

Perceptions and Management of Climate Risks in Togo: Community Analysis of Disaster Governance

Massama-Esso P. ASSIAH¹

West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL), Department of Geography, Faculty of Human and Social Sciences, Université de Lomé, Lomé, Togo

Kossivi HOUNAKE²

Faculté de Droit, Université de Lomé, Lomé, Togo

Abstract:- A comprehensive study on perceptions and management of climate risks in Togo was undertaken, involving a diversity of stakeholders such as local communities, government authorities and non-governmental organizations (NGOs). Adopting a diverse methodology, combining direct interviews, individual interviews and focus groups, it was followed by a qualitative and quantitative analysis of data covering all six regions of Togo. The results reveal that 97.70% of participants recognize climate change in recent decades. Significant regional variation in recognition of climate change was observed; the Kara region being in the lead with 60.34% of participants identifying this change, while only 5.75% did so in the Grand Lomé region. Climate risks such as droughts, strong winds and epidemics have been identified as major concerns in different regions of Togo. For example, in the Maritime region, almost half of participants (46%) report two droughts per year, while in the Plateaux region, 39% of respondents report experiencing three to four droughts per year. Additionally, 37.01% of participants in the Kara region report an annual occurrence of strong winds. When it comes to climate risk management, strategies such as dam construction, early warning systems, and community awareness and training have been widely adopted. However, significant variations were observed in the perception of the effectiveness of surveillance and early warning mechanisms across different regions. In conclusion, this study provides information to guide efforts to strengthen Togo's resilience to climate challenges. The recommendations made in this article aim to improve risk management capacities, develop climate-responsive policies and promote multi-sector collaboration, thereby contributing to long-term sustainable and inclusive development.

Keywords:- Perception, Management, Governance, Community, Climate Risk, Togo.

I. INTRODUCTION

Togo, the jewel of West Africa, is faced with a diversity of climatic challenges characterized by a climatic anomaly which impact its populations and its socio-economic development. With a tropical climate marked by a dry season and a rainy season, the country faces varied climatic risks

ranging from floods to droughts, including tropical storms and coastal erosion. The Togolese population, spread across the entire territory, faces these climatic challenges which have significant repercussions on livelihoods, agriculture, infrastructure and food security. Floods in coastal regions, droughts affecting agricultural yields and devastating tropical storms are all phenomena that are straining the resilience of Togolese communities. Faced with these challenges, the Togolese government has implemented the National Plan for Adaptation to Climate Change (PNACC), an ambitious strategy aimed at strengthening the resilience of populations and ensuring sustainable development by 2030. Through this plan, Togo is committed to promoting adaptation to climate change and putting in place policies and concrete measures to address climate risks. In this context, several government and civil society actors are mobilized to manage climate risks and promote resilience at the national and local level. Local initiatives such as reforestation are accentuated by the establishment of June 1st of each year, a date with forest resonance in the minds of the Togolese citizen; it is National Tree Day, established in 1977 by the late General GNASSINGBE Eyadéma. Sustainable irrigation systems and awareness campaigns are deployed to strengthen the capacity of communities to face climate challenges. It is essential to remember that the management of climate risks in Togo is of capital importance in the current global context of the fight against climate change. The country faces internal challenges in adapting to the changing climate, while playing an active role in global efforts to limit the dire consequences of extreme weather conditions. This study has the merit of paying particular attention to the perceptions and experiences of local communities in the face of climate risks. By collecting the testimonies and points of view of affected populations, it is possible to better understand the social, economic and environmental impacts of extreme climatic events. The analysis of community resilience practices and initiatives constitutes an essential part of this re-search. By examining the adaptive strategies put in place by local communities, it is possible to identify good practices and lessons learned in climate risk management. This research is guided by several fundamental questions: What are the perceptions of local populations regarding climate change and its effects? What policies and strategies have been put in place by the authorities to manage climate risks? To what extent are these measures effective and adapted to the needs of local populations? And what are the prospects for improving the

governance of climate risks in Togo? By answering these questions, this study aims to provide valuable “insights” to inform policy makers, development practitioners and civil

society actors on the actions to be taken to strengthen Togo's resilience to climate change.

II. STUDY AREA

The Republic of Togo is situated in West Africa, along the Gulf of Guinea, encompassing latitudes 6°N to 11°N (Figure 1). It shares borders with Ghana to the west, Benin to the east, and Burkina Faso to the north (World Bank, 2023).

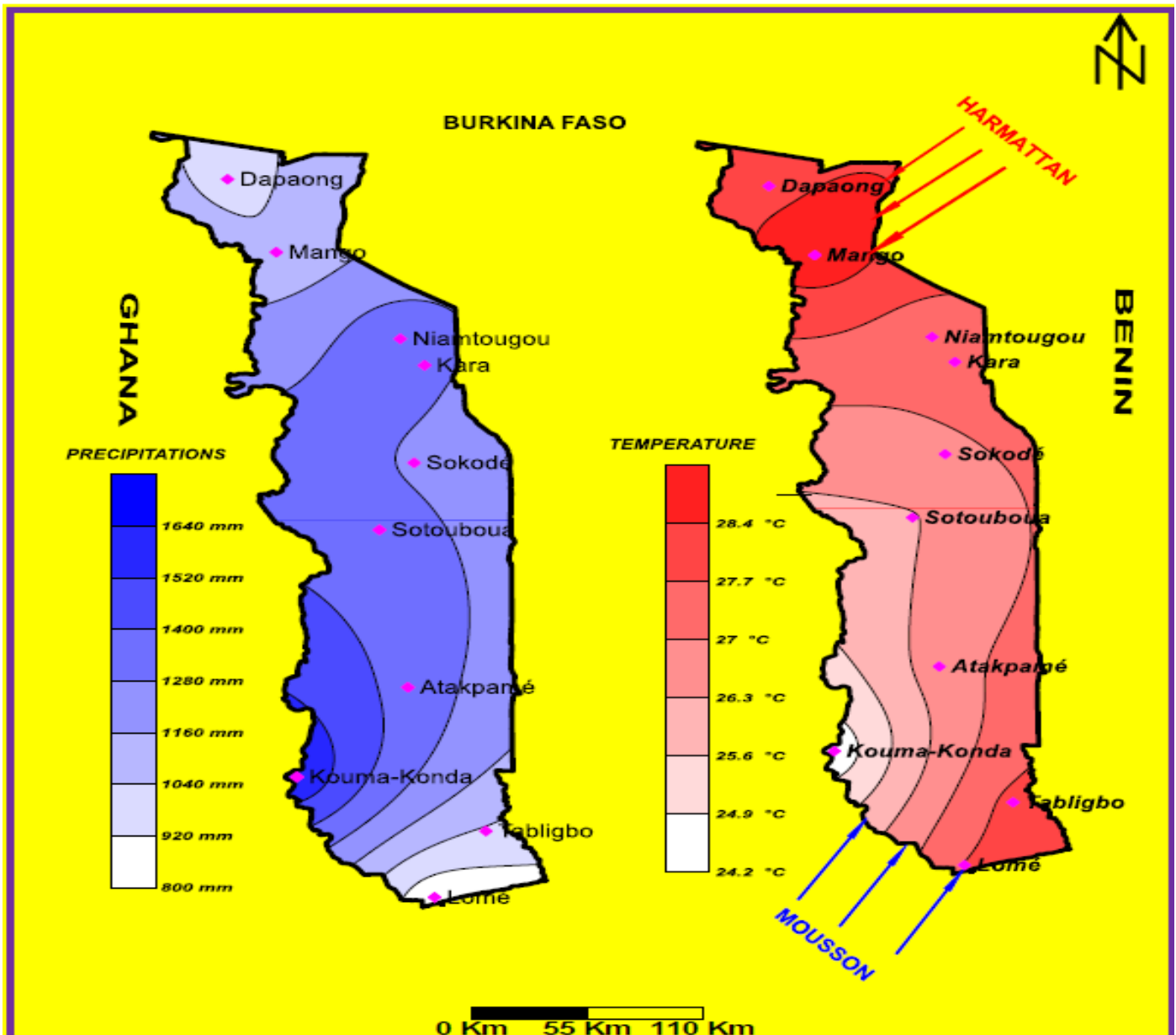


Fig 1 Study Area and Climatic Map (ANPC, 2020)

The southern coastline spans 56 kilometres (km) and lies on the Gulf of Guinea. Covering an area of 54,600 km², the country features diverse geographical characteristics, including rolling hills in the north, a southern plateau, and a low coastal plain with extensive lagoons and marshes.

Togo's population faces significant challenges, with approximately 69% of rural households currently living below the poverty line. The country's climate varies from tropical to savanna. The southern region experiences high

humidity, with an average annual temperature of 27°C. In the north, temperature fluctuations are more pronounced, ranging between 17°C and 41°C. Rainfall patterns in the southern part of the country follow two distinct seasons: the first occurring from mid-March to late July, and the second from early September to early to mid-November. The dry desert winds known as the Harmattan blow from the northeast, bringing cool and dry weather between November and March. Periodic droughts also affect the northern regions (ANPC, 2020).

Togo's poverty levels and reliance on rain-fed agriculture and livestock leave it particularly vulnerable to climate change. This vulnerability limits the capacity of poor households and communities to manage climate risks, increasing their susceptibility to climate-related shocks. The country is projected to face an increase in weather-related hazards as a result of climate change. Sectors such as agriculture, energy, health, housing, water resources, and coastal areas are expected to be particularly vulnerable to these climatic changes. Coastal erosion is a pressing concern, as it may worsen with future climate change, leading to the loss of valuable goods and services. Notably, more than 90% of the country's industrial units are located in coastal areas, amplifying the potential impact of such changes. Togo is classified into five (5) ecological zones. The northern plains are dominated by dry forests and dry savannas, whereas the northern branch of Togo Mountains is largely covered by clear forests, diversified savannas, forested gorges, and dense woods. The third zone is the central plain, which is characterized by dry forests and dry savannas distinguished by trees and bushes. Zone IV is the southern branch of the Togo Mountains, which is covered in true evergreen woods. Last but not least, Zone V is associated with the coast (ANPC, 2020).

III. METHODOLOGY

For this study on perceptions and management of climate risks in Togo, we developed a methodology that integrates a diversified and integrated approach, aiming to obtain a complete understanding of local dynamics and management practices. The geographical scope of the study includes the six regions of Togo: Central, Greater Lomé, Kara, Maritime, Plateaux and Savane, thus ensuring adequate representativeness and consideration of local diversity. Participants include members of local communities, traditional leaders, representatives of non-governmental organizations (NGOs) involved in risk management, as well as authorities responsible for climate change, including the Ministry of Environment and Forest Resources (MERF) and the National Civil Protection Agency. Data collection took place using a mixed approach, combining direct interviews using tablets and the Kobocollect application, individual interviews and focus groups. This methodology offered us diverse stakeholder participation. In total, we were able to interview 1023 people, allowing for a meaningful representation of diverse perspectives and realities across the country. As for the data analysis, it was exhaustive, using both qualitative and quantitative analysis methods. Qualitative analysis explored participants' perceptions and experiences, while quantitative analysis identified trends. Steps were taken to ensure informed consent, confidentiality and respect for the rights of participants throughout the

research. By integrating a mixed approach to data collection and covering a wide range of regions and stakeholders, this research aims to provide an in-depth understanding of the challenges and opportunities related to climate risk management in Togo. The collected data were then processed, cleaned and analyzed using Excel software. First, the data was reviewed and cleaned to remove errors, outliers, and potential inconsistencies. Once the data was cleaned, it was organized and structured into Excel spreadsheets, allowing for efficient management and easy navigation through the different variables and associated data sets. Data analysis using Excel involved the use of various features and tools available in the software. Additionally, charts and visualizations were created to visually represent the analysis results. Overall, using Excel as an analysis tool allowed for flexible manipulation of data and facilitated the generation of accurate and informative results.

IV. RESULTS

A. Perception of Climate Risks in Togo

➤ Analysis of Local Perceptions on Climate Change

The results of the analysis of local perceptions on climate change in Togo highlight a deep awareness of this phenomenon among residents. Among those with more than 5 years of seniority in their locality, a high percentage of 97% recognize climate change in recent decades. This recognition is all the more significant given the long duration of residence of many participants in their community, with 51% living in the same locality for more than 10 years. This long-standing experience provides valuable insight into observed changes in local climatic conditions, thereby reinforcing the legitimacy of local perceptions. It is interesting to note the regional variations in the perception of climate change. For example, the Kara region has the highest percentage of recognition of climate change, with 60% of participants identifying it, while in the Grand Lomé region this figure is notably lower, at just 5%. These variations highlight the importance of local contexts in how communities perceive and respond to climate change. Factors such as geography, natural resources and local lifestyles can influence people's sensitivity to climate change and their ability to cope with it. These results highlight the need to adopt a differentiated approach in the formulation of climate policies and strategies, considering local and regional realities. Increased awareness and education on climate issues are also essential to strengthen the resilience of communities in the face of growing climate challenges. Furthermore, these data highlight the importance of continuing research and data collection at the local level to better understand the dynamics of climate change and inform future actions.

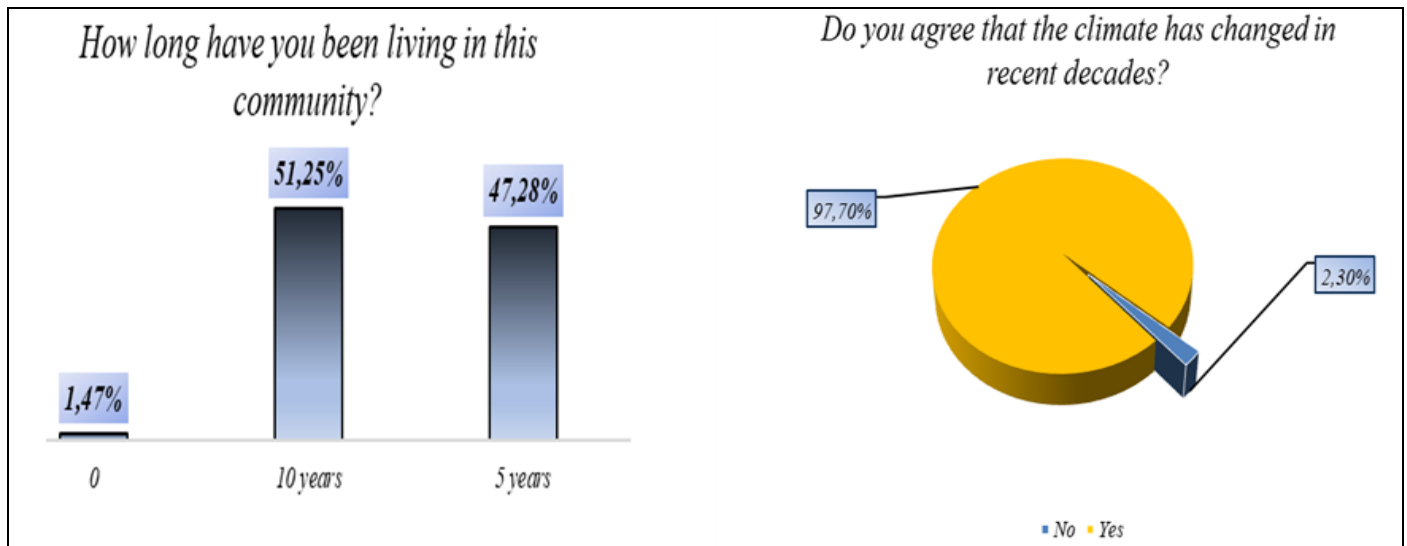


Fig 2 Analysis of Local Perceptions on Climate Change

➤ *Factors Perceived to Contribute to Climate Change*

Data on factors perceived to contribute to climate change reveal significant trends depending on how long residents have been in their community. Among those with more than 5 years of seniority, 21% mention precipitation (rainfall) as a major factor, while 23% cite temperature. However, the most widely recognized factor is land change, including deforestation and land use, with a high percentage of 55%. This distribution of responses highlights the impact of long-term experience and observation on the perception of factors contributing to climate change. Older residents in their community have likely witnessed environmental and climate change over the years, making them more aware of these issues. It is crucial to consider individual perspectives and local experiences for a thorough understanding of climate issues. Thus, an inclusive approach, integrating diverse perceptions and knowledge, is essential in the development of effective climate change adaptation and mitigation strategies. This is of particular importance for the management of natural resources and the preservation of the environment.

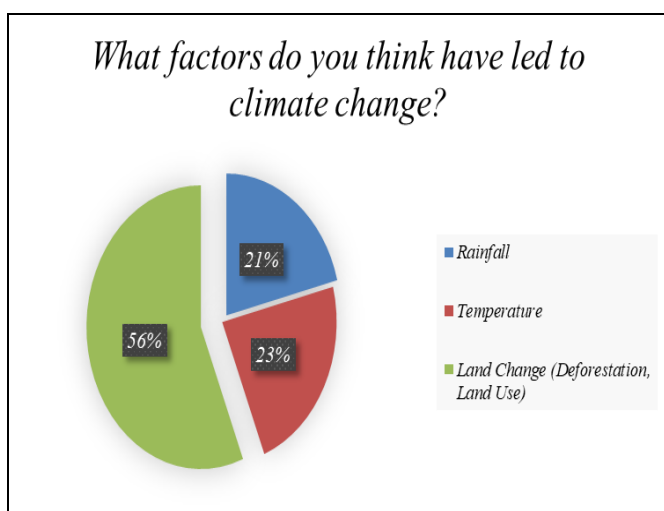


Fig 3 Factors Perceived to Contribute to Climate Change

B. *Experiences and Impacts of Climate Disasters*

➤ *Frequency and Severity of Climatic Disasters (Floods, Droughts, Violent Winds)*

Droughts are a major concern for many communities across Togo, as our study results highlight. These data reveal significant regional variations in the frequency of these climatic events. For example, in the Maritime region, almost half of the participants (46%) report two droughts per year, highlighting frequent exposure to this climatic phenomenon. These high figures can be explained by the geography and rainfall pattern of the region, which has significant implications for the availability of water resources and the livelihoods of local people. In contrast, in the Plateaux region, 39% of respondents report experiencing three to four droughts per year, raising major concerns about food security and economic stability. It is also interesting to note that 7% of participants said they had never experienced a drought, which may reflect micro-climatic variations or differentiated land management practices. Our study also reveals widespread concern about violent winds in several regions of Togo. The Kara region particularly stands out, with 37% of participants reporting an annual occurrence of strong winds. This high frequency raises concerns about the potential impact on infrastructure, the safety of residents and local economic activities. Furthermore, in the Plateaux region, nearly 39% of respondents face three to four episodes of violent winds per year, highlighting the urgency of appropriate adaptation measures. These figures also reveal regional disparities, notably in the Grand Lomé region, where almost a third of participants report an annual occurrence, probably attributable to the urban density and geographical configuration of the region. It should be noted that 10.01% of participants reported having never experienced strong winds, which may reflect pockets of resilience or microclimatic variations. Nevertheless, these results highlight the importance of preparing for extreme weather events, even in less affected areas. Regarding the perception and experience of heat waves across the Savanna region, 42% of participants reported two heat episodes per year, illustrating more frequent exposure to these extreme weather conditions. On

the other hand, in the Maritime region, only 7% of respondents report such a frequency, which reflects geographical variations in the impact of heat waves. In addition to frequency, it is also relevant to examine community perceptions of the intensity and duration of heat spells. The data reveals nuances in responses, with some participants reporting never experiencing heat waves, while others reporting regular exposure. As for epidemics, the regions present different pro-files. In the Plateaux region, nearly 39% of participants report a frequency of more than four episodes per year, while in the Maritime region, only 4% say they have never experienced epidemics. These variations reflect the health and environmental realities specific to each region, thus highlighting the importance of an adapted and differentiated approach in the management of epidemic risks.

The frequency of epidemics, including those of malaria, cholera and diarrhea, has significant implications for public health and community well-being. Recurrent episodes can overwhelm local health systems, compromising access to care and exacerbating pre-existing vulnerabilities. Therefore, it is imperative to strengthen epidemiological surveillance and emergency preparedness capacities in all regions of the country. These results also highlight the need for region-specific adaptation policies and measures to build resilience to climate epidemics. An integrated approach, involving close coordination between health authorities, humanitarian organizations and local communities, is essential to mitigate the impacts of epidemics and protect the health of Togolese populations.

Table 1 Analysis of the Frequency of Climate Disasters

Frequencies	Centrale	Grand Lomé	Kara	Maritime	Plateaux	Savanes	Overall average
How common are droughts in your community?							
Two 02 times a year	29%	29%	35%	46%	33%	40%	35%
Once 01 time per year	33%	12%	40%	25%	15%	19%	34%
Three to a quarter 04 times a year	20%	12%	17%	14%	39%	31%	20%
Never experienced drought	16%	44%	3%	14%	6%	3%	7%
More than quarter 04 times a year	2%	2%	6%	0%	6%	7%	5%
How common are high winds in your community?							
Once 01 time per year	9%	29%	37%	21%	18%	13%	32%
Two 02 times a year	22%	7%	24%	29%	18%	26%	23%
Three to a quarter 04 times a year	29%	10%	18%	18%	30%	39%	21%
More than 04 times a year	36%	15%	10%	11%	21%	17%	13%
Never experienced strong winds	4%	20%	10%	14%	12%	6%	11%
How common are heatwaves in your community?							
Two 02 times a year	16%	10%	29%	25%	24%	43%	28%
Never experienced heat waves	16%	12%	0%	7%	12%	6%	4%
More than quarter 04 times a year	13%	41%	13%	32%	27%	14%	16%
Three to a quarter 04 times a year	27%	7%	23%	29%	18%	23%	23%
Once 01 time per year	29%	29%	35%	7%	18%	14%	30%

➤ *Assessment of Human, Material and Environmental Damage*

As part of the assessment of human, material and environmental damage caused by climatic phenomena, the data collected offers an overview of the impacts in different regions of Togo. First, it is important to note that 72% of the participants reported that there were injuries during the occurrence of these previous climatic phenomena, while 28% reported the absence of injuries in their area. These figures highlight the extent of the damage caused to the health and safety of populations affected by climate disasters. Regarding the approximate number of people injured, the data indicates a variable distribution. Most of the respondents (64%) reported that the number of injured was around 10 people, followed by 17% of the participants who reported around 20 injured. Lower proportions were reported for higher numbers of injuries, with 7% for around 50 injuries, 6% for around 100 injuries, 1% for around 500 injuries, and 2% for more 500 injured. These data reflect the diversity of situations encountered during climatic disasters, with varying consequences on the number of injured. In the regional

analysis of human damage, significant disparities emerge, highlighting specific regional realities to be taken into account in disaster mitigation and response strategies. In the Kara region, for example, the results indicate a high rate of injuries when these phenomena occur, with 82% of participants reporting injuries. Additionally, 57% of respondents said there had been deaths, highlighting the significant challenges facing this region in terms of security and resilience to climate disasters. In contrast, in the Grand Lomé region, although 46% of participants reported injuries, the percentage of deaths is lower, with 40% of respondents reporting that there had been deaths. These data suggest differences in the severity of impacts and response capacity between regions of the country. In the Maritime region, the results also show a significant proportion of injuries (42%) and deaths (37%) during the occurrence of climatic phenomena. This highlights the particular challenges facing this densely populated region in terms of managing risks and protecting vulnerable populations. In more rural areas such as Savanna, although the absolute number of casualties may be lower, the proportion of people affected may be large relative

to the local population. In this region, 45% of respondents reported injuries and 38% reported deaths, thus highlighting the significant impact of climatic phenomena on rural communities. These data highlight the need for a differentiated and regionalized approach in the planning and implementation of climate risk adaptation and mitigation measures. Policies and interventions must be adapted to the specific realities of each region, taking into account local capacities, vulnerabilities and sustainable development priorities.

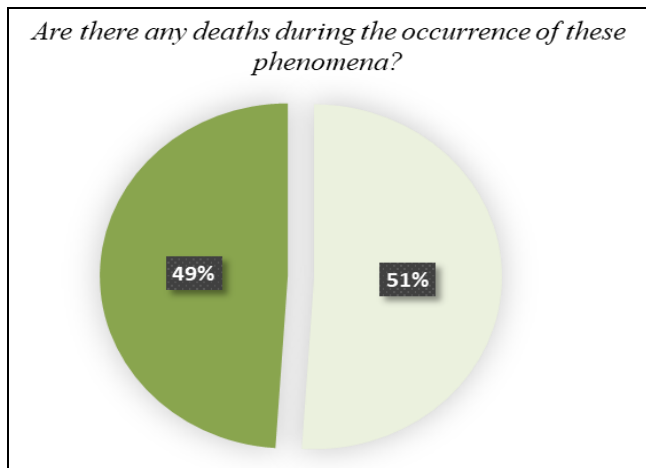


Fig 4 Analysis of the Occurrence of Deaths Linked to the Climatic Phenomenon

C. Community Disaster Risk Management

➤ Roles of Institutions and Risk Prevention and Mitigation Measures

Community-based disaster risk management is crucial to strengthening the resilience of populations to climate hazards. Local institutions play a vital role in implementing strategies and policies to mitigate the impacts of extreme climate events. The results of the questionnaire sent to the competent authorities reveal several strategic and policy measures under development or already in place.

• Strategies:

- ✓ Construction of dams: The construction of dams, reported by 100% of authorities, is a widely adopted preventive measure to regulate water flows and minimize the risk of flooding in sensitive areas.
- ✓ Early warning system: An early warning system is also widely in place, essential to quickly inform communities of imminent threats and enable rapid evacuation and adequate preparation.
- ✓ Training of health personnel: Mentioned by 63% of respondents, the training of health personnel is crucial to ensure an effective response to medical emergencies during climate disasters.
- ✓ Construction of sanitary evacuation infrastructures: At 50% mentioned by the authorities, the construction of sanitary evacuation infrastructures contributes to

guaranteeing adequate hygienic conditions in areas affected by floods and other extreme weather events.

- ✓ Community awareness and training: These initiatives strengthen the preparation and resilience of local populations in the face of climate threats.
- ✓ Provision of equipment and supplies: The provision of mats, clothing, mosquito nets and water reserves aims to meet the immediate needs of victims and prevent health risks after a disaster.
- ✓ Introduction of new breeds of drought-resistant species: This strategy aims to strengthen food security in areas affected by drought.
- Policies
- ✓ Awareness raising during the rainy season: An awareness policy during the rainy season, adopted at 88%, informs populations on the preventive measures to take to reduce the risk of disaster.
- ✓ Construction of adapted housing and shelters: The construction of adapted housing and shelters provides a safe refuge to vulnerable communities during extreme climatic events.
- ✓ Development of a national plan to combat coastal erosion: This plan aims to protect coastal areas against the harmful effects of erosion and marine submersion.
- ✓ Development of strategies for technology transfer: The development of strategies to accelerate technology transfer makes it possible to integrate technological innovations into disaster risk management practices.
- ✓ Capacity building of stakeholders: Capacity building of stakeholders, particularly in reliable data management systems, to improve the collection, analysis and dissemination of relevant information for decision-making.

These strategies and policies demonstrate the commitment of local institutions to prevent and mitigate climate risks, while strengthening the resilience of communities in the face of growing environmental challenges. Effective implementation of these measures requires close coordination between local authorities, community stakeholders and development partners, with the aim of guaranteeing the security and well-being of populations in a context of climate change.

➤ Effectiveness of Early Warning and Relief Mechanisms

The data provided reveals significant variations in the perception of climate risk management across different regions of the country. In the central region, for example, 38% of respondents rate risk management as satisfactory, while 58% rate it as poor. This disparity in opinions may reflect different experiences of climate events and responses from local authorities. In other regions, opinions also vary on

climate risk management. In the Maritime region, only 14% of respondents believe that risk management is satisfactory, while 78% rate it as poor. This perception can be attributed to the specific geographic and climatic characteristics of the region, as well as the perceived effectiveness of measures taken by local authorities to address climate risks. In the Plateaux region, the results show a similar trend, with 21% of respondents considering risk management satisfactory, while 79% rated it poor. Geography and environmental challenges in this region may influence residents' perceptions of the effectiveness of risk management measures. On the other hand, in the Savanes region, a significant majority of 50% of respondents believe that risk management is satisfactory, while only 21% consider it poor. This difference could be attributed to successful local initiatives in preventing and responding to climate risks, as well as better coordination

between authorities and communities. Similarly, when it comes to assessing the effectiveness of surveillance and early warning mechanisms, results vary from region to region. The Savane region stands out with 45% of participants considering these mechanisms to be effective. However, in the Maritime and Plateaux regions, a significant proportion of respondents consider them ineffective. These divergences highlight the importance of an in-depth analysis of climate risk management mechanisms and early warning systems at the national level. To improve risk management, it may be necessary to strengthen local capacities, improve coordination between institutions and communities, and establish more effective warning systems accessible to all. In addition, it is crucial to actively involve local populations in the planning and implementation of measures to prevent and adapt to climate change.

Table 2 Perceptions by Region of Climate Risk Management

Insight	What do you think about risk management in your country?					
	Centrale	Grand Lomé	Kara	Maritime	Plateaux	Savanes
GOOD	38%	37%	19%	14%	21%	50%
Excellent	0%	0%	2%	4%	0%	0%
Poor	58%	63%	76%	79%	79%	36%
Very good	4%	0%	3%	4%	0%	14%
Grand total	100%	100%	100%	100%	100%	100%

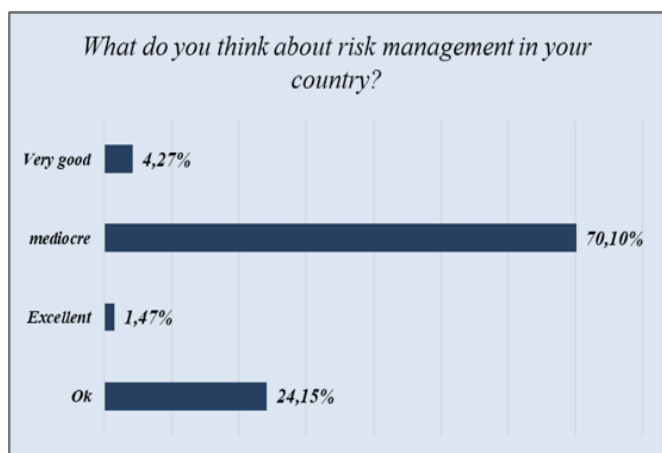


Fig 5 Analysis of the Perception of Climate Risk Management in the Country

V. PERSPECTIVES AND RECOMMENDATIONS

The in-depth assessment of climate risks across the different regions of Togo has brought to light significant data on human, material and environmental impacts. Building on these results, this section offers a crucial leveraging to guide future actions and strengthen the resilience of communities in the face of climate challenges. The recommendations below arise from lessons learned from the data analysis throughout this article.

➤ *Strengthening Climate Risk Management Capacities*
 Implement targeted training programs for local authorities, health professionals and communities, to improve their understanding of climate risks and promote best management practices.

➤ *Improvement of Early Warning and Surveillance Systems*
 Invest in innovative technologies and resilient infrastructure to strengthen early warning systems, ensuring increased responsiveness to extreme weather events.

➤ *Development of Climate Adapted Policies*
 Develop and implement national and regional climate-adapted policies, integrating resilient construction standards, sustainable urbanization plans and strategies for pre-serving fragile ecosystems.

➤ *Promotion of Multi-Sector Collaboration*
 Encourage collaboration between the public, private sectors and civil society for integrated management of climate risks, promoting the sharing of resources, knowledge and best practices.

➤ *Investment in Research and Innovation*
 Allocate resources to scientific research and technological innovation, enabling in-depth understanding of climate trends, forecasting emerging risks and developing tailored solutions.

➤ *Strengthening Coordination and Emergency Response Mechanisms*
 Establish robust emergency coordination and response mechanisms, ensuring rapid mobilization of resources and appropriate assistance to affected populations during climate disasters.

➤ *Promoting Community Resilience*
 Encourage community resilience initiatives, including diversification of livelihoods, conservation of natural

resources and strengthening solidarity networks within vulnerable communities.

This series of recommendations aims to guide future actions, thus contributing to strengthening the resilience of Togolese communities in the face of climate challenges, while promoting long-term sustainable and inclusive development.

VI. CONCLUSION

To sunup, the analysis of data relating to climate risks in Togo highlights the urgency of concerted action to mitigate harmful impacts on populations, infrastructure and ecosystems. The results obtained reveal significant diversity in the experiences and perceptions of communities across different regions of the country. Faced with these challenges, it is imperative to adopt a holistic and integrated approach to climate risk management, taking into account local realities, specific vulnerabilities and the adaptation capacities of populations. Collaboration between government actors, civil society, the private sector and international partners is essential to address these challenges effectively and sustainably. By implementing the recommendations set out in the previous section, Togo can strengthen its resilience to climate disasters, protect the lives and livelihoods of its citizens, and promote harmonious and sustainable development for future generations. However, the success of these efforts will depend on the continued engagement of stakeholders, the adequate allocation of resources, the integration of climate considerations into policies and development plans, as well as the collective will to create a safer and more sustainable future for all.

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