teachers whom questionnaires were administered to, 8 headteachers, 2 chiefs,1 National Drought Management Authority officer and 1 Sub County Education Officer who were the study's key informants' and 8 FGDs which were conducted across 8 primary schools each FGD having 6 participants. Based on the study objective – To examine the influence of rainfall variability on primary school attendance in Mbeere North Constituency, Quantitative data, gathered via questionnaires was analyzed using SPSS version 24, employing descriptive statistics while Qualitative data collected through interviews and FGDS were analyzed thematically. Correlation model was employed to determine the influence of rainfall variability on primary school attendance. The findings revealed a positive and statistically significant relationship between rainfall variability and primary school attendance (r=0.621, p= 0.035<0.05). Signifying that rainfall variability which leads to increased drought periods, food shortage and water scarcity affect negatively the attendance rates for pupils in Mbeere North Primary School. From the findings this study recommends that the government and relevant stakeholders promote Community-Based Resilience Initiatives, weather-resilient infrastructure and water provision systems embedding this into the education policy to cushion primary schools against the adverse effects of climate change. By providing localized firsthand empirical evidence this study underscored how rainfall variability as a result of climate change affects negatively primary school attendance of pupils in Mbeere North Constituency ultimately having a negative impact on the pupils' educational outcomes. This research seeks to enrich the broader discourse on climate emergencies along with education, highlighting the urgent need for adaptive strategies to ensure that children in vulnerable communities can access quality education despite the challenges posed by a changing climate.

Key Words: *Climate Change, Rainfall Variability, Educational Outcomes, Primary School Attendance*

Introduction

Every year, around 40 million children's education is disrupted by climate-induced mishaps, and this number keeps rising (UNICEF,2023). Over the world floods and droughts are among the extreme weather occurrences that are becoming more frequent and intense due to climate change - causing more and more disruptions to education, which leads to learning losses, exacerbates dropout rates, absenteeism and overall school participation of learners, which has a long-term effect on the socio-economic structure of a community, affecting development in a negative way. Through Article 12 of the Paris Agreement, numerous governments have recognized that education is essential to solving the climate challenge, (UNCC; 2015). But even so, it's still one of the least implemented features as education systems are unprepared to respond to climate risks, (Save the Children UK,2021).

Africa is particularly vulnerable to climatic fluctuation because of its high rates of poverty, reliance on rain-fed agriculture, and inadequate infrastructure (Kikstra et al. 2022). Africa's food security has been impeded by climate change, which in turn affects negatively the rate at which pupils attend school (UNICEF,2023). Extreme weather occurrences sharply lower attendance even in cases where schools remain open. The Cape Town drought in South Africa highlighted how water scarcity disproportionately affects poorer schools making it difficult for them to maintain attendance levels (Booysen & Gerber, 2021).

In Kenya 99% of children had dropped out of school during September and October 2022 due to the drought crisis (Care International Kenya,2022). Antony Ngororana, the resident representative for UNDP in Kenya notes that, “For the first time, we can see a future in which our children may be worse than we are. But this can be reversed. The human forces destroying our world must be reoriented to save our world. Our success will depend upon humanity’s ability to take decisive action and prioritize policies that invest, insure and innovate.” Kenyan North Eastern counties were among the most affected, with Mandera county recording the highest number of school dropouts at 295,470 pupils aged between four and seventeen years old followed by Garissa follows with 289,410, Wajir at 266,540, and 253,640 cases in Turkana at 253,640 and 107,600 recorded in Marsabit (NDMA 2023).

Climate change is significantly impacting Kenya's education sector, particularly primary school children, through increased absenteeism and dropout rates, which in turn threatens the country's ability to achieve its Vision 2030 development goals. 2018-2022 National Climate Change Action plan, 42 counties (Embu County included) have not yet established laws that will facilitate adaptation to unfavorable weather effects and enable them integrate climate change into their development agenda. Mbeere North Constituency in Embu County is especially susceptible because of its semi-arid climate and dependence on agriculture that is fed by rain. Increased climate variability in Mbeere North has resulted in extended droughts and unpredictable rainfall patterns, which have negatively impacted local residents' means of subsistence. This has had a direct implication on primary school attendance as most of the household’s struggle to cover the costs of education or put their immediate demands for survival before their education. The physical ramifications of climate change, like crumbling infrastructure and scarce water supplies, make it

more challenging for pupils to consistently attend school. In order to guarantee that the continuous environmental disaster does not jeopardize children's education, it is imperative to comprehend the relationship between these elements.

Mbeere North, in Embu County – Kenya experiences erratic and unreliable rainfall throughout the year, with many areas receiving less than 500mm annually - Long-lasting droughts have lowered agricultural productivity, dried up seasonal rivers like the Thura, and increased seasonal variance over the last ten years to the point where Mbeere sub-County now only sees one successful season per year (GoK, 2012). Not only are these environmental changes endangering livelihoods, but they are also causing disruptions in the education system.

Increased pupils absenteeism (in Mbeere North Constituency) stemming from these frequent extreme weather events (flooding, droughts); climate-induced migration, lack of clean water, increased gender inequalities; health crises, loss of income(especially at the household level) exacerbates the problem(primary school attendance) as families struggle to prioritize education amid survival needs hindering educational attainment, mainly for primary school children as there are considered vulnerable, making it harder to achieve inclusive and equitable quality education for all. There is a lack of comprehensive research specifically addressing how climate change affects primary school attendance in the context of Mbeere North Constituency. Ogendi, G. M. (2023), research on Climate Change and its effects on Kenyan education system, primarily discusses the general repercussions of climate change on education, which include increased waterborne diseases together with reduced family income. However, Ogendi, G. M. (2023) does not delve deeply into how these factors specifically influence primary school attendance rates. Therefore, it's against this backdrop that this research explored how unique climatic conditions in Mbeere North Constituency (ASAL) affect primary school attendance.

Objectives of the Study.

1. To examine the influence of rainfall variability on primary school attendance in Mbeere North Constituency.

Research Questions.

1. How does rainfall variability affect primary school attendance in Mbeere North Constituency?

Empirical Review

This study was guided by the Social – Ecological Systems (SES) Theory.

Social-Ecological Systems (SES) Theory

Developed by Elinor Ostrom and others, SES Theory emphasizes the interconnectedness of ecological and social systems, proposing changes in one system can significantly impact the other. The SES theory recognizes that human dimension shapes and is shaped by environment, so that

social and ecological systems are interconnected and coevolving across scales, (Petrosillo et al.,2015).

Understanding the dynamic interactions between these systems is crucial for addressing complex issues like climate change. SES theory emphasizes the complex interactions between society (in this case, primary school attendance) and environmental systems (climate change). The livelihoods of communities in Mbeere North Constituency are highly reliant on climate-sensitive activities like agriculture activities that are sensitive to climate change. Climate change, which causes rainfall variability, precedence of extreme weather events disrupts primary school attendance by affecting household incomes (through agricultural losses), food security, and clean water availability. Through the SES theory it was possible to explore and investigate how adaptable these communities are to such changes and how this adaptation, or lack thereof, influences the education of children at primary school. Additionally, through this theory it was feasible to evaluate how vulnerable households in Mbeere North Constituency cope with these challenges which emancipate from Climate Change and how that affects educational outcomes.

Review of Empirical Studies

Rainfall variability affects primary school attendance.

Rainfall variability significantly impacts primary school attendance globally, with effects varying by region. Early-life rainfall is negatively correlated with educational attainment in Central America and the Caribbean, this implies that excessive or insufficient rainfall can adversely affect educational outcomes, (Heather, Randell, & Gray,2019). (Steyn & Matladi, 2023) notes that fluctuations in rainfall can lead to crop failures, reducing household income and increasing the need for children to assist with labor, thereby decreasing school attendance. Droughts and extreme rainfall can lead to food insecurity, affecting children's health and their capacity to attend school regularly (Dieppois, 2022).

Research indicates that rural communities, heavily reliant on rain-fed agriculture, face increased vulnerability due to climate variability, which directly impacts children's nutrition and, consequently, their school attendance (Mwaniki, P.I, 2014). (Mwaniki, P.I, 2014) research conducted in Mbeere South Constituency does not offer a localized approach in regards to Mbeere North Constituency, hence this research investigated how different micro-environments within Mbeere North, such as local adaptation strategies uniquely affect primary school attendance. Despite existing research on how rainfall variability negatively affects primary school attendance in Kenya, a gap exists in the literature reviewed on the specific effects of rainfall variability on attendance rates in Mbeere North Constituency.

Research Methodology

The research design used was convergent parallel design this method was deemed appropriate as - both qualitative and quantitative data were collected and analyzed simultaneously, and results compared to get a comprehensive understanding of the research problem. Convergent parallel design was appropriate for this study as it aligned with the research objectives, facilitating the exploration of the relationships between rainfall variability and primary school attendance - without manipulating variables, and providing a detailed understanding of current conditions in Mbeere North Constituency.

Sample and Sampling Technique

For Grade 7 and 8 pupils both male and females aged 9–13 years, purposive sampling technique was used as it allowed for the selection of participants who were knowledgeable on the research subject thus providing comprehensive information for the research subject. Focus group discussions to collect data from this group – Grade 7 and 8 pupils. 8 head teachers (drawn from each of the 8 sampled schools) 1 National Drought Management Authority (NDMA) official, 1 Sub-County Education Officer and 2 chiefs - totaling to 12 respondents formed the study's Key informants where in-depth interviews were administered to. Sampling technique used in selecting the Key informants was purposive sampling. This method was justifiable as the selected participant's hold expert knowledge or direct experience with the impact of climate change on education.

For the questionnaires a total of 48 respondents that is 6 teachers per sampled school (3 males, 3 female) – were engaged drawn from 8 sampled schools. Sampling technique used in identifying respondents for the questionnaire was random sampling. This ensured that every participant had an equal chance of selection ensuring representation of both genders and diverse perspectives within the sampled schools. Stratified random sampling was used when sampling primary schools. This methodology was chosen as it ensured representation from various subgroups such as schools in drought-prone areas, flood-prone areas, and areas less affected by climate change. Mbeere North Constituency has 98 public primary schools (Ministry of Education Kenya, 2024). Adhering to random sampling technique -based on geographical locations, socio economic background of the community, school vulnerability to climate impact 8 primary schools were randomly selected.

Methods and Instruments of Data Collection.

Questionnaires

Questionnaires were used to collect data from teachers in each sampled school. The questionnaires were designed to capture and address each of the research objectives. The questionnaires consisted of closed-ended questions with predetermined response options, allowing for easy data analysis and comparison

In-depth interviews

A structured interview guide was employed to methodically collect qualitative data from key informants whom included head teachers of sampled schools, Mbeere North constituency chiefs, Mbeere North sub county education officer and a representative of The National Drought and Management Authority; interviews were used by the researcher as data collection methods.

Focus group discussions

Guided by the research objectives, and thematic guides focus group discussions were conducted with grade 7 and 8 pupils containing open-ended questions covering topics such as students' experiences with school attendance and challenges posed by climate change. Focused group interviews are used to obtain information, and identify issues, terms and interpretations from a group of individuals with similar characteristics (Mugenda & Mugenda, 2019).

Reliability and Validity.

Standardized questionnaires, focus group discussion guides and interview guides were used when conducting the research. In addition to recording FGDs the researcher kept detailed field notes for writing down non-verbal responses during interactions with the respondents.

Pilot Test.

A pilot test was conducted by administering questionnaires to a selected sample of teachers in Mutus primary school, located in Mbeere South Constituency. This school was chosen to avoid bias– as this school is in a different constituency. During the pilot test 6 hard copy questionnaires were administered to the respondents – whom included 3 female teacher and 3 Male teachers and the data was analyzed using descriptive statistics techniques. Pilot test respondents indicated that rainfall variability leads to droughts/floods which affects livelihoods, causes food insecurity, destroys infrastructures such as roads, classrooms which in turn affects negatively primary school attendance of pupils in these regions. Analyzed results from the pilot test showed a corresponding relationship between Climate change and primary school attendance. However, some respondents indicated that they had some challenges in understanding some questions such as – how extreme is extreme weather. From this feedback modification of the questionnaire was done which included paraphrasing, exclusions of certain items and reorganization of the questions to make sure that they were aligned properly.

Data Analysis Procedures

Descriptive statistics generated by SPSS version 24, such as mean and standard deviation, were used to analyze the quantitative data, while correlation and regression analysis techniques were used for inferential statistical analysis. The slope coefficients were considered significant at $p \leq 0.05$. Data was be coded in order to classify responses into exact categories and condense information into flexible summaries that could be entered into software, SPSS version 21 in order to examine quantitative results. Qualitative data from interviews and FGDs was transcribed and then analyzed qualitatively using NVIVO 12 enabling the researcher identify common themes and patterns. The findings were then presented using frequency tables, together with their corresponding interpretations.

Ethical Considerations of the Study.

This study adhered to ethical guidelines and consideration at every stage of the study. Academic integrity was observed by ensuring that all data sources were well cited and acknowledged accordingly in the study. An authorization letter from the Catholic University of Eastern Africa directorate of research was acquired. Then National Commission for Science, Technology and Innovation (NACOSTI) research permit was applied and issued – this paved the way for obtaining permission from local authorities in Mbeere North Constituency whom included the area chief, assistant sub county commissioner and the sub county education officer. Before commencing the data collection process, respondents were engaged and explained to them the nature and purpose of the study. Their consent was sought guaranteeing free participation in the study. All information gathered from the respondents was kept confidential and treated with the highest degree of anonymity.

Data Analysis, Presentations and Interpretation.

This section presents the key study findings in relation to the study examine the influence of rainfall variability on primary school attendance in Mbeere North Constituency.

Questionnaire Return Rate

	No. of respondents	Percent (%)
Response	48	100.0
Total	48	100.0

Source: Research Data (2025)

For the focused group discussions, the respondents were, 48 pupils, subdivided into eight groups of 6, while the key informants were - 8 head teachers, 2 chiefs, 1 national drought and management authority officer and 1 sub county education officer whom were all interviewed.

Examine the Effect of rainfall variability on primary school attendance in Mbeere North Constituency

leveraging on quantitative data collected using questionnaires from a sampled population of teachers and qualitative data collected using Focus group discussions from a sampled population of pupils and in-depth interviews collected from a sampled population of key informants whom included, head teachers, national drought management authority officials, area chief and the sub county education officer. Findings of this study validate that rainfall variability significantly affects primary school attendance in Mbeere North Constituency, with erratic weather patterns disrupting learners' regular attendance. In the Linkert Scale, 1-strongly agree (SA), 2-agree (A), 3-neutral (N), 4-disagree (D), and 5-strongly disagree (SD) - The table below summarizes the quantitative findings;

Effects of rainfall variability on primary school attendance in Mbeere North Constituency

	SA **%**	A **%**	N **%**	D **%**	SD **%**	Mean	Std. Dev.
Unpredictable rainfall patterns have increased absenteeism among primary school pupils.	50	50	0.0	0.0	0.0	1. 50	0. 522
Heavy rains often make it difficult for children to access	33.3	58.3	8.4	0.0	0.0	1.75	0.622

schools due to poor infrastructure.							
The changes in rainfall patterns disrupt school programs such as exams and learning schedules	50	50	0.0	0.0	0.0	1. 50	0. 522
Parents prioritize farm activities over sending children to school during rainy season.	16.7	50	33.3	0.0	0.0	2.17	0.718
Pupils are more likely to drop out of school during periods of rainfall shortages	25.0	58.3	16.7	0.0	0.0	2.08	0.996
Prolonged drought periods result in higher absenteeism rates among pupils	41.7	41.7	16.7	0.0	0.0	1.92	1.084

Findings from the study indicate that rainfall variability is indeed a significant hinderance to consistent school attendance in Mbeere North Constituency. 100% of respondents strongly agreed or agreed that unpredictable rainfall has led to increased absenteeism – low standard deviation of 0. 522, harmonizes these findings indicating strong consensus among teachers and headteachers. With 58.3% respondents agreeing and 33.3 % strongly agreeing that heavy rains often make it difficult for children to access schools due to poor infrastructure. Flooding damages roads, bridges are filled to the brim, hindering access to school thus affecting the attendance rate of pupils. With one accord respondents admitted that rainfall variability negatively affects school operations like exam timetables and learning schedule. This places these public schools at a disadvantaged position compared to their private school counterparts whose learning schedule and exam timetables are not affected by varying rainfall.

This not only affects attendance but also learning outcomes. This being evident in the past 4 years where private schools in Mbeere North Constituency have performed exemplary in The Kenya Certificate of Primary Education (KCPE) compared to their public-school counterparts (Kenya National Examination Council, 2024). With a mean of 2.17 a third of the respondents were unsure if - parents prioritize farm activities over sending children to school during rainy season. This can be attributed to a possibly differing community contexts which has different ideologies. On the other hand, 66% agreed (16.7% SA, 50% A) that parents prioritize farming over education during the rainy season, reflecting the economic dependency of households on rainfed agricultural activities which at times results in children being kept at home to assist with farm work during the

rainy season. 58.3% agreed that drought periods increase dropouts, this can be attributed due to economic hardship where parents who depend on rainfed agriculture for economic survival are faced with economic challenges making it challenging for them to pay school or sustain their children in school during drought periods. Additionally, during drought season some families migrate to other areas where there's availability of food and water contributing to children missing school. Prolonged dry spells have a ripple effect on financial constraints, food and water insecurity which accelerate absenteeism in primary schools. A higher standard deviation of 1.084 on – if prolonged drought periods result in higher absenteeism rates among pupils is an indicator that socio economic impacts as a result of droughts may differ depending on the school, household or community coping capacity.

Correlation between unpredictable rainfall and pupils likely to miss school.

Item		Pupils likely miss school	Unpredictable rainfall
Pupils likely miss school	Pearson Correlation	1	.612*
	Sig. (2-tailed)		.035
	N	48	48
Unpredictable rainfall	Pearson Correlation	.612*	1
	Sig. (2-tailed)	.035	
	N	48	48

*. Correlation is significant at the 0.05 level (2-tailed).
Source: Research Data (2025)

The above Pearson correlation illustrates an empirically significant relationship between unpredictable rainfall and pupils likely missing school accelerating absenteeism amongst primary school pupils in Mbeere North Constituency. With a Correlation Coefficient of (r = .612) – an indication of a strong positive correlation between unpredictable rainfall and pupils likely missing school and a significance value (p-value) of 0.035, which is less than the conventional threshold of 0.05 illustrating that the correlation is statistically significant. The above Pearson correlation underscores that indeed rainfall variability as a result of climate change negatively affects primary school attendance in Mbeere North Constituency contributing to high rates of pupil's absenteeism which has an effect on the education performance of the pupils.

Key informant, participant 1 who has lived and worked in Mbeere North Constituency for the last 5 – 10 years depicted a worrying trend of the current rainfall patterns in Mbeere North compared to previous years, he said that –

"The last few years that I have been living and working here dry spells have been persisting".

Illustrating that Mbeere North is currently receiving little to no rainfall compared to the last years which affects the food production capacity ultimately exacerbating the food insecurity in the area which has a negative impact on the attendance rate of primary school children.

Participant 1 echoes these sentiments by saying,

"Little rain leads to droughts which affects food productivity. In turn this makes it difficult for children to attend school consistently due to hunger".

To mitigate these challenges, Participant 1 says that –

"Schools in these regions have a community support feeding program whereby parents in these schools contribute food which include maize and beans. This food is stored in the schools' stores and used to feed children enabling them not to miss schools more so during the long drought's periods. Additionally, he said that the government in collaboration with other stakeholders is in the process of reviving school feeding programs. The biggest challenge to this community support feeding program is on its sustainability. Unless the strategize is re thought then this program might not be around for a long time."

On the other hand, findings from the focus group discussions which were conducted across sampled public primary schools revealed that indeed there has been a decrease in the amount of rain Mbeere North experiences nowadays compared to a few years ago. With all the groups admitting to the fact that rainfall variability affects their capacity in attending schools regularly-

"When it rains a lot a majority of the pupils are not able to attend school on regular basis. Because when it rains a lot floods occur, leading to seasonal rivers overflowing and due to lack of proper infrastructure such as bridges and roads the pupils who live in these areas are forced to miss school until rains subside.".

On the other hand, when there is no rain for a long-time pupil who come from extremely poor backgrounds are unable to consistently attend school. One focus group gave an example of pupils who were in class 8 last year and during the first term when the drought season was at pick these students were almost locked out of registering for the national exam. Reason being their parents are substituent farmers and given the drought shocks witnessed in the past seasons their parents had not harvested anything thus being able to afford money to pay for exam registration. It took the intervention of the school headteacher to pay for these students and ensure they register for exams. The study revealed that rainfall variability significantly affects primary school attendance in Mbeere North Constituency. Rainfall variability - both excess and scarcity - poses a major challenge to school attendance in Mbeere North, compounded by weak infrastructure, household economic vulnerability, and limited institutional support systems.

Findings and Discussions of the Study in relation to previous Studies

To examine the effect of rainfall variability on primary school attendance in Mbeere North Constituency.

There were similarities in the study findings of this objective with those of the empirical review section such as – rainfall variability affects school attendance and educational outcomes; (Agamile & Lawson, 2021) notes that drought impacts household economies, leading to withdrawal of children from school, this relates with the study findings which concluded that, prolonged droughts exacerbate absenteeism amongst primary school pupils due to food and water insecurity and the inability of their parents/ guardians to pay school fees. There were contrasts as well which included - Literature reviewed was more qualitative but for this research the researcher used a 5-point Likert scale (for quantitative aspect) providing quantifiable evidence on the study variable. Literature reviewed for this objective in chapter 2 lacked children's/ pupils real life experiences. By conducting FGDs the researcher was able to put in place pupils' perspectives, enhancing human-centered understanding of the issue. Gaps in the reviewed literature which included - lack of localized adaptation strategies, lack of empirical evidence, lack of a directed study in the Kenyan primary school context on matters climate change and limited engagement with learners first hand, were all filled through this research. Research findings from this study align strongly with and validate the reviewed literature offering localized and empirical context on how rainfall variability affects primary school attendance in Mbeere North Constituency.

Findings from this objective confirm that indeed rainfall variability significantly affects primary school attendance in Mbeere North Constituency. With all groups of the study participants concluding that rainfall variability (deficit and excess rainfall) as a result of climate change directly threatens regular school attendance and learning outcomes for primary school children in Mbeere North Constituency, particularly among vulnerable households in Mbeere North Constituency. This is supported by the fact that - 100% of respondents agreed or strongly agreed that unpredictable rainfall has increased absenteeism among pupils. 91.6% of the respondents agreeing that flooding and damaged roads prevent children from attending schools due to poor infrastructure. Prolonged droughts and rainfall shortages were linked to increased absenteeism and dropout rates. This was attributed to food insecurity, economic hardship and migration.

Conclusions

This study sought to investigate how climate-related factors influence primary school attendance in Mbeere North Constituency. The findings reveal a multidimensional relationship between climate change and education outcomes in particular primary school attendance in Mbeere North Constituency. Rainfall variability was found to significantly disrupt school attendance leading to increased absenteeism. Mainly this is because of prolonged droughts and episodes of heavy rainfall which lead to increased household vulnerability and food insecurity. Which in turn intensity the situation – that is absenteeism. Food insecurity as a result of climate-induced droughts emerged as a critical obstacle to consistent school attendance, mostly forcing pupils, especially pupils from economically challenged households, to engage in casual labor to supplement family incomes, thereby undermining their school attendance, performance and other educational outcomes. By providing localized firsthand evidence this study underscores how climate change, through rainfall variability and food insecurity, affects negatively primary school attendance of pupils in Mbeere North Constituency ultimately having a negative impact on the pupils' educational outcomes.

Recommendations

As per the study objectives this study recommends the following:

1) Examine the effect of rainfall variability on primary school attendance in Mbeere North Constituency.

That there's need for the Kenyan ministry of education and the Kenya Institute of Curriculum Development to integrate climate change much further into the competency-based education system as it will allow the students to learn on the effects of climate change and what they can do to mitigate these challenges, thus upping their environmental literacy knowledge. Invest in climate resilient infrastructure such as all-weather roads and bridges as this will ensure that pupils can access schools even during periods of heavy rainfall or flooding. Promote Community-Based Resilience Initiatives by supporting local communities to implement climate adaptation projects, such as afforestation, soil conservation, and water management, which can reduce the long-term impact of rainfall variability on school attendance and livelihoods.

Contribution to the Body of Knowledge

While previous studies have mainly connected climate change to educational disruptions at a much general perspective, this study offered empirical, localized evidence/ insights through a Kenyan rural context lens. This study – contextualized climate – education linkages, highlighted infrastructure such as roads, classroom and bridges vulnerability to climate change, linked food security to education continuity and food insecurity to education discontinuity, provided policy relevant insights and brought out the lived experiences of the study participants**.** Providing a deepening understanding of how climate change stressors manifest uniquely in specific communities, offering a replicable framework for other regions facing same challenges. In general, this study enhances policy and academic understanding of the convergence between climate change, infrastructure, food and water security, economic vulnerability, and education access, particularly in Kenyan marginalized rural communities.

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