

EXPLORING THE IMPACT OF CLIMATE CHANGE ON FOOD INSECURITY AND HEALTH IN RURAL GHANA

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BACKGROUND

Globally, around 1 in 3 people (2.3 billion) experienced food insecurity in 2021.

The UN Intergovernmental Panel on Climate Change (IPCC) identified that climate change aggravates factors globally which influence food security, with Africa being particularly affected.

West Africa has been described as a hotspot of climate change, experiencing rising temperatures, erratic rainfall, and extreme weather events.

Ghana is vulnerable to the effects of climate change, particularly in the northern regions, due to heavy reliance on rain-fed agriculture. High incidence of poverty, dependence on climate-sensitive activities for livelihoods and food, and underdevelopment mean that these under-served and hard-to-reach communities have less capacity to withstand climate shocks. This has the potential to threaten their food security and health.

AIM

To investigate the prevalence of household food insecurity, and whether adult residents perceive climate change to have had an impact on this and health in Mion (Northern Ghana).

METHODS

This is a mixed-methods pilot study using household surveys (n=397) and focus groups (n=16) to investigate the knowledge, attitudes, and practices (KAP) surrounding climate change, health, and food security of residents in Sang, within the Mion district, Northern Ghana. Mion is a largely rural district east of Tamale city in the Northern Region, with a population of ~95,000.

Participants were recruited using the random-walk method for the household survey. Rasch modelling analysed the prevalence of food insecurity using the Food Insecurity Experience Scale. Prevalences were compared to higher-level data from the Gallup World

Poll 2020–2022. Multivariate regression identified significant predictors of food insecurity. Satellite-derived monthly precipitation during the 12-month recall period for the food insecurity scale was compared with precipitation in the preceding 20 years.

A total of 16 key individual stakeholders in Mion were purposively selected to participate in focus groups; including farmers, pastors, healthcare workers, and tribal Chiefs. Thematic analysis identified participants' knowledge and views regarding the impact of climate change on food insecurity and their community.

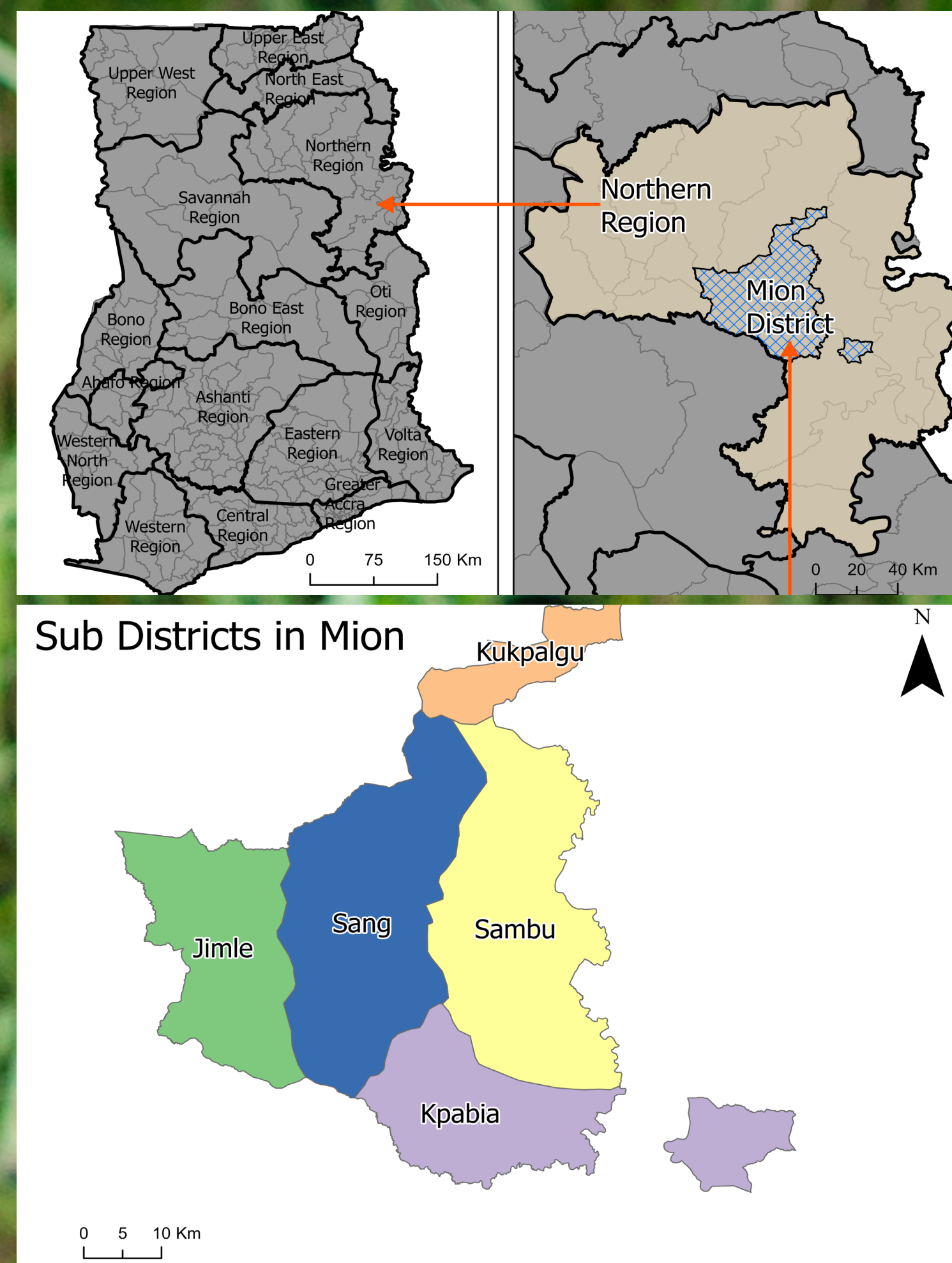


Figure 1. Map showing the location of the Northern Region in Ghana (top left), within which is the district of Mion (top right). There are 5 sub-districts within Mion (bottom). These maps were created by Dr Winfred Dotse-Gborgebortsi, University of Southampton. (source of boundaries: geoBoundaries)



Figure 2. Visual depiction of the different thresholds in the Food Insecurity Experience Scale, from the FAO.

RESULTS

Prevalence of food insecurity:

- 100% of the Mion respondents were food insecure to some level, and 94% described the situation as getting worse in the last 5 years.
- The prevalence of moderate or severe food insecurity is 61.5%, and the prevalence of severe is 26.4%; this is higher than Ghana's national scores and global data (Table 1).
- Looking at the World Bank Development Indicators for FAO-defined West Africa countries, there is a negative correlation between GDP per capita and food insecurity prevalence (Figure 3).

The prevalence measured in Mion is more reflective of the values experienced by the LICs, rather than the LMIC of Ghana.

- Larger households, 20–29-year-olds, and unemployed individuals experienced significantly ($p < 0.05$) greater food insecurity.
- How knowledgeable participants felt surrounding climate change was also a significant predictor. The more knowledgeable they felt, the less food insecurity they reported.

	Prevalence of moderate or severe food insecurity (%)	Prevalence of severe food insecurity (%)
Mion	61.5	26.4
Ghana (2020–22)	39.4	6.2
West Africa (2020–22)	64.1	21.2
Global standard (2020–22)	29.5	11.3

Table 1. Prevalence of food insecurity in Mion, compared to Ghana's prevalence and the global standard from the Gallup World Poll 2020–2022.16

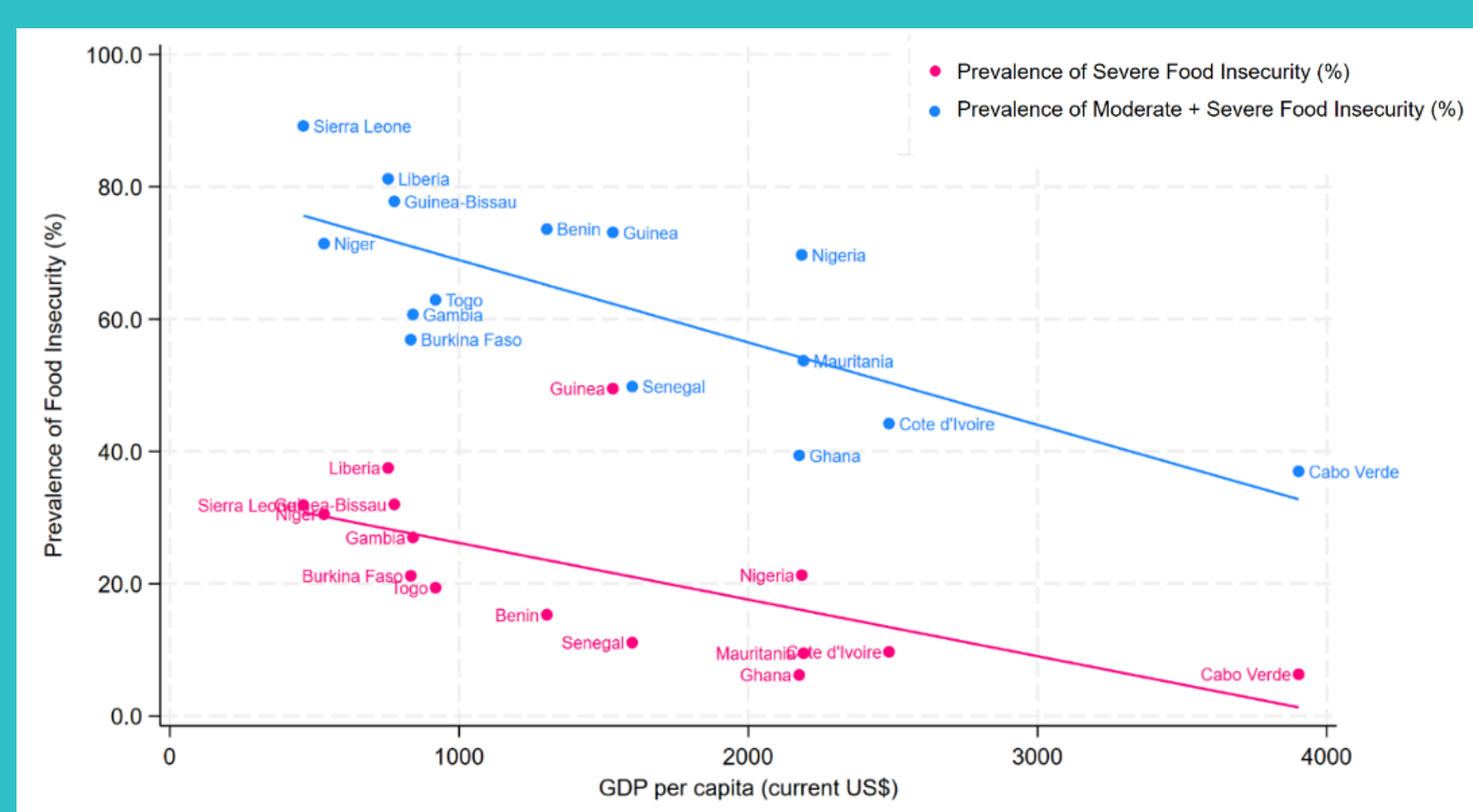


Figure 3. Graph showing GDP per capita (current US\$) recorded by the World Bank in 2022, against the percentage prevalence of food insecurity in West African countries, measured by the FAO in 2020–2022.

IMPACT OF CLIMATE CHANGE

When asked how climate change was affecting household food supply, 99.5% reported this was occurring via a negative facet, including: food shortages (79.1%), higher food prices affecting affordability (10.8%), unavailability of some items (4.8%), or the experience of chronic hunger (4.8%).

75.6% felt that climate change has already made a personal difference to their health.

Participants were asked about occasions where they had the intention to travel to a health centre in the last year, but chose not to because of adverse weather conditions (including heat and rainfall)–33.3% indicated this happened once or twice, and 45.3% said several times.

To summarise, participants unanimously agreed that the climate has changed over the years, particularly with noticeable decreases in rainfall and water scarcity. This hurts the environment, farming, and agricultural activities: “About climate change’s effects on our households, rainfall helps us grow crops for food. This time round no rain. Relating to food, there is no rain for us to farm and so there is no food for us to even give to our children to go to school.”

The primary causes and effects of climate change identified in the focus groups included bushfires, logging, deforestation for large-scale farming, food scarcity, heavy storms, and decreased crop yield. Participants attributed reduced rainfall patterns to some of these activities.

Participants expressed enthusiasm for ongoing community education and communication around climate change and health.

Precipitation analysis showed that this cross-sectional food insecurity survey did not take place during any abnormal extreme weather conditions; Precipitation patterns during the recall period for reporting food insecurity were similar to those in the 20 years preceding the survey.

CONCLUSION

The data demonstrate high prevalence of food insecurity, with worsened levels than national data. Factors such as age, household size, employment and knowledge of climate change are significant predictors of food insecurity. Interventions should therefore be designed in the context of the community and go beyond food availability.

Participants report that climate change is having a substantial impact on the food insecurity and health within this community. Building resilient communities is a global priority for government intervention. As climate change worsens, decision-makers should consider the specific challenges that these rural, agriculture-dependent areas face to their nutrition and health as they experience further climate shocks and stresses.