Int.J.Curr.Res.Aca.Rev.2024; 12(12): 28-35

EXCELLENT PUBLISHERS

International Journal of Current Research and Academic Review

ISSN: 2347-3215 (Online) Volume 12 Number 12 (December-2024)

Journal homepage: http://www.ijcrar.com

doi: https://doi.org/10.20546/ijcrar.2024.1212.004

Climate Change and Indigenous Knowledge in the Kabyè Region (North Togo)

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Abstract

In Togo, the impacts of climate change are visible and have been demonstrated by numerous scientific studies since the 1970s. They primarily consist of rising temperatures, decreasing rainfall, violent winds, increased evaporation, and more. Producers are struggling to adapt to these changes, which undermine their understanding of climate and the laws of nature. The objective of this study is to identify the indigenous knowledge used by the populations of the Kabyè region to enhance resilience to climate change. A field survey was conducted to compile this indigenous knowledge in order to identify the most effective practices. The results of the study reveal a rich diversity of indigenous knowledge that could play a crucial role in adapting to the effects of climate change. These traditional knowledges, rooted in local experience, include innovative agricultural practices, strategies for managing natural resources, and water conservation techniques, all designed to strengthen community resilience in the face of changing climatic conditions. Data analysis indicates that applying this knowledge could not only mitigate the impacts of climate change but also promote sustainable agriculture and improve food security. By integrating these knowledges into adaptation policies and programs, it is possible to create more effective approaches tailored to local realities. Thus, this indigenous knowledge represents a valuable asset to help the populations of the Kabyè region navigate the challenges posed by climate change.

Article Info

Received: 19 October 2024
Accepted: 28 November 2024
Available Online: 20 December 2024

Keywords

Climate Change, Indigenous Knowledge, Kabyè Region.

Introduction

Climate change is a reality that has been manifesting globally for several decades. This phenomenon, well-documented by various research studies, has varied impacts depending on the regions of the world.

African countries, despite their minimal contribution to greenhouse gas emissions, suffer significant damage due to their increased vulnerability (IPCC, 2007; IPCC, 2013). In Togo, as in other West African countries, the effects of climate change are felt through rising temperatures, an increase in floods and droughts, poor rainfall distribution, and a shortening of the growing season. Indeed, the average temperature increase there ranges from 0.3 to over 1°C (P. Adjoussi, 2000; A. Badameli, 2017). Similarly, the analysis of annual rainfall reveals a downward trend since the 1970s and 1980s, followed by a slight increase since 1990 (Edjamé, 1992; Adéwi, 2012; Badameli, 2019, p. 112). These manifestations of climate change are variably felt by the populations and impact their activities. Given that agriculture is particularly sensitive to climatic conditions, farmers are the most affected by these new realities and

are becoming aware of the ongoing changes. They are therefore implementing adaptation measures based on their traditional knowledge.

The Kabyè region is one of the most vulnerable areas in Togo due to its location in a Sudanese tropical climate zone, characterized by a dry season lasting 6 to 7 months, as well as a high poverty rate (Lemou, 2014). The manifestations of climate change in this region lead to increased vulnerability among farmers. Consequently, a question arises: what indigenous knowledge enables the people of the Kabyè region to effectively cope with climate change? The objective of this study is to identify this local knowledge to enhance resilience against climate change. The Kabyè region is located between 0°5' and 1°25' East longitude and between 9°20' and 9°48' North latitude. It is situated in the Kozah prefecture, in the Kara region, in northern Togo (see figure 1). Comprising 15 cantons and 4 municipalities, it is primarily populated by the Kabyè people, but also includes groups such as Bassar, Tem, Moba, and Ewé, forming a cosmopolitan population from all regions of the country.

Data and Method

This study is primarily based on the results of field surveys and bibliographic research. Numerous previous studies have already documented the manifestations of climate change in the study area, which led us to focus our investigation on the perceptions of local populations**.**

Data Used

The data used include:

Demographic data, which served as the basis for determining the sample to be surveyed.

Bibliographic information, gathered from existing studies and literature, was also integrated to enrich the analysis and provide a contextual framework for the results.

This combination of primary data (field surveys) and secondary data (bibliographic sources) ensured a robust and comprehensive understanding of the subject matter.

Method Used

A field survey was conducted to collect the endogenous knowledge of farmers in the Kabyè region. The selection criteria for the respondents were to be a household head of at least 50 years of age, having lived in the locality for at least 30 years, and having agriculture as their main occupation. The number of people interviewed was determined using Schwartz's formula (1995):

$X = Z\alpha^2 \times PQ / I^2$, where:

- ✓ X = sample size;
- ✓ Zα = 1.96, the standard deviation corresponding to a risk α of 5%;
- ✓ P = n/N (where P = proportion of selected households relative to the total number of households in the Kabyè region);
- ✓ N = total number of households in the district;
- ✓ Zα = 1.96, corresponding to a 95% confidence level;
- ✓ P = number of households in the villages relative to the total number of village households in the study area.

In total, 360 people were surveyed.

The spatial distribution of the sample was carried out considering the rural nature of the target population, composed of agricultural producers. Thus, the number of individuals to be surveyed was distributed across the three rural communes of the Kabyè region, focusing on the two villages with the most rural characteristics (see Table 1).

The survey was prepared using the Sphinx ME software (questionnaire design, data processing, and analysis). The variable values were then transferred to Excel for the creation of charts.

Results and Discussion

The results of this research mainly concern the various perceptions of agricultural producers in the Kabyè region regarding the manifestations of climate change in their living environment and agricultural practices.

Manifestations of Climate Change in the Kabyè Region

All survey participants (100%) reported observing changes in the climatic parameters of their canton. How are these changes manifested according to the respondents? The answers are illustrated in Figure 2. All producers (100%) observe an increase in temperatures as well as a decrease in rainfall. The third manifestation observed is the shortening of the rainy season, followed

by the frequency and duration of droughts, and strong winds, reported respectively by 90%, 70%, and 20% of the producers.

Given that agriculture is their primary activity, it is not surprising that they focus on factors that directly influence agricultural production. Strong winds are rarely mentioned because they occur only sporadically, at the beginning and end of the rainy season, as well as at the onset of the dry season, lasting only a few days each year.

Traditionally, the transition from one season to another was marked by specific indicators. For the rainy season, the croaking of toads and the calls of certain birds were observed. During this period, a day of excessive heat signaled imminent rain; the sun was then referred to as *tew wisi***,** literally meaning "the sun of rain," a reference to the atmospheric state preceding rainfall. Starless nights were perceived as a sign of approaching rain, as clouds obscured the stars from view.

As for the dry season, it was marked by the flowering of certain species, including a tree called *maatèdu* in Kabyè, meaning "I do not green." This tree loses its leaves at the beginning of the rainy season, making it particularly suitable for agroforestry because it does not interfere with the growth of surrounding plants.

However, this traditional knowledge is now under threat and deserves to be reassessed to identify which elements can be preserved and which have become obsolete in the face of contemporary climate change challenges. Nevertheless, agricultural producers acknowledge the importance of science, emphasizing that significant differences exist between scientific and traditional knowledge, while affirming that these two forms of knowledge complement each other.

Endogenous Adaptation Measures

To cope with the manifestations of climate change they have observed over the past few decades, agricultural producers have implemented various adaptation practices. One of the main adaptations has been the change in planting and harvesting dates to align with the new agricultural calendar resulting from these climatic changes. The rainy seasons, once predictable, have shifted, with a late start and an early end (Adewi, 2010; Badameli, 2019).

Additionally, the construction of stone bunds has proven effective in conserving moisture and preventing soil erosion on sloped land. Also known as terracing, these structures involve stacking stones perpendicular to the contours of the land, reducing soil and moisture loss for crops. This practice, used since ancient times by the Kabyè people in a region of multi-sloping plateaus, even gave the group its name (Kabyè literally meaning "stone gatherer"). However, this technique has been declining with the increasing occupation of flat areas.

Soil fertilization with animal manure mixed with plant residues is a traditional method in the Kabyè region, often practiced in conjunction with livestock farming. The animals are tethered above a compost pit filled with plant residues, allowing their droppings to decompose these materials. After several months, the compost formed at the bottom of the pit is extracted and spread on the fields before plowing and after sowing.

In addition to these traditional measures, the survey highlighted other practices adopted by the producers. The various measures identified by the surveyed producers are presented in Figure 3.

The measures adopted by agricultural producers primarily include the abandonment of millet cultivation, the reduction in the use of organic fertilizers in favor of pesticides and chemical fertilizers, the adoption of short-cycle seeds, and the prioritization of flatland cultivation over slopes, resulting in the gradual abandonment of terraces.

Millet, once a crucial food source to sustain farmers between harvests, has seen a drastic decline. Bird attacks, combined with a reduction in producers of this crop, led to its gradual abandonment.

With the advent of chemical fertilizers and pesticides, producers quickly adopted these products to simplify fieldwork and increase yields. However, the long-term harmful effects of these substances highlight that this method is not sustainable. It is imperative to prioritize the production and use of organic fertilizers, which not only nourish the plants but also contribute to soil regeneration.

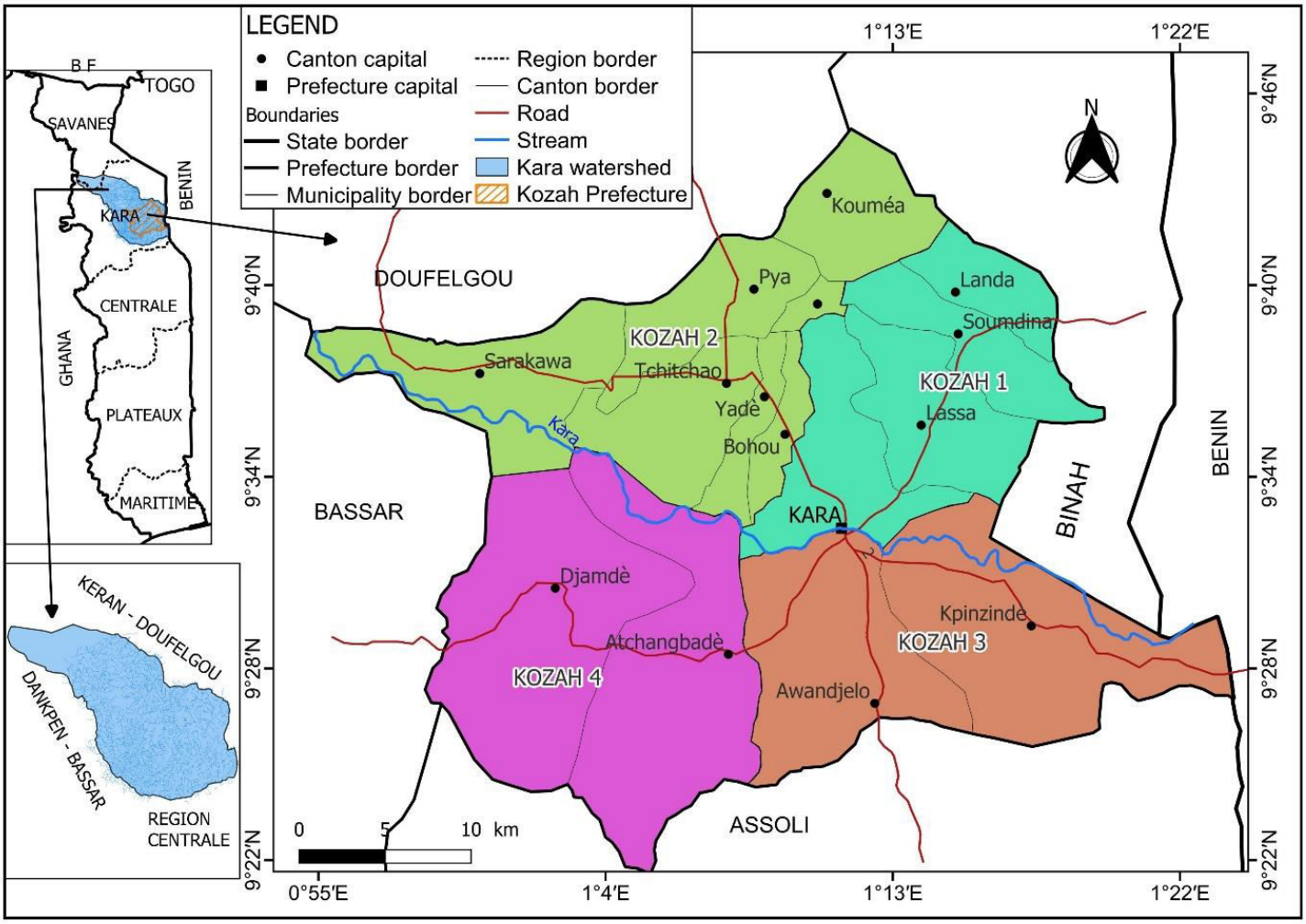
To adapt to shorter and more unpredictable rainy seasons, producers have now turned to short-cycle seeds. Crops with a cycle of two to three months are now the most commonly cultivated.

Table.1 Distribution of the surveyed sample according to the districts.

Communes	Cantons	Number of people surveyed
Kozah 2	Yadè	50
	Tchitchao	50
Kozah 3	Kpinzindè	50
	Awandjelo	50
Kozah 4	Atchangbadè	80
	Djamdè	80

Source: INSEED, 2022

Figure.1 Map of the Kabyè Region



Source: JICA Topographic Map

Figure.2 Manifestations of climate change according to agricultural producers in the Kabyè region

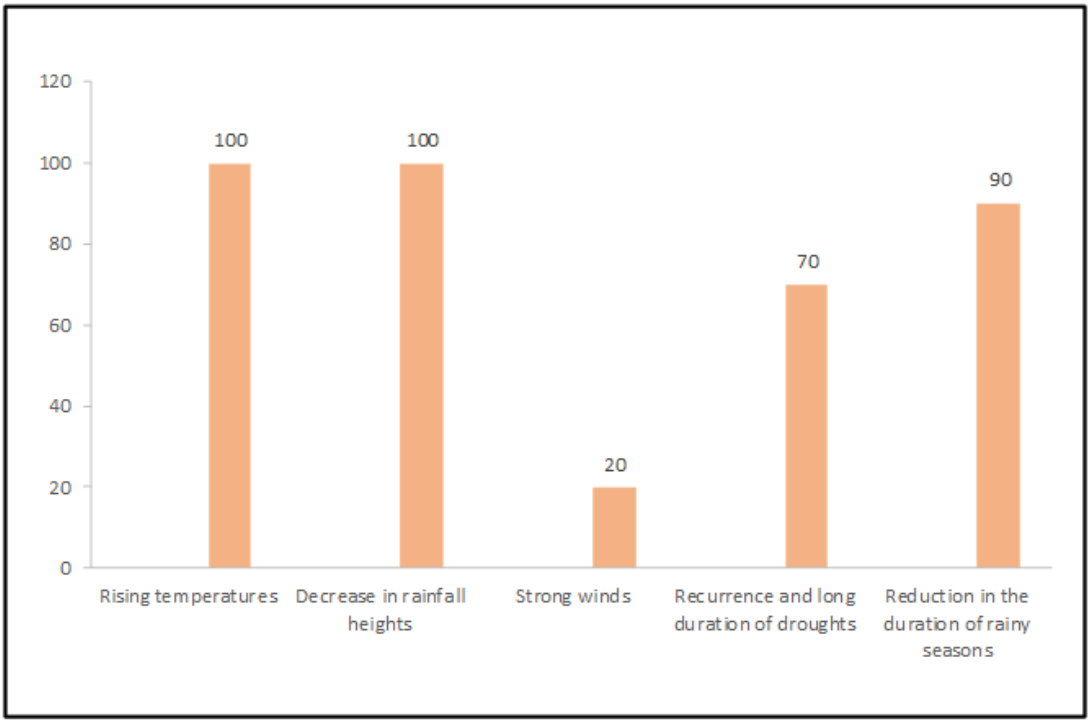


Figure.3 Adaptation measures adopted by agricultural producers in the Kabyè region

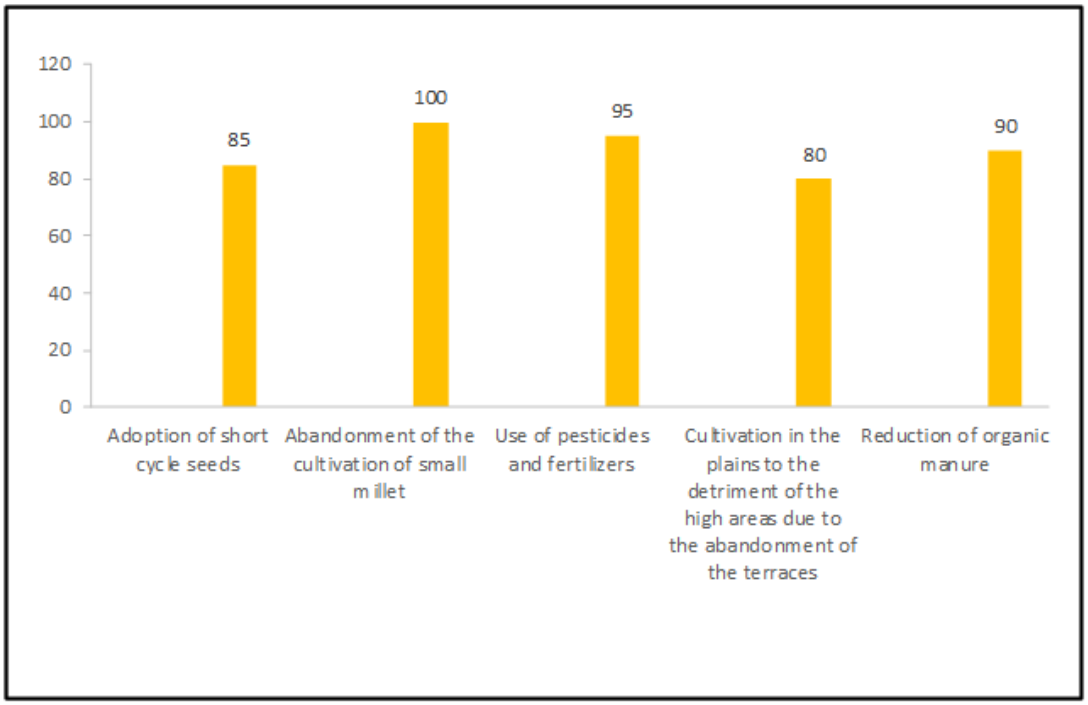
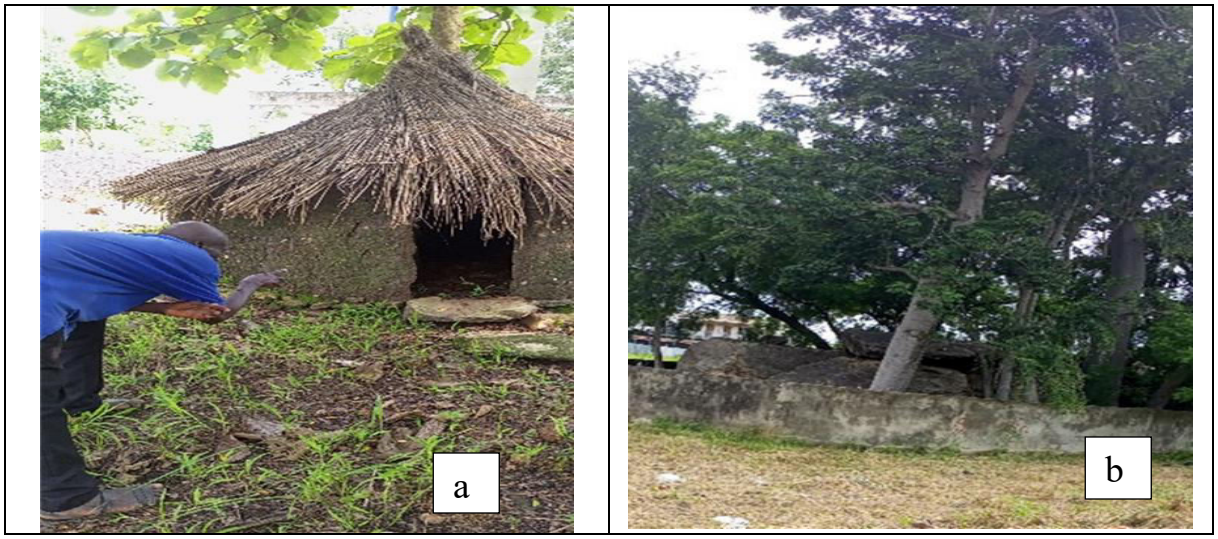


Plate.1 Locations of fetish ceremonies in the canton and in the former grand market Photographs: Mélila, July 2023



The ancestral technique of stone bunds, which gave the Kabyè people their name, is in decline due to the gradual migration of populations to the plains below the Kabyè massif. In these flatland areas, the use of stone bunds is no longer necessary.

Regarding perceptions of the origin of climate change, the idea of divine punishment for humanity's wrongdoings often arises, illustrating the link between the natural and the religious in traditional thinking.

However, several limitations hinder the application of traditional knowledge in the face of ongoing changes. Young people show reluctance to continue these practices due to the sacrifices required (such as abstaining from certain foods and sexual relations at specific times). Additionally, the influence of imported religions challenges some religious practices, and demographic growth has led to an incompatibility between traditional farming methods (fallow land, manual labor, sole use of organic fertilizer, terracing).

In response to the effects of climate change, some collective actions are emerging among producers. Religiously, offering ceremonies to fetishes are organized to invoke rain during drought periods. These rituals are overseen by traditional leaders (chiefs) and priests of traditional religions (called Tchodjo in Kabyè).

Photo a illustrates the site of the fetish ceremony in the canton of Djamdè, while Photo b shows the ceremony site located at the former grand market of Kara, in the Ewaou neighborhood. When observing Plate 1, it is essential to emphasize that agricultural producers are organizing into cooperatives, an initiative supported by the state within the framework of the Planned Agricultural Zones (ZAP). They also participate in events such as the FOPAT (Forum of Togolese Farmers), where they can express their challenges and present their products.

All producers (100%) show a keen interest in learning new agricultural production techniques to adapt to climate change. They are also willing to share their knowledge with others if needed.

The manifestations of climate change observed in the Kabyè region are also present in other regions of Africa. According to producers, this phenomenon is primarily characterized by significant variations in rainfall and temperature (N'Drin *et al.,* 2019, p. 297).

Regarding rainfall, 24.38% of respondents report a decrease in rainfall, while 18.84% mention an early interruption of the rains. These phenomena are particularly concerning for producers in northern Benin (Gbaguidi *et al.,* 2015, pp. 2526-2527). To adapt to drought, producers implement various strategies, including cultivating resistant local varieties, saving seeds after sowing, and using short-cycle local varieties (Gbaguidi *et al.,* 2015, pp. 2526-2527; Badameli, 2017). Other measures, such as agroforestry, the establishment of live fences, the creation of grass strips, and organic amendment, have proven to be particularly resilient to the effects of climate change and are widely adopted in the Savanes region (Kankpenandja *et al.,* 2021, p. 547).

For many African peoples, climate variability is perceived as a divine action, a punishment inflicted on humanity for its violations of religious rules (Faye, C. A. T.; Sy, B. A., 2013, p. 200).

It is important to recognize that scholarly knowledge, developed in a scientific framework, depends on the accumulation of experiences. Similarly, vernacular knowledge is based on experiential contexts but differs from scientific knowledge in that it does not rely on a rigorous analytical approach (Collignon, 2005); (Cheikh, 2019, p. 15).

Conclusion

Climate change is an undeniable reality that impacts our current world. In response to this situation, adaptation emerges as the immediate and necessary solution. Vulnerable regions, such as the Kabyè region, must urgently implement coordinated solutions that combine endogenous knowledge with scientific approaches to ensure the sustainability of the strategies put in place.

For these strategies to be truly sustainable and effective, it is essential to integrate traditional knowledge and practices. This will not only strengthen their relevance but also ensure better acceptance by local communities.

Moreover, organizing discussion forums bringing together researchers, agricultural producers, and technicians would be crucial. These exchanges would facilitate the creation of coherent and viable practices, likely to be widely disseminated and adopted. By collaborating in a multidisciplinary manner, we can develop innovative solutions tailored to the challenges posed by climate change, while preserving cultural heritage and local knowledge.

References

AAWI Pawesitom, 2010: Ethnoclimatology as a new approach to the study of climatic and agricultural phenomena in Togo: The case of the Kabyè region. Doctoral Thesis in Geography, University of Lomé, 304 p.

ADEWI E., BADAMELI K.S.M. and DUBREUIL V., 2010: Evolution of potentially useful rainy seasons in Togo from 1950 to 2000, Climatology, Volume 7, Aix en Provence, pp: 89-107.

ADEWI Essotalani, 2012: Agricultural strategies for managing rainfall deterioration in Togo. Doctoral Thesis in Geography, University of Lomé, 319 p.

Adjoussi Pessiezoum, 2000: Global Climate Change: Evaluation of the Evolution of Climatic Parameters in Togo," Master's Thesis in Geography, University of Lomé, Lomé, 121 p.

Badameli Pyalo Atina, 2017: Climate Change in Togo and its Impacts on Agricultural Activities. Doctoral Thesis, University of Lomé, Lomé, 257 p.

Badameli Pyalo Atina, 2019: Dynamics of Agricultural Seasons in the Kara Region of Northern Togo. Scientific Review of the Masters in Regional Integration and Development (MIRD) of the Faculty of Letters, Arts and Humanities, University of Abomey-Calavi, Benin, pp. 98-115.

Cheikh, B A, 2019: What Role for Endogenous Knowledge in the Fight Against Climate Change? Alternative Imaginaries in the Estuary of the Senegal River. NAAJ. African Journal on Climate Change and Renewable Energy, 1(1), 13-31. DOI: 10.46711/naaj.2019.1.1.2

Edjame Kodjovi, 1992: Global Climate Change: The Case of Togo; Laboratory of Terrestrial Photogrammetry of Clouds; School of Sciences, University of Lomé, 12 p.

Faye Cheikh Ahmed Tidiane, SY Boubou Aldiouma, 2013: Peasant Perceptions of Rainfall Variability and Responses in the Mbadakhoune Rural Community, Senegal. Revue de Géographie de Lomé, No. 10, 7th year, 188-204.

Gbaguidi A. A., FAOUZIATH S., OROBIYI A., DANSI M., AKOUEGNINOU B. A. and DANSI A., 2015: Endogenous Knowledge and Peasant Perceptions of the Impact of Climate Change on the Production and Diversity of Cowpea (Vigna unguiculata (L.) Walp.) and Voandzou (Vigna subterranea (L) Verdc.) in Benin. Available online at http://www.ifg-dg.org Int. J. Biol. Chem. Sci. 9(5): 2520-2541, October 2015 ISSN 1997-342X (Online), ISSN 1991-8631 (Print) DOI: http://dx.doi.org/10.4314/ijbcs.v9i5.23

GIEC, 2007: Climate Change. Synthesis Report. 2007 Climate Change Assessment: Synthesis Report. 114 p.

GIEC, 2013: Climate Change: Facts, Trends and Implications for the Economic World, 5th Assessment Report, Working Group No. 1, Paris, 20 p.

Kankpenandja Laldja, LARE Konnegbéne, BADAMELI Atina, TCHABI Atti, Alfa-Sika Mande Seyf

Laye, TCHAGBELE Abasse, OURO BITASSE Eralakaza, KADOUZA Padabô, 2021: Resilience of Endogenous Soil Management Practices to Climate Change in the Savanes Region of Northern Togo in Ivorian Review of Geography of the Savanes / Special Issue_October 2021, ISSN 2521-2125, International Conference "Crossed Views on Territories in Crisis and Food Security in Sub-Saharan Africa," Pages 528-549

Lemou Faya, 2014: Climate Dynamics and Agricultural Production in the Kara Region, Northern Togo. Doctoral Thesis in Geography, University of Lomé, 305 p.

N'drin Owo Jean Arnaud, Konan-Waidhet Arthur Brice, Kienon-Kabore Timpoko Hélène, 2019: Analysis of the Determinants of Resilience to Climate Change Among Farmers in the Fresco Department, Côte d'Ivoire. European Scientific Journal, June 2019 edition, Vol. 15, No. 18, ISSN: 1857-7881 (Print) e - ISSN 1857-7431, Pages 288-314. DOI: 10.19044/esj.2019.v15n18p288 URL: http://dx.doi.org/10.19044/esj.2019.v15n18p288

How to cite this article:

Badameli Pyalo Atina. 2024. Climate Change and Indigenous Knowledge in the Kabyè Region (North Togo). *Int.J.Curr.Res.Aca.Rev.* 12(12), 28-35. doi: https://doi.org/10.20546/ijcrar.2024.1212.004