

Research Article**CLIMATE CHANGE AND IT EFFECTS ON PEACE AND SECURITY IN VULNERABLE REGIONS A
CASE OF TONGO FIELD, KENEMA DISTRICT SIERRA LEONE****^{1,*} Issa Alie Gbla, ²Ibrahim Munu, ³Ismail Sesay and ²Jonathan Sahr Kpakima**¹Department of Peace and Development Studies, Njala University, Sierra Leone²Department of Sociology and Social Work, Njala University, Sierra Leone³Department of Law, Njala University, Sierra Leone**Received 05th October 2025; Accepted 07th November 2025; Published online 19th December 2025**

Abstract

The study titled “Impacts of Climate Change on Peace and Security in Vulnerable Regions in Sierra Leone, a case of Tongo Field” Kenema District aimed to assess how climate change affects local stability and livelihoods in the Tongo Field community. The research adopted a cross-sectional design using mixed methods questionnaires, interviews, and focus group discussions with a sample of 50 respondents selected through stratified random sampling. The majority of participants were low-income earners, predominantly male, and mostly single. Findings revealed that only a quarter of respondents were aware of climate change and its impacts, while 62.5% perceived the rate of climate change in the area as very high. Major contributing factors included fossil fuel burning, deforestation, industrial activities, agriculture, and mining. The key effects of climate change reported were rising temperatures, coastal erosion, erratic rainfall, flooding, food shortages, water scarcity, and droughts. In response, community members adopted coping mechanisms such as new farming and fishing practices, dialogue and negotiation, reliance on humanitarian aid, and migration. About 56.3% of respondents acknowledged challenges in tackling climate change, which included lack of funding and technical expertise, weak policies and enforcement, poor stakeholder coordination, low community engagement, political instability, inadequate research data, and cultural barriers. The study recommended that government strengthen policies and infrastructure, NGOs enhance awareness and pilot adaptation programs, and communities adopt grassroots sustainable practices. It also emphasized collaboration among CSOs, local and international partners to invest in flood-resistant infrastructure and improve water systems. Additionally, education and awareness campaigns through workshops, radio programs, posters, and school clubs were encouraged to promote climate adaptation and mitigation practices, fostering resilience and environmental sustainability in vulnerable communities.

Keywords: Climate change, Tongo.**INTRODUCTION**

Globally, the intersection between climate change and security has gained international recognition. The UN Security Council acknowledged this linkage in its Presidential Statement (SC 13189) of January 2018, emphasizing how climate change contributes to violent conflicts in regions such as West Africa and the Sahel. In September 2021, the Council held another high-level open debate on “*Maintenance of International Peace and Security: Climate and Security.*” This reflects a growing consensus that environmental degradation and climate variability pose substantial threats to peace, stability, and sustainable development. Climate change has become a defining issue of the 21st century, particularly after the 2007 Nobel Peace Prize was awarded to the Intergovernmental Panel on Climate Change (IPCC) and Al Gore for their efforts to raise global awareness. The IPCC’s Fourth Assessment Report (AR4) of 2007 advanced the debate by consolidating scientific consensus that climate change is a human-induced phenomenon with severe long-term consequences. The AR4 highlighted that the effects of global warming rising temperatures, erratic rainfall, and extreme weather are not future prospects but current realities. These phenomena are now influencing agricultural systems, water resources, and social stability worldwide. While many countries and international bodies have begun implementing mitigation strategies such as reducing carbon emissions scientists agree that mitigation alone cannot prevent the short- and medium-term consequences already set in motion.

Thus, the focus must also shift toward adaptation, helping societies build resilience to changing climatic conditions. As the Stern Review (2006) and IPCC Working Group II emphasize, adapting to climate change requires robust governance, strong institutions, and proactive socio-economic policies. The most affected populations are typically those living in fragile states, marked by poverty, weak governance, and limited adaptive capacity. For these societies, climate change exacerbates existing vulnerabilities reducing agricultural productivity, triggering displacement, and heightening the risks of food insecurity, resource conflicts, and mass migration. As Dan Smith and Janani Vivekananda (2007) argue, fragile states face a “double-headed problem” where climate stress and violent conflict reinforce each other in a vicious cycle of poverty and instability. However, they also note the potential for a “*virtuous cycle*” if adaptation measures and peacebuilding efforts are pursued simultaneously. Effective governance and peacebuilding can strengthen communities’ resilience to climate change, turning a potential source of division into an opportunity for cooperation and peace. Africa is recognized as one of the regions most vulnerable to the adverse impacts of climate change, despite contributing the least to global greenhouse gas emissions. The International Institute for Sustainable Development (IISD, 2009) identifies climate change as both an environmental and security threat across the continent. Scientific and political consensus suggests that Africa faces rising temperatures, increased sea levels, erratic rainfall, prolonged droughts, and more frequent extreme weather events. These changes are projected to reduce agricultural productivity, intensify food and water scarcity, and increase competition over natural resources conditions that can heighten the risk of intra- and

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inter-state conflicts. The security implications of climate change are especially severe in Sub-Saharan Africa (SSA), where economies are highly dependent on rain-fed agriculture. Climate-induced disruptions such as pest outbreaks, soil degradation, and desertification directly threaten livelihoods. For instance, prolonged droughts in the Horn of Africa and floods in West Africa have displaced millions, while changing precipitation patterns contribute to tensions over transboundary water resources such as the Nile Basin and Lake Chad. The IISD (2009) notes that “the impact of climate change will fall disproportionately on the world’s poorest countries, many of them in Africa,” where adaptation is a matter of “sheer survival.”

Climate change thus poses a significant challenge to achieving the Millennium Development Goals (MDGs) and broader Sustainable Development Goals (SDGs). It undermines progress in agriculture, water management, health, and governance. The lack of precise data on economic losses due to climate change in Africa compounds the challenge of effective planning. Nevertheless, there is growing recognition that climate information systems, regional cooperation, and international agreements on mitigation, adaptation, and compensation are essential for addressing these risks. Importantly, while climate change may not directly cause inter-state wars, its consequences particularly water and food scarcity have already contributed to political tensions that hinder development and stability across the continent. Sierra Leone, located in West Africa, faces similar vulnerabilities. With a population of about 7.5 million according to Statistics Sierra Leone and a tropical monsoon climate, the country experiences distinct rainy and dry seasons influenced by the Inter-Tropical Convergence Zone (ITCZ) and the West African Monsoon. Variations in rainfall, temperature, and wind patterns have intensified in recent decades due to climate variability and environmental degradation caused by deforestation, unsustainable mining, and poor agricultural practices.

According to UNDP (2012), these conditions have increased the frequency of floods, erosion, and landslides, particularly in urban areas like Freetown. Sierra Leone’s weak infrastructure and limited institutional capacity make it difficult to respond effectively to these disasters. Moreover, the degradation of forests and water catchments directly affects hydropower production, agricultural productivity, and public health. The country’s exposure to diseases such as malaria and diarrhoea is also heightened by changing climate conditions. The Government of Sierra Leone (GoSL) recognizes the urgent need to integrate climate adaptation into national development planning. In 2018, it launched its National Adaptation Plan (NAP) process with support from the UNFCCC and Environment Protection Agency Sierra Leone (EPA-SL). The NAP aims to mainstream adaptation into all levels of governance, improve institutional coordination, and strengthen resilience through technology transfer, stakeholder participation, and sustainable resource management. The 2021 NAP Framework emphasizes alignment with the Paris Agreement, Nationally Determined Contributions (NDCs), and SDGs, underscoring the government’s commitment to addressing climate-induced risks in a systematic and inclusive manner. Climate change presents a profound and multidimensional threat to global peace and national security, as its escalating effects rising temperatures, prolonged droughts, desertification, sea-level rise, and extreme weather

events intensify social instability, resource scarcity, and geopolitical tensions. Globally, the impact of these environmental changes fuels competition over dwindling resources such as freshwater and arable land, often leading to cross-border disputes. Rising sea levels threaten entire territories, displacing millions and creating waves of climate refugees whose movements strain neighboring countries and destabilize fragile regions. At the national level, climate change undermines economic stability, particularly in sectors like agriculture, energy, and water resources. These disruptions heighten poverty, food insecurity, and social unrest, especially among marginalized communities with limited adaptive capacity. In developing countries such as Sierra Leone, the effects are severe. In regions like Tongo Field in Kenema District, where livelihoods depend on artisanal mining and subsistence farming, erratic rainfall, soil degradation, and rising temperatures have intensified competition over natural resources. This has led to increased resource-based conflicts, disputes over mining and water access, and tension among local groups. Weak governance and poor conflict-resolution mechanisms further exacerbate these challenges, while climate-induced migration and displacement strain already limited infrastructure, escalating the potential for violence and undermining sustainable development. Climate change also directly impacts national security systems by compromising infrastructure, disrupting supply chains, and diverting resources toward emergency response and recovery. The growing burden on national budgets and governance systems reveals the urgent need for integrated strategies to address the climate-security nexus. Despite the critical nature of these challenges, there remains a lack of focused research and policy interventions linking climate change, resource competition, and security risks in vulnerable regions like Tongo Field. This study therefore seeks to explore the intersection between climate change, peace, and national security in Sierra Leone, using Tongo Field as a case study. It emphasizes the need for interdisciplinary and adaptive approaches including resilient governance, regional cooperation, and sustainable infrastructure investments to build societies capable of withstanding and mitigating climate-related threats. Failure to act risks perpetuating cycles of conflict, undermining peace, and threatening long-term global and national stability.

Literature Review

Global warming, also known as climate change, is recognized as the most severe threat to humanity in the 21st century, surpassing past global crises like plagues and pandemics (Bowen, Mattia & Stren, 2010; Bloem *et al.*, 2010). With the world’s population expected to reach 9 billion by 2050, mainly in developing countries, challenges such as food insecurity, water scarcity, and increased natural and human-induced disasters are intensifying (Crowley, 2000; McMichael, 2001). Both natural factors like volcanic eruptions, solar variations, and ocean currents and human activities, including fossil fuel combustion, deforestation, and land-use changes, contribute to climate change (Paehler, 2007). The resulting impacts rising sea levels, melting ice caps, and extreme weather events pose grave global risks. Despite extensive research and global efforts by bodies such as the IPCC and UNFCCC, the accelerating increase in greenhouse gas emissions calls for urgent mitigation and adaptation measures, as emphasized by U.S. Onoja *et al.* (2011) in their review of the causes, effects, and solutions to climate change.

The Functionalist Theory

This paper employs the functionalist theory to interpret climate change and its environmental impacts, emphasizing that societal institutions and systems must work collaboratively to maintain stability and survival (Crossman, 2020; Nickerson, 2023). Drawing on Durkheim's ideas of social solidarity and moral regulation (Pope, 1975), it identifies climate change as a consequence of human activities such as deforestation, fossil fuel use, and pollution driven by self-interest (Dominicis *et al.*, 2017; Tyagi, 2022). Functionalists argue that addressing climate change requires collective global cooperation and equitable policies, yet disparities between developed and developing nations where Africa invests only 0.42% of GDP in research compared to the global average of 1.7% (Midega *et al.*, 2021) hinder progress. While global solutions like carbon taxes, renewable energy promotion, afforestation, and climate education are crucial (Wildburger, 2004; Krogstrup & Oman, 2019), persistent high emissions and fossil fuel dependency continue, leaving Africa especially vulnerable due to weak governance, poverty, and limited adaptive capacity (Guillaumon & Simonet, 2011; UN Climate Change, 2020). The paper concludes that integrating climate action with Africa's development priorities is essential for ensuring societal stability and the sustainability of human life on Earth.

The Concept of Climate Change

The origins of climate change date back to the 19th century when scientists like John Tyndall, Svante Arrhenius, and Guy Callender first linked human activities especially fossil fuel combustion to rising global temperatures. Although initially dismissed, later research confirmed that human-induced carbon emissions drive global warming, intensifying natural disasters such as floods, droughts, and heat waves. In Africa, these environmental changes have exacerbated resource-based conflicts, particularly between herders and farmers, exposing the continent's vulnerability due to limited adaptive capacity (Siphelele N Mahlaba *et al.*, 2024). Contemporary debates highlight the inequality between developed and developing nations, as wealthy countries remain the largest emitters while poorer nations face the harshest impacts (Tietjen, 2022). The UNFCCC (2022) recognizes that although climate change indirectly fuels conflicts, poor governance and socioeconomic issues worsen the situation. African leaders argue for fair support from industrialized nations to transition to clean energy without compromising urgent development needs, noting that Africa contributes only 3.8% of global emissions (Kamer, 2022; Tongia, 2022).

Effects of Climate Change on Agriculture, Environment, and Security

Climate scientists employ sophisticated computer models to analyze temperature, precipitation, and atmospheric circulation patterns to understand climate change and predict its consequences. Their projections suggest profound impacts on weather, glacial ice, sea levels, agriculture, wildlife, and human health. Among these, agriculture is one of the most vulnerable sectors, as it heavily depends on climate conditions. In Africa, where agriculture is predominantly rain-fed, climate change poses a severe threat to livelihoods and food security. Frequent droughts, floods, and unpredictable rainfall patterns are already straining agricultural productivity, food supply, and water resources. As the continent faces increasing climate-

related challenges, the agricultural sector stands at the frontline of its consequences, directly influencing economic stability, land use, and human survival.

Effects on Agriculture and Land Use

Climate change affects agricultural productivity through alterations in temperature, rainfall, and CO₂ concentration. According to Rosenzweig and Hillel (1995), small temperature increases might enhance productivity but not necessarily in the same regions. Luo *et al.* (1999) and SWCS (2003) note that climate-induced droughts, floods, and growing season shifts lead to lower yields and food shortages. Semi-arid regions, especially in Africa, face worsening conditions due to impoverished soils and increased desertification (Manstrandrea & Schneider, 2009). Rising CO₂ levels influence crop types differently C3 crops (such as cassava, rice, and soybeans) may initially benefit more than C4 crops (such as maize, millet, and sorghum), which already operate near optimal CO₂ conditions (FME, 2003). However, these benefits are limited by changing phenological patterns, with altered crop cycles potentially reducing yields.

Effects on Soil and Water Availability

Climate change exacerbates soil erosion and nutrient depletion. Increased storm intensity causes heavier rainfall and runoff, leading to erosion in humid regions, while droughts and wind erosion threaten arid zones (FME, 2003). Warmer temperatures accelerate organic matter decomposition, diminishing soil fertility and requiring greater fertilizer use, which in turn risks polluting air and water systems (Rosenzweig & Hillel, 1995). Water availability is equally threatened, as climate change alters rainfall distribution and evaporation rates (Rosenzweig & Hillel, 1995). Africa has experienced recurring droughts since the 1970s (Paehler, 2009), with projections indicating longer and more severe dry periods (World Bank Group, 1998). Rising temperatures increase irrigation demands, necessitating expensive infrastructure investments (Southworth *et al.*, 2002).

Effects of Higher Temperatures and Vegetation Changes

Increased temperatures accelerate plant respiration, reducing net productivity and yields. When heat exceeds biological thresholds, crops face stress and premature maturation (IPCC, 2001). Nigeria, for instance, has recorded a 0.4°C increase in mean annual temperature over two decades, affecting multiple sectors including agriculture, health, and water resources (FME, 2003). Vegetation patterns are also shifting; moderate warming and rainfall can enhance growth and carbon sequestration, but extreme changes lead to plant stress, die-offs, and desertification (Bachelet *et al.*, 2001). Between 1982 and 1999, global vegetation productivity increased by 6%, but later declined due to prolonged heat and drought (Zhao & Running, 2010). Such shifts disrupt animal habitats and migration, leading to ecosystem imbalances.

Effects on Pests, Diseases, and Food Security

Warmer, humid climates favor the proliferation of pests and diseases, affecting crops and livestock. Altered wind patterns influence pest dispersal and the spread of bacterial and fungal diseases. Livestock diseases increase with heat stress and changing ecosystems (Manstrandrea & Schneider, 2009).

Extreme weather events like floods and droughts can trigger pest outbreaks and disrupt ecological balances. Warmer conditions also increase food spoilage and mycotoxin risks in stored produce (FME, 2003). The Intergovernmental Panel on Climate Change (IPCC, 1996b) highlights that while some regions may benefit from increased productivity, tropical areas like Africa will face yield declines. Given that agriculture employs 70% of Africa's workforce and contributes 40% to its GDP (Paehler, 2009), any disruption has grave implications for food security, poverty, and development.

Effects on Natural Disasters and Security Risks

Climate change intensifies the frequency and severity of natural disasters such as floods, droughts, and storms. Developing countries are disproportionately affected, with 90% of disaster victims living in vulnerable areas (IPCC, 1996b). Examples include floods in Nigeria and Benin, droughts in East Africa, and extreme temperature fluctuations globally (Sodangi *et al.*, 2012). These disasters aggravate food insecurity, displacement, and economic instability. Climate-related disruptions also increase competition over scarce resources like land and water, heightening tensions and insecurity. In Africa, countries such as Somalia, South Sudan, and Mali exemplify how climate variability interacts with existing political and social vulnerabilities to fuel conflict (Grand, 2021). Droughts and floods disrupt livelihoods, cause displacement, and intensify competition between farmers and herders. Armed groups and elites exploit these vulnerabilities, further destabilizing societies.

Climate, Conflict, and Human Security

The nexus between climate change and security has gained international recognition. The UN Security Council and African Union now integrate climate security considerations into peacekeeping and development initiatives. However, researchers caution that the climate–conflict relationship is complex and often mediated by governance, inequality, and resource management (Grand, 2021). Climate-related security risks (CRSRs) provide a nuanced approach to understanding these dynamics, focusing on how climate stress interacts with socio-political contexts. Four key pathways link climate change to conflict: livelihood deterioration, forced migration, elite exploitation, and armed group manipulation. For example, in Somalia, drought-induced displacement has triggered communal tensions; in South Sudan, livestock scarcity and elite control over cattle markets fuel raids and militia mobilization; in Mali, resource disputes over land and water have merged with ethnic and political conflicts, escalating violence (Tarif, 2021). Climate change poses a multifaceted threat to agriculture, environment, and security especially in Africa. It reduces crop yields, degrades soils, depletes water resources, fosters pests and diseases, and worsens food insecurity. Beyond these direct impacts, it also undermines social stability by intensifying competition over resources, fueling migration, and exacerbating existing political and ethnic tensions. The growing recognition of climate-related security risks by global and regional organizations marks a critical step toward integrated solutions. Addressing these challenges requires a holistic approach combining climate adaptation, sustainable agriculture, and conflict-sensitive governance to safeguard food security, ecological stability, and human well-being in a rapidly changing climate.

METHODOLOGY

The study utilized a cross-sectional design with mixed research methods, incorporating both questionnaires and interviews. It adopted a descriptive survey approach, which, according to Tromp (2006), is suitable for examining social phenomena that cannot be controlled or manipulated. This method enabled the researcher to analyze and interpret the effects of climate change on the socio-economic development of the Tongo Field community in Kenema District. The design also facilitated the assessment of respondents' attitudes, opinions, and behaviors on various social and educational issues within a large population. Following Agyedu, Donkor, and Obeng's (1999) definition of population as a complete set of individuals or objects sharing common characteristics, the study focused on Sierra Leoneans aged 18–46 and above living in Tongo Field. Using a stratified sampling technique, the researcher selected participants from different subgroups and administered 50 questionnaires to men and women involved in community decision-making. The study population included farmers, miners, youths, stakeholders, and citizens of the Tongo Field community.

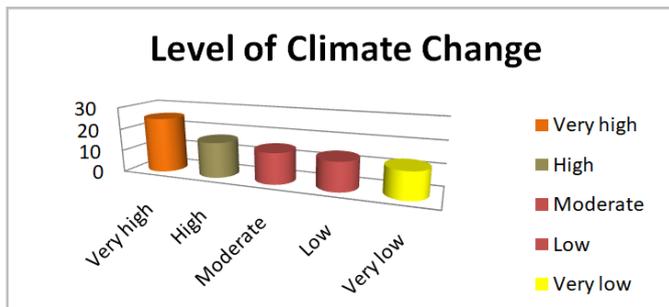
Table 1. Showing the sample size of this research

Structure for Participants	Target Population (N)
Civil society	15
NGO's/Government officials	20
Local council officials (District Council)	15
Community stakeholders	30
Total	80

Source: Data collected from field consultations as documented by the researcher (2025).

RESULTS AND DISCUSSION

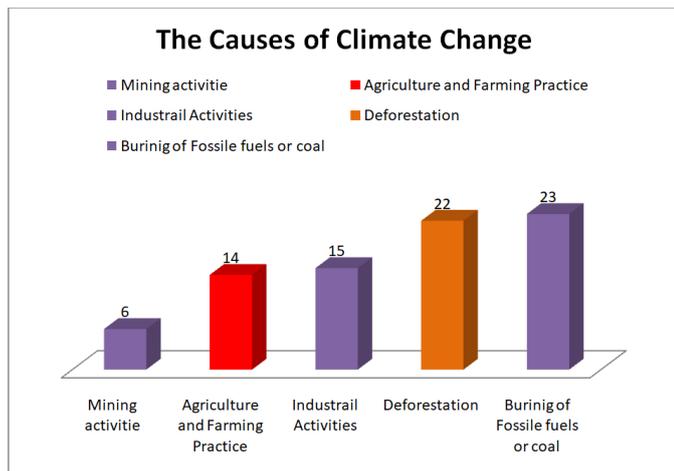
The study revealed that awareness of climate change is relatively high in the study community; with about one-quarter of respondents acknowledging familiarity with the issue and 97.5% confirming they had heard about it. The main sources of climate change information were radio, television, social media, government agencies, NGOs, and community meetings. A majority (62.5%) of respondents perceived the rate of climate change in the community as very high. The findings identified major human-induced factors contributing to climate change, including fossil fuel burning, deforestation, industrial and agricultural activities, and mining. Respondents also noted that energy production, mining, agriculture, urbanization, and transportation are key sectors driving climate change in the area. Furthermore, 85% of respondents believed that climate change has contributed to conflict and insecurity, citing issues such as water conflicts, land disputes, resource-based violence, migration tensions, and farmer-herder clashes. The community experiences rising temperatures, coastal erosion, irregular rainfall, flooding, food shortages, water scarcity, and droughts conditions that respondents agreed pose serious threats to peace and security. The findings further indicate that most respondents perceive a significant level of climate change in the study community. Specifically, 31.3% rated the rate of climate change as *very high*, 20% as *high*, 17.5% as *moderate*, 16.3% as *low*, and 15% as *very low*. Overall, the results suggest that the rate of climate change is generally considered *very high* in the community. Below is a figure indicating the rate and awareness of Climate change



Source: Field Survey-2025

Figure 1.

The data reveal that the main causes of climate change in the study area are primarily linked to human activities. The majority of respondents (28.8%) identified the burning of fossil fuels or coal as the major contributor, followed by deforestation (27.5%), industrial activities (18.8%), agricultural and farming practices (17.5%), and mining activities (7.5%). This indicates that energy use and land exploitation are the leading drivers of climate change in the study community. Below is a figure 2 indicating the causes of Climate change.



Source: Field Survey –2025

Figure 2.

The findings indicate that respondents identified several key effects of climate change in the study area. Specifically, 26 (30.6%) observed rising temperatures and coastal erosion, 24 (28.2%) reported changes in rainfall patterns and flooding, 23 (27.1%) mentioned food shortages, and 12 (14.1%) noted water scarcity and droughts. Overall, respondents agreed that these issues rising temperatures, coastal erosion, erratic rainfall, flooding, food shortages, and water scarcity are major effects of climate change experienced in the community. Table 1 indicating the causes of Climate change

Table 2. The effects of climate change

Responses	AF	RF (%)
Rising temperatures and coastal erosion	26	30.6
Changes in rainfall patterns and flooding	24	28.2
Food shortages	23	27.1
Water scarcity and droughts	12	14.1
Total	80	100

Source: Field Survey –2025

The findings in Table 2 indicate that stakeholders in the study area face several challenges in addressing climate change. The most reported issues include lack of funding/resources and

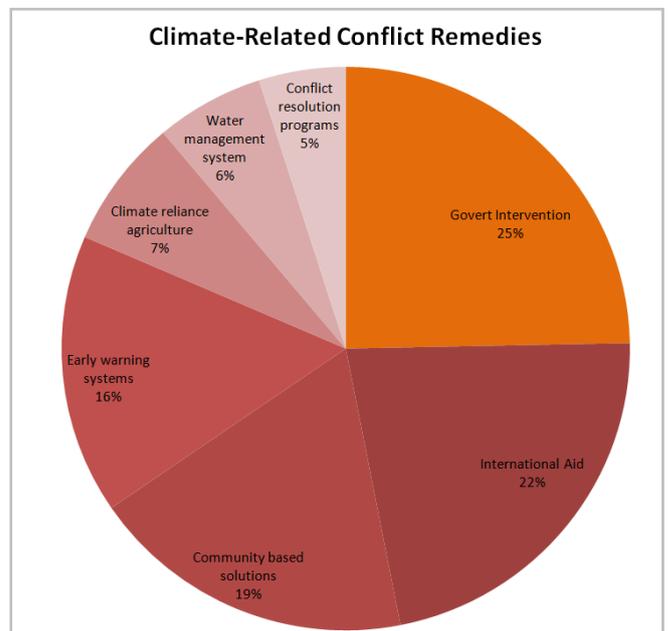
limited technical expertise (30.6%), followed by inadequate policy frameworks, poor coordination among stakeholders, and weak enforcement of environmental regulations (28.2%). Additionally, 27.1% of respondents cited limited community engagement and political instability, while 14.1% mentioned insufficient data, lack of research, and cultural or traditional barriers. Below is a table indicating the challenges faced with in curbing Climate change

Table 3. The challenges faced with in curbing Climate change

Responses	AF	RF (%)
Lack of funding/resources and limited technical expertise	26	30.6
Inadequate policy frameworks, poor coordination among stakeholders, and weak enforcement of environmental regulations	24	28.2
Limited community engagement and political instability	23	27.1
Insufficient data and research and cultural and traditional barriers	12	14.1
Total	80	100

Source: Field Survey –2025

The findings in Table 3 indicate that respondents identified several key supports needed to reduce climate-related conflicts in the study community. The majority (25%) emphasized government interventions, followed by international aid (22%) and community-based solutions (19%). Other suggested supports include early warning systems (16%), climate-resilient agriculture (7%), water management systems (6%), and conflict resolution programs (5%). This shows that respondents prioritize stronger government and international involvement alongside local initiatives to address climate-related conflicts effectively. Below is a figure 3 indicating the remedies to reduce climate-related conflicts.



Source: Field Survey –2025

Figure 3.

Conclusion

The study on the effects of Climate Change on Peace and Security in Vulnerable Regions in Sierra Leone, focusing on Tongo Field, reveals that climate change is a multidimensional threat affecting both the environment and social stability. It shows that erratic rainfall, rising temperatures, flooding, and land degradation have disrupted agriculture and water supply,

increasing competition over scarce natural resources. These challenges, coupled with limited livelihood options and weak governance, have led to community tensions, weakened social cohesion, and hindered peace building efforts. The study highlights that climate-induced displacement, food insecurity, and loss of income can escalate into local disputes, petty crime, and violence, especially where institutional capacity is poor. It concludes that the link between climate change and insecurity in Tongo Field reflects a complex interaction of environmental stress, economic hardship, and governance failures. To address these risks, the study recommends integrated, context-specific interventions that promote climate adaptation, sustainable livelihoods, early warning systems, stronger local governance, and inclusive dialogue to enhance community resilience and peace.

Recommendations

The document emphasizes that mitigating the impacts of climate change on peace and security in Tongo Field requires coordinated, multi-level action involving local, national, and international stakeholders. It calls for the strict enforcement of environmental protection laws including bans on deforestation, emission limits, and proper waste management. Climate change adaptation should be mainstreamed into local development plans, supported by investments in flood-resistant infrastructure such as roads, drainage, and water systems. The document advocates for renewable energy initiatives like solar mini-grids and small-scale technologies (e.g., solar pumps, clean cook stoves) to reduce fossil fuel dependence. It further recommends promoting climate-smart agriculture through training, subsidies for drought-resistant seeds, organic fertilizers, and efficient irrigation. The establishment of early warning systems for floods and droughts, reforestation and mangrove restoration, and community forests with legal protection are also prioritized. To enhance public awareness, it proposes community education programs, use of media and school clubs, and engagement of traditional and religious leaders. Finally, the document highlights the importance of community participation, including youth and women's climate committees, micro-grants for eco-friendly businesses, data sharing with policymakers, and partnerships with local councils and international agencies to strengthen environmental governance and resilience.

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