Journal of
Developing Country Studies
(JDCS)

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Journal of Developing Country Studies
ISSN 2520-5307 (online)
Vol.8, Issue 2, pp 74 -109, 2024

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Youth and Climate Change in Pastoralist Communities in the IGAD's Karamoja Cluster: The Case Study of Turkana County, Kenya

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Article History

Received 16th October 2024

Received in Revised Form 19th November 2024

Accepted 23rd December 2024

How to cite in APA format:

Tadeo, P. (2024). Youth and Climate Change in Pastoralist Communities in the IGAD's Karamoja Cluster: The Case Study of Turkana County, Kenya. *Journal of Developing Country Studies*, *8*(2), 74–109. https://doi.org/10.47604/jdcs.3135

Abstract

Purpose: This study explores the interaction between youth, climate change, and pastoralism in Turkana County, a climate change hotspot within the IGAD's Karamoja Cluster. The study primarily examines youth's knowledge of climate change, its impacts on their lives, and their involvement in climate action initiatives.

Methodology: The study utilizes a mixed-methods approach, combining quantitative data from semi-structured questionnaires with qualitative insights gathered from interviews and focus group discussions. Data collection was conducted in both rural and peri-urban areas in Turkana County, supplemented by a review of secondary information from governmental and non-governmental organizations involved in climate action.

Findings: The findings reveal a complex association between youth awareness of climate change, its direct impacts on their livelihoods, and their involvement in climate action. Many youths have superficial knowledge of climate issues, and there is, therefore, a critical need for enhanced education and capacity-building to deepen their understanding of climate change, local and national policies, and global climate processes and actions.

Unique Contribution to Theory, Practice, and Policy: The study is grounded on theoretical frameworks of Social-Ecological Theory and Capability Theory to guide the analysis of youth, climate change, and pastoralist livelihoods. This study makes significant contributions to both academic literature and policy development by providing nuanced insights into the role of youth in climate action within the context of pastoralist communities. It underscores the importance of supporting youth-led initiatives and ensuring access to resources that will support them in promoting resilience in the face of climate change. The study's policy implications are particularly noteworthy, as it recommends integrating climate education into local curricula, prioritizing investment in youth-led climate action, and fostering collaboration among young people, local authorities, NGOs, and international organizations. By addressing the unique challenges faced by the youth in pastoralist settings, the findings aim to inform strategic interventions that improve community climate resilience and sustainable development. This study, therefore, advocates for the inclusion of youth perspectives in climate policy discussions, emphasizing their potential as critical change agents in promoting adaptive capacity and sustainable livelihoods within their communities.

Keywords: *Youth, Climate Change, Pastoralism, Turkana County, Karamoja Cluster, Resilience, Adaptation, IGAD, Climate Action*

Journal of Developing Country Studies
ISSN 2520-5307 (online)
Vol.8, Issue 2, pp 74 -109, 2024

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INTRODUCTION

Pastoralist communities in the Intergovernmental Authority on Development (IGAD) region, particularly in the Karamoja Cluster, are increasingly vulnerable to the impacts of climate change since their livelihoods and way of life are intrinsically linked to the natural environment (Mung'ong'o et al., 2019). This area, which includes Turkana County in Kenya, faces recurrent droughts, erratic rainfall patterns, and extreme temperatures. These climatic challenges significantly threaten the viability of pastoralism, which is the primary livelihood of these communities (Shibru et al., 2023). The reliance of pastoralists on livestock herding makes them particularly susceptible to environmental stressors, as their livelihoods are intricately linked to the availability of water and grazing land.

Youth is considered a populous, energetic workforce, warriors, entrepreneurs, innovators, and future leaders with increased literacy, awareness, information, confidence, sense of responsibility, authority, and modern technologies fit for resilient socio-economic development (Akrofi et al., 2019). Thus, engagement strategy influences the preparation of youth to be inspired, well-informed, empowered, responsible citizens and active drivers of changes relevant to enhancing the climate change agenda (Makondo & Thomas, 2018; Samaddar et al., 2021). Therefore, the relevance of youth to climate change entails any significant inclusion or participation of young people in processes that transform the present and future of socio-economic development in response to climate change (Zimba et al., 2021). Unfortunately, youth engagement in climate change adaptation and sustainable development in pastoralist communities has attracted limited research interest. Hence, the relevance of pastoralist youth in strategic interventions that promote low-carbon development pathways and climate resilience remains misaligned but compulsory. Defined in this study as individuals between 15 and 35 years old (African Union, 2019), youth represent a unique development stage in which they face diverse challenges and cascading influences (O'Brien et al., 2018).

Youth in the pastoralist communities in the IGAD's Karamoja Cluster are especially vulnerable to the impacts of climate change. They are disproportionately impacted by the effects of climate change in this region, not only environmental challenges but also socio-economic uncertainties that complicate their ability to adapt (Iyer, 2021; Michael, 2017; Mung'ong'o et al., 2019). With limited access to education, employment opportunities, and resources, young people in this region are at risk of marginalization, which can exacerbate their challenges. Bandura and Cherry (2019), Akrofi et al. (2019), and Barford et al. (2021) expounded on how exclusion and marginalization of youth would likely drive the severity of climate change impacts on youth. According to Morchain et al. (2015), Rao et al. (2019), and UNFCCC (2019), while the emerging research indicates that vulnerabilities to climate change impacts are gendered, policy approaches aimed at strengthening the adaptive capacities of the local communities largely fail to align with this reality. In general, the severity of climate change impacts would primarily be aggravated if pastoralist youths lacked relevant skills to leapfrog maladaptation and unsustainable development.

Turkana County bears the brunt of how cruel the environment can be: recurrent droughts, desertification, and protracted conflict over limited resources. These challenges have serious implications for pastoralist communities, who are exclusively dependent on natural resources for

their livelihoods. Climate change exacerbates these vulnerabilities as competition for scarce resources increases—compounding violence and displacement. The potential of young people in building sustainable, equitable, and resilient communities is also broadly acknowledged, but research on these specific vulnerabilities and contributions within these communities is often less well-explored. Investigating youth knowledge of climate change, its impacts on their lives, and their involvement in climate change adaptation and mitigation strategies in Turkana County is crucial for building resilience in pastoralist communities in the broader IGAD's Karamoja Cluster. Engagement strategies that inspire, empower, and equip youth to become active drivers of changes relevant to enhancing the climate change agenda are crucial for building resilience in pastoralist communities.

Statement of the Problem

Climate change relates to long-term alterations of weather patterns and environmental conditions due to increasing global surface temperatures attributed to anthropogenic sources (Intergovernmental Panel on Climate Change [IPCC], 2018; United Nations Framework Convention on Climate Change [UNFCCC], 2019). Climate change poses significant challenges to pastoralist communities in Arid and Semi-Arid regions, particularly in the IGAD's Karamoja Cluster, which includes Turkana County, Kenya. These communities, heavily reliant on livestock and natural resources, are increasingly vulnerable to the impacts of changing weather patterns, including prolonged droughts and erratic rainfall. Therefore, the ongoing climatic changes threaten the livelihoods of these poor and marginalized pastoralist communities (IPCC, 2019; UNFCCC, 2019). This is due to observed and predicted pressures that impair adaptive capacities and overreliance on natural resources (Sanson et al., 2019). Specifically, climate change is also linked with undesirable impacts on youth, a particular interest group of young people in transit to adulthood (United Nations Development Program [UNDP], 2016). Climate change's pressures on socioeconomic and sustainable development negatively impact young people (IPCC, 2021).

Narksompong and Limjirakan (2015), Enson (2019), and Akrofi et al. (2019) highlighted that youth currently dominate the world's population and are widely regarded as sensitive assets, energetic workforce, warriors, entrepreneurs, innovators, and future leaders equipped with increased literacy, awareness, confidence, sense of responsibility, authority and modern technologies that are fit for climate change adaptation and socioeconomic development. However, Simmons (2022) opined that youth are widely excluded in existing social systems. Nkrumah (2021), Gharabaghi and Nathe (2018), and Rao et al. (2019) argued that most youths, especially females, are already vulnerable to lifelong challenges linked to numerous human security concerns, including climate change, generational inequity, poverty, dependency, neglect, tokenism, and underrepresentation.

Despite the critical role of youth—who represent a substantial proportion of the population—in adapting to these changes, there is a lack of comprehensive understanding regarding their knowledge of climate change, the specific impacts they face, and their involvement in climate action initiatives. Current literature often overlooks the perspectives of youth in pastoralist settings, leading to a gap in understanding how climate change affects this demographic and how they can be effectively engaged in adaptation strategies. Furthermore, the traditional reliance on

elders and community leaders may limit youth agency and participation in decision-making processes, which is essential for fostering resilience in the face of climate challenges.

Without a thorough exploration of these issues, the potential of youth as critical agents of change in building community resilience to climate change remains largely untapped. Addressing this problem will inform youth engagements and significant strategic interventions that enhance locally-led adaptation, livelihood resilience, and sustainable development. This study, therefore, aims to fill these gaps by exploring the intersection of youth, climate change, and pastoralism in Turkana County as a case study to illustrate youth's broader challenges and opportunities with broader implications in such environments and across the IGAD's Karamoja Cluster. The study mainly examines youth knowledge of climate change, the impacts on their lives, and their involvement in climate action initiatives in this region.

LITERATURE REVIEW

Theoretical Review

This study is grounded in two interrelated theories: Social-Ecological Systems Theory and The Capability Approach.

Social-Ecological Systems (SES) Theory

As developed and formalized by Berkes and Folke (1998), the SES theory emphasizes the dynamic interconnections between human social systems and ecological environments. The concept of SES is based on the notion that 'the delineation between social and natural systems is artificial and arbitrary, emphasizing that people and nature are intertwined (Berkes & Folke, 1998). According to Folke et al. (2011) and Schoon and Van der Leeuw (2015), nature no longer merely sets the space where social interactions occur; likewise—people are not just external drivers in ecosystem dynamics. SES are, therefore, not merely social plus ecological systems but cohesive, integrated systems characterized by strong connections and feedback within and between social and ecological components that determine their overall dynamics (Folke et al., 2011; Biggs et al., 2021).

The SES framework is, therefore, relevant in relation to natural resource management, community resilience, and adaptive capacity. It acknowledges ecological changes, particularly those associated with climate change, not only as natural events but also as social processes that affect social structures, economic livelihoods, and cultural practices of vulnerable populations such as pastoralist communities. This study utilizes SES Theory to provide system-sensitive insights that can support a more holistic understanding of pastoralist responses to environmental change and variability. The existence of pastoralist communities depends largely upon the availability of natural resources, primarily pasture and water sources for their livestock. However, due to climate change, the aforementioned shared features of these communities have been altered, thereby exposing them to increased sensitivity and volatility due to erratic rain patterns, droughts, and resource scarcity. These changes directly jeopardize the livelihoods of pastoralists, primarily youth, who remain on the frontline of these changes. Understanding this complex interdependence between human social and ecological systems provides insights into how youth can play transformative roles in climate change adaptation.

Although the SES Theory is valuable in explaining the interdependence between social and ecological dynamics, it may be limited in addressing the socio-economic realities of pastoralist youth. For example, the theory tends to focus on how systems are resilient without sufficient attention to the agency of marginalized groups, particularly youth, and to issues of power relations that emerge in the allocation of resources and decision-making that affect them. Nonetheless, it is critical to address the barriers that limit youth empowerment and participation in robust community resilience in their areas. By utilizing the strengths of both social and ecological systems, we can create more sustainable and climatically resilient livelihoods in pastoralist communities.

The Capability Approach

The theory, rooted in the works of Sen (1974, 1974a, 1974b) and expounded by Nussbaum (2011a, 2011b, 2020), emphasizes the importance of individuals' abilities to act, adapt, and pursue their well-being. This framework focuses on empowering individuals by enhancing their capabilities rather than just addressing material conditions or economic outputs. At its core, the Capability Approach recognizes that individuals' well-being is not solely determined by their material wealth or access to resources (means) but by their ability to convert these resources (means) into meaningful and valuable functioning (Baldascino & Mosca, 2016). This theory encourages policymakers and researchers to shift their attention from a narrow focus on economic growth to a more holistic assessment of people's capabilities and the factors that enable or constrain their ability to live fulfilling lives (Baldascino & Mosca, 2016).

In the context of climate change, the Capability Approach highlights the need for resilience-building through access to knowledge and resources. In Turkana County, the impacts of climate change—such as increased droughts, resource scarcity, and fluctuating weather patterns—pose significant challenges to traditional pastoralist lifestyles. The application of this theory in this context allows for a nuanced understanding of how to empower youth to respond effectively to these challenges. It highlights the importance of empowering young people with ideas and tools to build resilience in the face of environmental challenges. By focusing on enhancing capabilities through education, resource access, and skill development, the youth can foster adaptive strategies that address the impacts of climate change.

Although the Capability Approach is useful for identifying and understanding individual and collective well-being, it is possibly too quotidian to engage with structural and systemic barriers that inhibit the agency of pastoralist youth. Therefore, addressing the barriers related to structural inequalities, cultural norms, and institutional support is essential for realizing the full potential of this approach. This necessitates integrative approaches that embrace the interplay of systemic inequalities, cultural dynamics, and environmental challenges in addressing the complexities of youth realities in pastoralist communities. In the long run, investing in the capabilities of youth has ripple effects that promote more sustainable and resilient communities.

Empirical Review

Youth and Climate Change: Global Perspectives

The intersection of youth and climate change has gained increasing attention in recent years, with various studies highlighting young people's unique vulnerabilities and capabilities in adapting to

climate challenges (Akrofi et al., 2019; Enson, 2019; Granderson, 2017; Makondo & Thomas, 2018; Narksompong & Sangchan, 2015). Research shows that youth are not just passive recipients of climate impacts; they actively engage in advocacy, innovation, and community action (Mackey et al., 2020; Makondo & Thomas, 2018; Samaddar et al., 2021). According to Lee et al. (2020), youth-led initiatives in urban areas have demonstrated significant potential in mobilizing communities towards sustainable practices.

Recent studies have explored the role of youth in agricultural and economic development in rural areas (Gasparri & Muñoz, 2019; Mapila, 2014; Wordofa et al., 2023). These findings suggest that young people living in rural communities have a vested interest in addressing climate change, as their livelihoods and futures are closely tied to the health of the environment (Gasparri & Muñoz, 2019). Moreover, youth-led initiatives in urban areas have demonstrated significant potential in mobilizing communities towards sustainable practices, indicating that similar approaches could be effective in pastoralist settings (Yee et al., 2021). However, there remains a limited focus on the pastoralist context, where the dynamics of youth engagement differ substantially.

Climate Change Impacts on Pastoralist Communities

Pastoralist communities, particularly in arid and semi-arid regions like Turkana County, face severe impacts from climate change, including increased frequency and intensity of droughts, shifts in rainfall patterns, and resource scarcity (Iyer, 2021; Michael, 2017; Mung'ong'o et al., 2019). These changes threaten traditional livelihoods and food security, exacerbating economic vulnerabilities and leading to social tensions within communities (Atsiaya et al., 2019; Basupi et al., 2019; Michael, 2017). The vulnerability of pastoral communities to climate change is higher due to the synergic effect of inadequate health services, insufficient infrastructure, poverty, lack of alternative means of income, limited public awareness of disease risks, and low literacy rates (Atsiaya et al., 2019). Pastoralist communities in Ethiopia, for example, face demographic trends, prolonged conflicts, reduced access to grazing land and water, erratic drought and climate change, food insecurity, and the impacts of livestock diseases (Bamlaku et al., 2015).

Compared to other demographics of older generations with some established roles and local knowledge, youth in pastoralist communities are particularly vulnerable to climate change, as they lack access to these adaptive resources, land, and decision-making processes (Akrofi et al., 2019; Bandura & Cherry, 2019; Barford et al., 2021). Climate-related disruptions—including droughts and resource scarcity—compound existing issues such as unemployment, lack of education, and limited livelihood opportunities for youth, driving them toward poverty, migration, or other high-risk survival strategies (Atsiaya et al., 2019). They are also left with the long-term consequences of environmental degradation and resource depletion, compounding their disadvantage. Resource-based diverging conflicts also render them vulnerable to risks of militia recruitment, thereby compromising their future. However, existing research often focuses on broader community impacts rather than disaggregating data to specifically address the experiences and perspectives of youth.

Journal of Developing Country Studies
ISSN 2520-5307 (online)
Vol.8, Issue 2, pp 74 -109, 2024

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Youth Knowledge of Climate Change

Understanding youth's knowledge of climate change is critical for effective engagement in adaptation strategies. Rao et al. (2019), IPCC (2018), and Mackey et al. (2020) underscored the relevance and urgent need for active youth engagement in low-carbon lifestyles and socioeconomic activities, arguing that this will significantly determine the future of humanity. Lee et al. (2020) corroborated further that observed and predicted climatic challenges create uncertainties, burdens, and anxieties that significantly disrupt young people's inherent abilities and interests.

Research suggests that while many youths are aware of climate change, their understanding is often superficial and based on personal observations rather than scientific education (Granderson, 2017; Myagmarsuren & Batkhuyag, 2021). In pastoralist contexts, traditional ecological knowledge can play a significant role in shaping their understanding (Granderson, 2017). However, few studies have systematically examined how youth in pastoralist communities acquire and interpret knowledge about climate change and its implications for their livelihoods.

Youth Involvement in Climate Action

Young people have a pivotal role in combating climate change. They are not only victims of climate change but also valuable contributors to climate action (United Nations [UN], n.d.). According to the World Economic Forum (2023), youth all over the world are becoming catalysts for change in the wake of the looming climate crisis and are raising their voices, spearheading climate initiatives for a sustainable future, calling for immediate climate action, and inspiring change through grassroots movements and worldwide campaigns. Despite the challenges they face, youth are increasingly engaging in climate action. Initiatives may include community-based projects, advocacy for sustainable practices, and participation in local governance (Yona et al., 2020). These actions are essential for building community resilience and promoting adaptive strategies. Amponsem et al. (2019) emphasized that excluded and irresponsible youth have higher chances of exacerbating the impacts of anthropogenic climate change on livelihoods due to maladaptation and unsustainable practices contrary to widely held expectations. However, barriers such as limited access to resources, lack of formal recognition, and cultural norms can hinder youth participation. (Yee et al., 2021).

The literature suggests that youth involvement in urban leadership development activities can serve as a basis for improving their condition, particularly in the context of economic development focused on the utilization of natural resources. According to Pesambili (2020), long-term experiences in agro-pastoral communities show that youth are expected to be the next generation of active warriors and significant workforces. In developing countries like Nigeria, the participation of young men and women between the ages of 13 and 30 can significantly contribute to local food security, but many choose to migrate to cities in search of better opportunities, posing a threat to global food security (Henning et al., 2022). While some research has documented youth-led initiatives in urban contexts, there is a notable scarcity of literature focused on their involvement in pastoral settings.

Research Gaps

1. **Limited Research on Youth Perspectives on Climate Change:** Much of the existing literature focuses on the impacts of climate change on pastoralist communities without adequately exploring youth perspectives. There is, therefore, a need for studies that examine youth perceptions and understandings of climate change and its impacts on their lives.
2. **Underexplored Sources of Youth Knowledge on Climate Change:** The existing studies have not sufficiently explored the sources of climate knowledge among youth from pastoralist communities. Understanding the ways and places that youth obtain information about climate change can inform educational and better engagement strategies.
3. **Disaggregated Impact Analysis:** The existing research aggregates data at the community level without disaggregating impacts on youth. This lack of granularity fails to capture the specific challenges that young people experience, especially regarding economic opportunities and educational access.
4. **Barriers to Youth Engagement:** While some existing research has highlighted barriers to youth engagement in climate action, there is a need for more comprehensive studies that explore these obstacles within the specific cultural and social contexts of pastoralist communities.
5. **Assessing Youth-Led Climate Initiatives:** The youth-led climate initiatives remain comparatively few and far between in pastoralist settings, at least on a larger scale, and so empirical assessment to derive substantive conclusions is limited. Evaluation research is, therefore, required to investigate the effectiveness of these initiatives and the factors that contribute to their success or failures.

Conclusion

The literature review highlights the critical importance of understanding youth and climate change within the context of pastoralist communities in Turkana County, Kenya. While existing research has laid the groundwork for exploring this intersection, significant gaps remain that must be addressed. By focusing on the knowledge, impacts, and engagement of youth, this study aims to address the following research gaps established in the literature review herein – limited research on youth perspectives on climate change in pastoralist communities, unexplored knowledge sources of climate change information for the youth, disaggregated impact analysis of climate change on youth, and barriers to youth engagement on climate action. The study, therefore, contributes valuable insights to both the academic discourse and practical strategies for fostering youth agency in climate adaptation efforts in the context of pastoralist communities.

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METHODOLOGY

Description of the Research Site/Study Area

The study was conducted in Turkana County, located in the northwest of Kenya. As the largest county by land area, Turkana covers 71,597.8 square kilometers (State Department for Devolution, n.d.) and shares borders with Uganda, South Sudan, and Ethiopia (Turkana County Government [TCG], 2023). Internally, it borders West Pokot, Baringo, Samburu, and Marsabit counties. The county's administrative center is Lodwar Town, within the Turkana Central Sub-County. It is divided into 11 sub-counties and 30 wards (TCG, 2023), with a population of 926,976 as of the 2019 census, projected to reach over 1 million by 2027 (Kenya National Bureau of Statistics [KNBS], 2019a). The county's youth population is significant, comprising about 60% of the total, which underscores the need for targeted policies and programs addressing challenges in education, employment, and climate resilience (KNBS, 2019c).

Turkana's economy is primarily based on pastoralism, with common livestock such as goats, camels, and cattle, and fishing takes place in Lake Turkana. Most of the county's income (67%) comes from livestock, while 4% comes from crop farming and 3% from fish farming (TCG, 2018). Furthermore, about 25% of the county's population derives their livelihoods from agriculture (TCG, 2018). The county also benefits from energy sources, including hydroelectric power from the Turkwel Dam, as well as oil exploration and renewable energy resources like wind, solar, and geothermal. The Lamu-South Sudan-Ethiopia Transport (LAPSSET) Corridor passes through Turkana, offering opportunities for tourism and investment, especially in areas like Lake Turkana and Central Highland National Park.

Journal of Developing Country Studies
ISSN 2520-5307 (online)
Vol.8, Issue 2, pp 74 -109, 2024

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Source: Modified by the Researcher, 2024

Figure 1: The map of Turkana County, Kenya

Geographically, Turkana is characterized by low-lying plains, mountain ranges, and major rivers like the Turkwel and Kerio. Lake Turkana, located 369 meters above sea level, is a crucial feature of the county, while the terrain includes hills, plateaus, and gazetted forests (TCG, 2023). The region's climate is harsh, with hot and dry conditions, temperatures ranging from 20°C to 41°C (a mean of 30.5°C), and low annual rainfall varying between 52 mm and 480 mm (an average of 200 mm). The county is highly vulnerable to climate change, experiencing unpredictable and erratic patterns of rain, often resulting in brief but intense storms and flash floods, frequent droughts, and extreme weather events, which contribute to poverty, food insecurity, and stress on local ecosystems (National Drought Management Authority [NDMA], 2016; Wiesmann et al., 2016). The harsh climate, combined with erratic rainfall, exacerbates the challenges faced by the population, particularly in the context of a reliance on pastoralism livelihood.

Research Design

This study used a case study design and the mixed research approach suggested by Kothari (2019) to facilitate inclusion and in-depth perspectives from youth, youth groups, government officers (both county and national), and representatives from non-governmental organizations (NGOs). Carminati (2018) also supported the use of a mixed research design, arguing that it enhances the

validity of results. The approach allowed a deeper understanding of key variables by promoting inclusion and voices from a small sample of diverse respondents.

Furthermore, the triangulation strategy that involved the use of multiple methods during data collection merged and cross-checked the validity of specific findings from quantitative and qualitative approaches (Dawadi et al., 2021). This resulted in the holistic comprehension of cross-cutting youth-related perspectives on research questions while offsetting weaknesses and gaining strength associated with individual research approaches (Harrison et al., 2020). Pragmatically, the literature review revealed less application of mixed research design as a standalone option in similar contexts; hence, it was the preferred design (Kitasho et al., 2020; Barreda, 2018).

Sample Size and Sampling Methods

Leavy (2017) defined a sample as a subset of the entire population from which the researcher intends to obtain the required information to make inferences about the entire population. The sample size is arrived at through a sampling technique. Sample size usually depends on the level of precision, confidence level, and degree of variability in the measured attributes (Singh & Masuku, 2014). Kumar (2019) asserts that a sample representing 10% or more of the targeted population is adequate for reliable data analysis. This study selected a sample of 247 (35.3%) from the target population of 700 across the 14 villages. Consequently, the sample size in this study was large enough to permit analysis. Within the 14 selected villages, cluster sampling was utilized to select 140 youth participants (70 educated and 70 uneducated), aged between 15 and 35 years, with 10 participants chosen from each of the 14 villages. This technique was chosen because it is less time-consuming and less costly, and there was an incomplete list of all members of the population in the selected villages. In addition, purposive sampling was applied to select 37 key informants from government agencies, NGOs, and youth leaders (7 respondents) and 70 youth respondents for seven focus group discussions.

The sample size of 247 respondents was determined by calculating the target population of 700 with a 95% confidence level and an error margin of 0.05 using the following formula adapted from Kothari (2019):

$$\mathbf{n} = \frac{Z^2 \cdot N \cdot p \cdot (1-p)}{(N-1) \cdot e^2 + Z^2 \cdot p \cdot (1-p)}$$

Where:

n = Sample size is given at 187 respondents.

Z = Z-score, corresponding to the desired confidence level given at 1.96 for a 95% confidence level.

N = Total population size given at 700.

p = Estimated proportion of the population (e.g., the proportion of respondents expected to have a particular characteristic), which was unknown and given at 0.5 to maximize the sample size.

e = Margin of error given as 0.05 for a 5% margin of error.

Journal of Developing Country Studies
ISSN 2520-5307 (online)
Vol.8, Issue 2, pp 74 -109, 2024

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According to Singh and Masuku (2014), a sampling technique is a method adopted by a researcher to select an appropriate sample size from which the required data will be collected. A sample thus allows a researcher to infer information about a population based on the results from only a subset of the population. Sampling design enables a researcher to determine the sampling frame and the sample size. This study employed both probability and non-probability sampling techniques. 11 Sub-Counties, 30 wards, and 154 villages were targeted as the source of the target population for this study. The sampling frame for this study was 700 respondents, comprised of youth, key informants from the national government, county government, and NGOs drawn from 7 sub-counties, 14 wards, and 14 villages across Turkana County. Stratified random sampling was used to select 7 out of the 11 Sub-Counties in Turkana County, 14 wards from the 30 wards within the selected Sub-Counties, and 14 villages from the 14 selected wards. This method was preferred for this study because it overcomes the problem of over-representation or under-representation of sections of the sampling frame – educated youth, uneducated youth, male and female youth across the selected Sub-Counties, wards, and villages.

Table 1: Sample Size

Category of Respondents	Population Size	Sampling Ration	Sample Size
Youth Participants	600	0.35	210
Youth Leaders	25	0.28	7
Turkana County Government officials	25	0.40	10
Kenya National Government officials	25	0.40	10
Representatives from NGOs (national and international NGOs)	25	0.40	10
Total	**700**		**247**

Source: Researcher, 2024

Data Types and Sources

The data utilized were from both primary and secondary sources. Primary data consisted of useful information collected by the researcher directly and fresh from the field sources as proposed by Bell et al. (2018), Capsticka and Pidgeon (2014), and Harrison et al. (2020). The data included demographic variables such as age, gender, education levels, place of origin, occupations, perceptions, awareness levels, experiences, and contributions relevant to youth's knowledge, impacts of climate change on youth, and their involvement in climate change action (Tabuti et al., 2016).

Secondary data was collected from published and unpublished sources consulted at international, national, and local levels (Bell et al., 2018). The data included credible information from existing sources relevant to this study's objectives. Generally, all secondary data provided balanced guidance and background information on relevant variables under examination, as suggested by Kothari (2019), Harrison et al. (2020), and Bell et al. (2018).

Data Collection Methods

Primary data collection involved three distinct instruments: semi-structured questionnaires, focus group discussions, and key informant interviews. Semi-structured questionnaires were

administered to youth respondents (n=140) with questions pertinent to all three objectives of the study. A semi-structured questionnaire was preferred for this study because it allowed a mix of both qualitative and quantitative information targeted by this study. This triangulation, according to Sekaran and Bougie (2016), allows for cross-validation between data collected from key informants, thus improving the reliability of the findings.

Interview guides and checklists were used for focus group discussions and key informant interviews. Key informant interviews were conducted to saturation levels (Bell et al., 2018) involving participants (n=37). Seven focus group discussions were conducted in seven out of fourteen Sub-Counties selected in the study. Each focus group involved six youthful (age 15-35 years) discussants (n=70). The key informants comprised youth leaders (n=7), officials drawn from the NDMA, Assistant County Commissioners (ACCs), and Local Chiefs; and Turkana County Government ministries of Agriculture, Pastoral Economy, and Fisheries; Trade, Gender, and Youth Affairs; Tourism, Culture, Natural Resources, and Climate Change; Education, Sports, and Social Protection; Water Services; Ward Administrators; and officials from NGOs working in Turkana County. These respondents were selected because of their extensive and unique understanding of youth, climate change impacts on pastoralists, and climate change adaptation and mitigation initiatives and programs in Turkana County.

It is worth noting that before administering questionnaires, conducting interviews, and facilitating focus group discussions, the researcher and research assistants provided an overview of the study and sought respondents' consent for effective participation. With guaranteed confidentiality, all respondents were free to withdraw their participation in the study at any time (Harrison et al., 2020). Fortunately, all the target respondents agreed to participate in the research and answered all the questions posed through the research instruments. A previously prepared checklist with guiding questions and follow-up probes proved helpful during interviews to complement data from the focus group discussions.

Furthermore, the researcher collected secondary data from the most recent and trustworthy academic literature, print media, and other relevant documents. Whenever available, secondary data sought from within the study area, as reported by various grassroots stakeholders, government ministries, departments, and agencies, received the highest priority. Secondary data gathered enlightened the study with relevant perspectives on youth in pastoralist communities, how the youth have been involved in climate action, challenges for youth involvement in climate change action, and opportunities for youth to contribute to climate change adaptation and mitigation.

Data Analysis

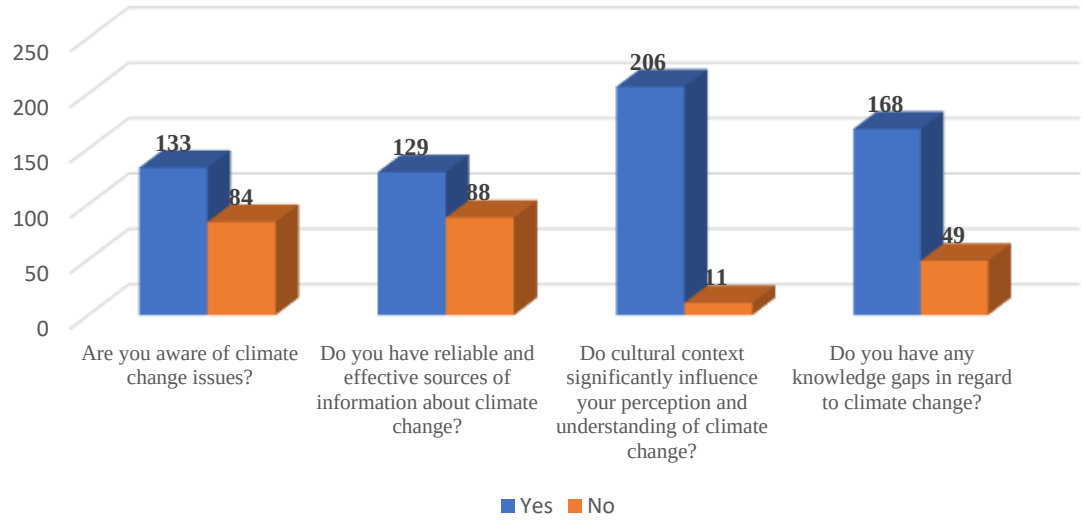
Since this study employed a mixed design, all collected qualitative and quantitative data received separate analyses, as suggested by Harrison et al. (2020). The thematic content analysis provided the researcher with data familiarity to identify and classify relevant patterns, codes, and themes. This analysis considered distinct steps that repeatedly moved back and forth to deduce the most relevant themes, as Kiger and Varpio (2020) recommended. As such, the role assumed by the researcher in the whole process maximised his interactions with data sets, codes, and themes to ease interpretations (Harrison et al., 2020). Since the semi-structured questionnaires gathered some quantitative data, the researcher used MS Excel to perform descriptive statistics analysis (Kitasho

et al., 2020; Capsticka & Pidgeon, 2014). Descriptive statistics provided a summary of primary data from the field to help analyse relationships between all pertinent variables in frequencies and percentages.

RESULTS AND DISCUSSION

Youth Knowledge of Climate Change in Turkana County

Figure 2: Summary of Youth Knowledge of Climate Change in Turkana County



Source: Field Data, 2024

The investigation into climate change awareness among the youth in Turkana County revealed significant insights into their understanding, sources of information, knowledge gaps, and cultural context.

Awareness Levels

When the respondents were asked to identify on a scale of 1 to 5 their awareness of climate change issues, the results are as follows: 0% marked 1 (not aware), 30.9% chose 2 (slightly aware), 26.7% selected 3 (moderately aware), 2.3% ticked 4 (very aware), and 1.4% selected 5 (extremely aware). In total, more than half of the respondents (61.3%) demonstrated a basic understanding of climate change, and all participants recognized changes in weather patterns as related to climate change, its impact, and some measures being taken to address it. However, the level of such awareness of climate change was based on indigenous knowledge and previous exposure to negative and cascading impacts associated with climate variability in the area. Furthermore, some respondents referred to isolated weather events rather than long-term trends, indicating a misunderstanding of the concept. This confusion between weather forecasts and climate change highlights a significant gap in foundational climate knowledge. There, is, therefore, the need to develop and implement

localized climate education curricula both in schools and villages that combine scientific knowledge with traditional ecological practices.

Educated youth engaged in this study tended to use more scientific terminologies when discussing climate change, with 42.9% of educated respondents aware of its general causes and impacts, compared to 31.4% of uneducated youth. However**,** despite this use of terminologies by educated youth, it did not necessarily correlate with a deeper understanding of the issues. Moreover, 41.3% of male respondents showed significant understanding, contrasted with just 25% of female respondents, indicating a gender disparity in climate knowledge. This disparity in understanding between genders raises questions about the accessibility of climate education for young women in this county. In order to address this gender disparity in climate knowledge, there is a greater need to intentionally implement initiatives that target young women by enhancing their access to climate education, vocational training, and leadership programs.

In terms of perceived causes of climate change, 91.2% of the youth respondents identified deforestation as the primary contributor, with only 6% and 2.3% attributing it to industrial pollution and livestock keeping, respectively. However**,** while most of the youth believed local practices like deforestation and charcoal burning were significant causes, many intertwined these beliefs with local narratives attributing climate change to supernatural forces – "all this is a punishment from God and the crude works of the seers and witch doctors in this area.," one respondent commented. Furthermore, while respondents acknowledge local practices as significant contributors, there is limited understanding of the broader systemic factors influencing climate change. This gap indicates a need for educational programs integrating local knowledge with the scientific understanding of climate change dynamics.

A strong link was identified by 89.4% of the respondents between climate change and increased droughts and extreme temperatures. A majority of the participants reported a solid association between climate change and resource-based conflicts, with 82.5% of the respondents connecting these conflicts to climate-induced migration exacerbated by depleted water sources and grazing lands for their livestock. 71.4% of the respondents also linked unpredictable rainfall and prolonged droughts to increased food insecurity due to the death of livestock and poor crop yields by farming households. However**,** despite this relative exemplary awareness, only 17.5% of the youth respondents were knowledgeable about county, national, and global efforts to address climate change, revealing a substantial gap in understanding broader climate policies, processes, and interventions. Additionally, only 13.2% of them exhibited some essence of global awareness of climate change causes or recognized the implications of international actions on local conditions, further underscoring the need for enhanced education and engagement in climate action initiatives in Turkana County.

Global climate policies like the Paris Agreement, the United Nations Framework Convention on Climate Change (UNFCCC), and the Sustainable Development Goals (SDGs) set frameworks for climate action, promoting emission reduction, resilience building, and funding for vulnerable regions. National policies such as Kenya's Climate Change Act and the National Climate Change Action Plan (NCCAP), alongside the Turkana County Climate Change Act and other climate resilience strategies, guide local adaptation and mitigation efforts. However, the lack of awareness

among youth in Turkana about these policies limits their ability to engage in global climate initiatives, access funding, and advocate for local needs. This disconnect perpetuates their marginalization and excludes them from climate decision-making processes that directly affect their communities. This, therefore, indicates a need for initiatives that link local youth with national and international climate action, enhancing their understanding and engagement in these processes. Workshops and training programs should be conducted to familiarize youth with county, national, and global climate policies and frameworks, as well as their linkages and implications.

Sources of Information about Climate Change

Participants reported various sources for information about climate change, with 19.4% citing formal education in schools, 3.2% from newspapers, 3.7% from television, a substantive 40.6% referring to social media (Facebook, WhatsApp groups, and Instagram), 13% identifying community meetings as critical venues for information dissemination, and 20.3% acknowledging awareness creation through workshops and training facilitated by government agencies and NGOs in their community. When asked to rank the reliability and effectiveness of these sources, 94.5% ranked social media as the most unreliable and ineffective of these channels. It is, therefore, essential to note that the effectiveness and reliability of all these sources vary significantly, with social media often conveying mixed messages and misinformation, which can lead to confusion, false alarms, and anxiety. This highlights the critical need for collaboration with trusted local institutions to disseminate accurate climate information through community meetings, schools, and workshops. Efforts should minimize youth reliance on unreliable sources like social media by providing alternative platforms such as interactive radio programs and localized digital campaigns.

Cultural Context

Culture plays a significant role in shaping young peoples' understanding of climate change. Traditional beliefs and practices influenced the way respondents interpreted environmental changes and assigned causes to climate phenomena, and this was recognized by nearly all respondents (95%). Local narratives often highlighted supernatural causes, which coexisted with scientific understandings. This cultural framework thus both inhibits and supports climate action; it can obscure scientific understanding but also offers pathways to align traditional knowledge with climate education. Educational programs that align scientific explanations with traditional beliefs can further deepen the engagement with cultural narratives and local practices while enhancing climate change messaging to ensure that they resonate with the local populace of Turkana County.

Key Knowledge Gaps

One of the significant knowledge gaps identified was the considerable lack of knowledge among the youth (82.5%) about county, national, and global actions on climate change, including policies and frameworks in place to mitigate the effects of climate change. Moreover, 81.5% of the respondents had little insight into the fundamental causes of climate change, which restricted their ability to participate in broader debates about climate. In addition, 76.5% had inadequate knowledge and skills on climate change adaptation and mitigation strategies and awareness of how their actions are related and linked to national and global efforts. 68.2% did not know if there were

any opportunities for them to work with the government, NGOs, and other youths in dealing with climate change impacts within their community.

The absence of these vital components of climate education indicates an urgent need for a systematic approach to educational programs that provide both local and global contexts and their effects to contribute to a deeper, nuanced understanding and informed engagement among the youth on climate issues in Turkana County. It is also important to establish and support youth-led networks focused on climate action within Turkana County. These networks could serve as platforms for collaboration, innovation, and sharing best practices while linking local youth to broader regional and global climate initiatives. Furthermore, there is a need to create and strengthen avenues for youth to work with government and NGOs on climate projects, such as internships, volunteer programs, or innovation hubs. These opportunities will enable them to apply knowledge practically and strengthen their role as change agents.

Impacts of Climate Change on Youth in Turkana County

This section explores the specific impacts of climate change on youth in Turkana County and their coping mechanisms in response to these challenges.

Impacts of Climate Change

When asked to rate the impacts of climate change on youth in their community using a scale of 1 to 5, the respondents provided the following results: 0% selected number 1: Not seriously (No noticeable impact on youth); 0 marked number 2: Slightly serious (Minor impacts that are not widespread); 18.9% ticked number 3: Moderately serious (noticeable impacts affecting some youth, but not all); 33.6% chose number 4: Very serious (significant impacts affecting many youths and their livelihoods); and, 47.5% selected number 5: Extremely serious (severe impacts that are threatening the well-being and future of youth in the community). Overall, although they selected different options, all the respondents reported that youth in Turkana County are profoundly affected by climate change, particularly through its effects on pastoral livelihoods. The respondents were then asked to identify the specific impacts of climate change experienced by the youth in Turkana County, with the results discussed herein:

Journal of Developing Country Studies
ISSN 2520-5307 (online)
Vol.8, Issue 2, pp 74 -109, 2024

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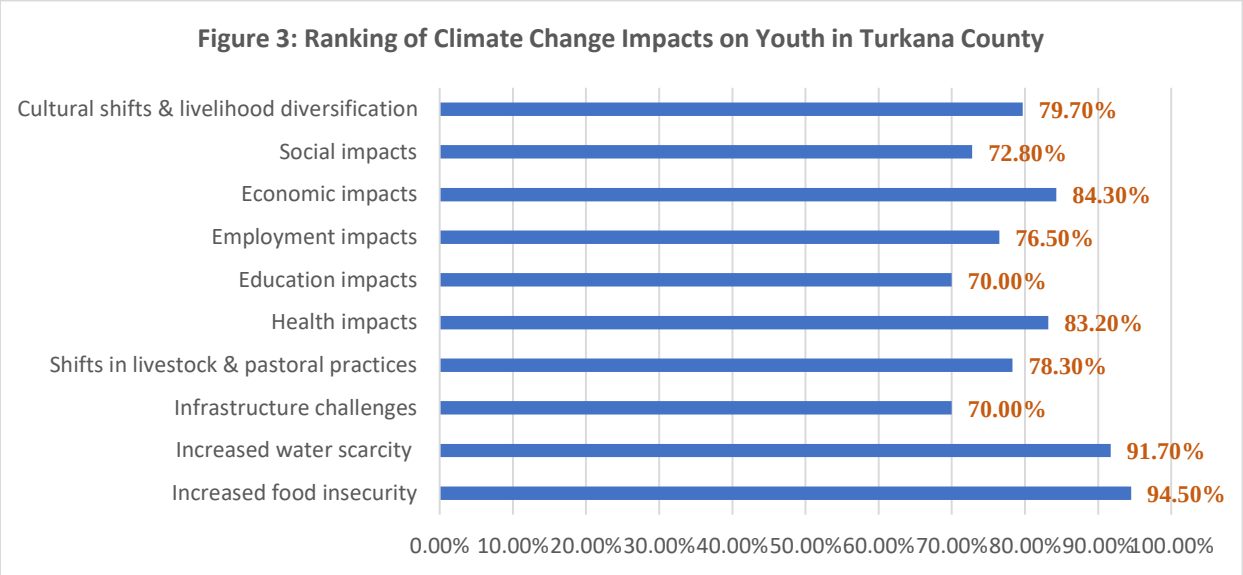

Source: Field Data, 2024

Increased food insecurity: Many young people face food insecurity due to climate change. A majority of the respondents, 94.5%, indicated that their area had experienced a significant reduction in livestock populations and poor crop yields, especially in the youth families, attributable to frequent drought and unpredictable rainfall, leading to substantial economic losses and increased food insecurity in the study area. In addition, with local food production decreasing, food has become expensive, making it challenging for youth and vulnerable households to afford essential, healthy, and nutritious food.

Increased Water Scarcity: 91.7% of the respondents agreed that the impact of climate change in Turkana County had reduced water sources. The Turkwel and Kerio Rivers are some of the major rivers that have potentially lost their flow or dried up, resulting in lasting water shortages for both people and livestock. This scarcity has intensified competition over limited water resources and heightened tensions within and across communities. As a result, the conflict over water has undermined social cohesion and peaceful co-existence, particularly along the borderlands of Turkana County, where resource-based conflicts among pastoralist communities are frequent.

Cultural shifts and livelihood diversification: 79.7% of the respondents indicated that youth families in Turkana County are increasingly changing their livelihood practices due to the impacts of climate change. According to one of the key informants from the NGO, traditional practices have become unsustainable, hence a gradual shift towards more diversified income sources, including small-scale trade, eco-system, boda-boda (motorcycle) business, fishing business, mechanics, and artifacts. A key informant from the Ministry of Tourism, Culture, Natural Resources, and Climate Change noted that there are now increased adaptations of traditional knowledge where youth and elders collaborate to blend traditional knowledge with modern livestock keeping, crop farming, and resource management techniques.

Journal of Developing Country Studies
ISSN 2520-5307 (online)
Vol.8, Issue 2, pp 74 -109, 2024

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Infrastructure challenges: 70% of the participants confirmed that increased frequency of extreme weather events, such as floods and storms, damaged roads and infrastructure, complicating access to markets and other critical services. A key informant from the Ministry of Trade, Gender, and Youth Affairs noted that "this has further exacerbated the vulnerabilities faced by marginalized communities in Turkana County, particularly the youth." The destruction of roads and markets limits people's mobility, preventing them from seeking economic opportunities, healthcare, or education. This is particularly concerning in a region already facing drought, food insecurity, and lack of basic services. An informant from the NDMA argued, "The cumulative effect of extreme weather events, coupled with limited infrastructure resilience, has led to greater poverty and higher levels of stress and anxiety among the youth and within the Turkana community."

Shifts in livestock and pastoral practices: A substantial 78.3% of the respondents reported that their families in Turkana County are now forced to migrate longer distances with their livestock in search of water and pasture. According to a key informant from the Ministry of Agriculture, Livestock Development and Fisheries:

> *This shift has disrupted traditional grazing patterns and increased migration, leading to intensified armed intra and inter-communal cross-border conflicts led by the youth, particularly between the Turkana community and the neighbouring pastoralist communities living along the international borderlands of Uganda, South, and Ethiopia...*

Health, education, economic, and social challenges: A total of 93.1% reported that young people and their families in Turkana County are at risk of increased infections attributable to malnutrition and water-related endemic diseases related to steep food prices, limited access to clean water, and poverty-induced poor hygiene practices. Additionally, 73.3 % of the respondents acknowledged that the stress of climate change adaptation stressors like loss of livelihoods and resources have increased anxiety and stress among the youth, which have resulted in psychological and mental health issues. 70% of the respondents noted that educational disruptions are also prevalent, as their families struggle to prioritize schooling amidst economic pressures, with many youths forced to drop out to support their households. Furthermore, 76.5% of respondents indicated that the compounded stress of these factors has worsened unemployment rates, especially among young men, who traditionally depend on pastoralism as a primary source of income. 84.3% reported that youth households today face economic losses and difficulties due to increasing unemployment rates caused by the impacts of climate change. Also, 72.8% of the respondents indicated that in young families in which young men are heads of households, there are increased incidences of gender-based violence, breakups, and divorces due to climate-induced stress factors and greater economic difficulties.

Coping Mechanisms and Strategies

When asked how the youth are coping with the adverse impacts of climate change in Turkana County, the respondents noted that they have resorted to some coping strategies, highlighting the complex interplay between climate-induced stress, socio-economic factors, and cultural dynamics within the community. Below is a discussion of the coping mechanisms identified by the respondents:

Journal of Developing Country Studies
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Road Banditry and Livestock Raids: Prolonged droughts, unpredictable rainfall patterns, and dwindling grazing land have intensified resource competition. In response, 71.4% of the participants reported that some youths in Turkana County have now turned to road banditry and livestock raids to acquire livestock, money, or food, which are crucial for economic survival. According to key informants from the government, while harmful to community security and stability, these illegal activities can be viewed as desperate measures driven by the dire lack of resources and the erosion of traditional livelihoods. Some key informants from NGOs argued that these forms of coping also reflect the weakening of law and order due to the breakdown of local economic systems, which have historically provided youth with more stable opportunities. According to an informant from the NDMA, while these activities may provide short-term material gains, they often lead to inter-communal violence, insecurity, and further social fragmentation. They undermine community cohesion and often result in the loss of lives and injuries, deepening the vulnerabilities that climate change has already imposed.

Charcoal Business: With increasing pressure on natural resources due to climate change, particularly the depletion of grazing land and water sources, 66.4% of the respondents noted that some youths have turned to the charcoal business as a coping mechanism. This involves cutting down trees for charcoal production, which offers an income stream when other livelihood options are diminishing. An informant from the Ministry of Tourism, Culture, Natural Resources, and Climate Change argued that "while this may provide short-term financial relief, it has significant long-term environmental consequences, contributing to deforestation, soil erosion, and further land degradation, which exacerbate the effects of climate change in the long term." A representative from an NGO argued that this coping strategy creates a vicious cycle where immediate economic survival undermines the natural environment on which future livelihoods depend. This highlights a tension between immediate economic survival and the need for sustainable resource management, creating a paradox where climate change mitigation efforts may be undermined by the very strategies people use to cope with its impacts.

Livestock Business: Despite the challenges posed by climate change, livestock remains central to the livelihoods of many youths in Turkana County. 71.4% of the respondents reported that the impact of climate change on livestock—such as drought-related deaths and reduced pasture—has forced some youth to adapt by engaging in the livestock business more actively. This may involve buying and selling livestock or diversifying into alternative livestock-related businesses (e.g., dairy, meat production, and animal trading). According to an informant from the Ministry of Trade, Gender, and Youth Affairs, the strategy reflects the resilience of youth to adapt within the constraints of their traditional livelihoods. However, an NGO representative argued that climate variability—such as droughts, flooding, and disease outbreaks—remains a significant risk, making the sustainability of this approach uncertain. The livestock business also exposes youth to price fluctuations and market volatility, compounded by climate-induced scarcity and uncertainty. While this strategy can provide economic resilience, it still depends heavily on shifting environmental conditions, which remain uncertain due to climate change.

Early Marriages for Young Girls: Early marriages among young girls in Turkana County have been identified as another coping mechanism linked to climate change. 79.7% of the respondents reported that, as droughts and resource scarcity increase, families marry off their daughters at a

young age, often to reduce the economic burden on the household or to secure bridewealth, which can offer financial support during difficult times. A key informant from the Ministry of Education, Sports, and Social Protection argued that for young girls, early marriage may seem like a way out of the harsh realities of climate-induced poverty. While it may seem like an immediate solution, early marriage has significant long-term negative impacts on young girls. According to an NGO informant, "This practice limits young girls' opportunities for education, economic independence, and personal development. It also increases the risks of early childbirth, health complications, and domestic violence, reinforcing cycles of poverty and gender inequality."

Migration to Urban Centers: 81.6% of the respondents reported that the increasing difficulty of sustaining a pastoral livelihood due to climate change has also led some youth to migrate to urban centers for alternative employment and better living conditions. One of the Ward Administrators pointed out, "The hope is that migration can offer new opportunities for the youth, such as employment in the informal sector or access to education and healthcare." It also allows youth to move away from the direct impacts of climate change on the pastoral economy and engage in wage labor or other non-agricultural work. However, it also poses challenges, as many urban areas are already overcrowded, and the demand for jobs, housing, and services exceeds supply.

According to a key informant from the Ministry of Trade, Gender and Youth Affairs:

> *The youth migrating from rural areas often face social exclusion, poor living conditions, and a lack of job security, making it difficult to escape poverty…Additionally, the migration process can strain the social fabric of rural communities, further disempowering youth left behind…*

Diversified Livelihoods: In response to the unpredictability of climate change, 86.1% of the respondents indicated that most youths had pursued diversified livelihoods that include various alternative income-generating activities such as small-scale agriculture, selling of clothes, fishing business, artisanal crafts, boda-boda (motorcycle) business, small-scale trade, and livestock business, reflecting a desire to diversify income sources beyond traditional pastoralism. A key informant from the Ministry of Agriculture, Livestock Development, and Fisheries emphasized that livelihood diversification is a proactive coping strategy that increases resilience to climate shocks. It reduces dependency on a single source of income and allows youth to adapt to changing conditions, whether through urban entrepreneurship or new agricultural practices suited to changing weather patterns. According to an NGO key informant:

> *While diversification offers greater financial security, these transitions are not without obstacles, as they require access to training, capital, and markets, which may not always be available. Moreover, youth often face barriers such as limited access to land, credit, and infrastructure…*

Youth Involvement in Climate Action in Turkana County

This section examines how youth are engaged in climate action, the motivations driving their involvement, and the barriers they face in their participation.

Journal of Developing Country Studies
ISSN 2520-5307 (online)
Vol.8, Issue 2, pp 74 -109, 2024

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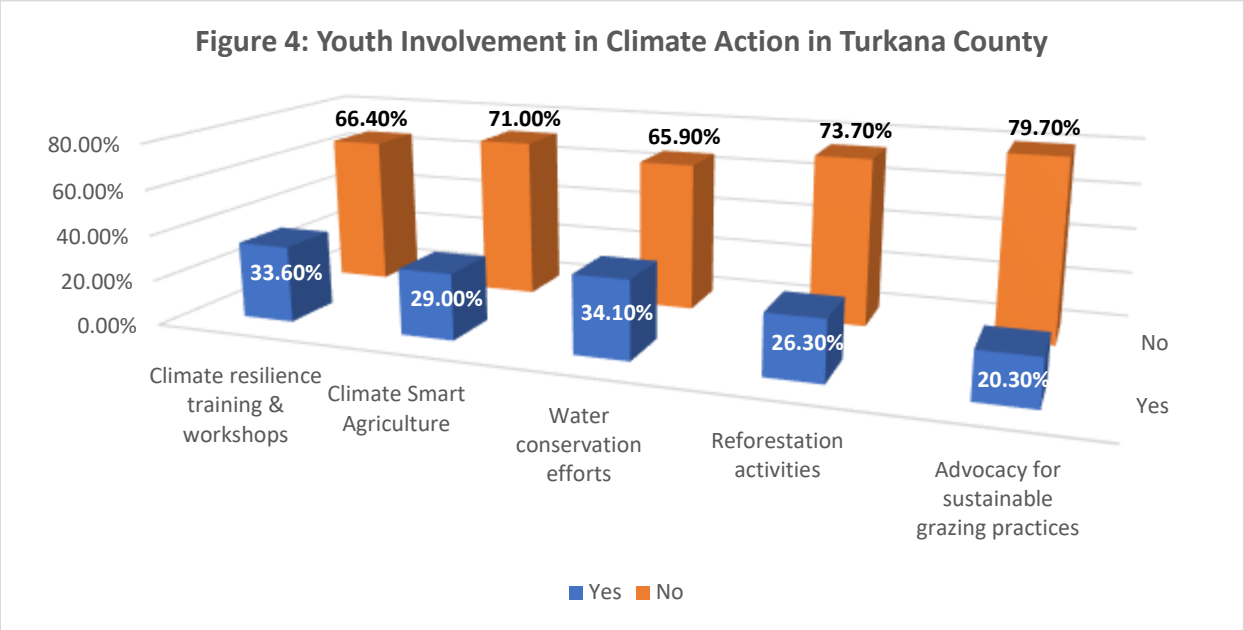

Source: Field Data, 2024

Youth Involvement in Climate Change

When the respondents were asked whether or not the youth in their community are participating in any of the climate initiatives in their community, 36.4% answered "YES" and 63.6% answered "NO." While the participation rates in each of these areas are encouraging, they remain relatively low, as discussed herein:

Climate Resilience Training and Workshops: While 33.6% of the respondents reported that the youth in their community are participating in climate resilience training and workshops, 66.4% answered to the contrary. This, therefore, means that a substantial number of youths are not involved in these programs, which are essential for equipping them with the knowledge and skills to adapt to the climate challenges in Turkana County. As noted by a key informant from the Ministry of Trade, Gender, and Youth Affairs, "Youth in Turkana County must be empowered to understand and respond to these climate-induced changes in order to foster community resilience." A key informant from a local NGO working further emphasized that climate adaptation workshops—covering sustainable land management, early warning systems, and disaster preparedness—are not just about imparting scientific knowledge but also about building practical skills that youth can directly apply in their communities.

Climate-Smart Agriculture: 29% of the respondents indicated that the youth are involved in climate-smart agriculture (CSA), a critical adaptation strategy in Turkana County, where agriculture and pastoralism are central to the economy. However, 71% of the respondents reported that the youth are not involved, confirming that a huge percentage of youth are not participating in the CSA practices, such as drought-resistant crops, agroforestry, and improved irrigation techniques, that help improve food security and economic stability in the face of unpredictable

rainfall patterns. A key informant from the Ministry of Agriculture, Livestock Development, and Fisheries emphasized that:

> *Turkana County government, together with its development partners, has a huge task in actively involving more youth in CSA practices in order to continue addressing the challenges of food insecurity and enhance the resilience of local farming and pastoral systems…*

Water Conservation Efforts: Water scarcity is one of the most pressing challenges in Turkana County, where both people and livestock struggle to access reliable water sources. 34.1% of the respondents reported that the youth in their community are involved in water conservation initiatives such as rainwater harvesting, water-efficient irrigation systems, and community-based water management. However, 65.9% of the respondents indicated that the youth are not participating in water conservation efforts in their community. A significant number of youths are, therefore, still left out of these relevant initiatives. According to a key informant from the Ministry of Water Services, "These water conservation efforts are essential for reducing the impact of droughts and ensuring that water remains available for future generation… We are in the process of involving more youth in these initiatives…"

Reforestation Activities: 26.3% against 73.7% of the respondents reported that youth in their community are actively involved in reforestation and afforestation projects. This, therefore, means that a huge population of youth are not involved in these initiatives, which are critical for mitigating the effects of climate change in Turkana County. A key informant from the NDMA emphasized that reforestation is a key strategy for combating soil erosion, desertification, and biodiversity loss, all of which are exacerbated by climate change in the region. An informant from the Ministry of Tourism, Culture, Natural Resources, and Climate Change confirmed that:

> *The county government of Turkana, in partnership with local NGOs, is involving youth in a tree planting project, especially native tree species, to restore degraded lands, improve soil fertility, and increase local water retention… However, more youth across the county should be involved in this project…*

Advocacy for Sustainable Grazing Practices: Pastoralism remains the cornerstone of the economy in Turkana County, but overgrazing, especially during drought periods, contributes to land degradation and biodiversity loss. 20.3% of the respondents reported that youth are advocating for sustainable grazing practices, such as pasture production, rotational grazing, maintaining adequate pasture cover, and managing livestock numbers in relation to available resources (pasture and grazing fields). One of the youth leaders reported, "A local NGO has trained my youth group on pasture farming along Turkwel River… We started engaging in fodder production business in our area, but water scarcity has continued to be a big challenge…" However, 79.7% of the respondents confirmed that many youths are not yet involved in these initiatives. A key informant from the Ministry of Agriculture, Livestock Development, and Fisheries highlighted that involving youth in promoting these practices is essential for ensuring that pastoralism remains a viable livelihood while protecting the land.

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Youth Motivation for Involvement in Climate Action

The findings reveal that youth in Turkana County are deeply motivated by the severe impacts of climate change on their daily lives, with a strong desire to secure a sustainable future, enhance local environmental management, and reduce their communities' vulnerability to climate-related challenges. When asked to tick all the motivations that are relevant to them in their involvement in climate change action, the participants responded as discussed herein:

Direct Impact of Climate Change on their Livelihoods: An overwhelming 94.5% of the respondents reported that youth's primary motivation for participation in climate action is the gross impact of climate change on their daily lives. A key informant from the NDMA stressed that, like other members of the Turkana community, youth are witnessing firsthand the devastating effects of erratic rainfall**,** prolonged droughts**,** and water scarcity—which threaten their food security and economic stability. The reduction in pasture and water resources, combined with declining crop yields, not only challenges their immediate survival but also threatens their future prospects. This direct, personal experience with climate change has driven youth to seek solutions through climate resilience initiatives that can help safeguard their way of life.

Desire for a Sustainable Future: Alongside the call to combat the pressing issues that climate change presents, 87.6% of respondents noted that the youth are driven by the desire to build a sustainable future for themselves and their communities. This also includes the long-term well-being of the environment and the ability to sustain future generations with resources such as water, land, and pasture. For youth, one key informant from the Ministry of Trade, Gender, and Youth Affairs echoed what is widely held as "Environmental stewardship is key to finding sustainable livelihoods that are less able to be shaken up by the whims of nature and very much rooted in sustainable agriculture and pastoral practice."

One of the youths in the focus group discussion said:

> *As a generation who will live that future, we recognize that a future life for us and our community is linked to the sustainability of our ecosystems, and so we take climate action as a fundamental pillar of our vision of a secure and stable life…*

Desire to Generate Livelihood Opportunities: Besides concerns for the environment, 79.7% of the respondents acknowledged that the youth are hopeful that climate action will create more livelihood options for them in their villages. As noted by a key informant from the Ministry of Trade, Gender, and Youth Affairs, "many youths in Turkana County are highly unemployed with limited access to economic resources and opportunities… So, involvement in climate action is like a livelihood activity for them…" A representative from an NGO further shared that climate action initiatives in Turkana County, especially those focused on climate-smart agriculture and sustainable resource management, present opportunities for equipping the youth with skills, nurturing entrepreneurship, and creating jobs for them. One key informant from the Ministry of Agriculture, Livestock Development, and Fisheries further indicated that:

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> *Sustainable farming practices, eco-tourism, and green energy projects can potentially drive jobs and economic development in Turkana County. So young people are fueled not just by the desire for a cleaner environment but by the promise of better careers for themselves and their families …*

Empowerment Through Knowledge and Skills: 83.4% of the respondents admitted that active participation in climate resilience training and workshops is an important source of motivation for youth in Turkana County. The youth believe these training opportunities will equip them with knowledge and practical skills while greatly expanding their understanding of climate issues and empowering them to advocate for policy changes and raise community awareness. For many youths, as noted by a key informant from the Ministry of Trade, Gender, and Youth Affairs, "the skills learned in these programs are transformative, enabling them to lead environmental advocacy, community education, and policy reform efforts…" One of the NGO informants also highlighted that empowered youth have a sense of agency, providing them the capacity to influence decisions on climate issues at the local, national, and global levels.

Intergenerational Responsibility and Leadership: 62.7% of the respondents reported that the youth are motivated by a sense of intergenerational responsibility. According to one of the youth leaders, "As youth, we recognize that we will inherit the consequences of today's environmental decisions, but we also see ourselves as the next generation of environmental leaders…" A key informant from the Ministry of Trade, Gender, and Youth Affairs emphasized, "Youth involvement in climate action reflects a growing understanding of their role in shaping the future of their communities…" By working alongside elders**,** community leaders**,** government, and NGOs**,** youth are actively shaping the direction of climate resilience efforts in Turkana County. As one of the youth leaders put it: "As leaders, we are committed to finding solutions to the environmental challenges we face and passing down a legacy of environmental stewardship to future generations…"

Barriers to Youth Participation in Climate Change Action

When asked to identify the barriers the youth face in getting involved in climate action in their community, the respondents identified several barriers as discussed herein:

Lack of Information and Awareness: One of the most significant barriers reported by 89.4% of the respondents is the lack of information by the youth about climate change and available initiatives across Turkana County. As one of the youth leaders confirmed, "This information gap is a major hindrance, as it limits our ability to take proactive steps or engage meaningfully in climate discussions, actions, and resilience efforts… You cannot be involved in something you do not know…"

Limited Opportunities for Involvement: 83.9% of the respondents highlighted that youth face limited opportunities to actively engage in climate initiatives despite their willingness to participate. This was reported as due to insufficient programming**,** geographical isolation of some areas**,** and lack of youth-centric climate action platforms in the county. According to one of the Local Chiefs:

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ISSN 2520-5307 (online)
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> *Most of the youth in our areas are not effectively involved in climate action projects because these projects are normally few, limited in scope, and short-lived… These initiatives sometimes do not reach our places because of the challenges of poor road networks and insecurity…*

Cultural Resistance to Modern Environmental Practices: Another critical barrier identified by 55.3% of respondents is the cultural resistance to modern environmental practices. According to a key informant from the Ministry of Agriculture, Livestock Development, and Fisheries, traditional practices in Turkana County are deeply entrenched in the local way of life, and many community members, particularly elders, and leaders, hold strong views about the value of these customs, sometimes viewing modern climate adaptation techniques (such as sustainable grazing or agroforestry) as foreign or unnecessary. This cultural divide often leads to conflict between the youth, who advocate for climate-smart practices**,** and older generations, who prioritize traditional knowledge and conventional methods.

Gender Roles and Cultural Expectations (Gender Disparity): Gender inequality is another significant barrier to Turkana County youth participation in climate action. 81.6% of the respondents reported that cultural expectations and gender roles often limit the opportunities available to young women**,** where women's roles are typically confined to household duties and caregiving. As indicated by a key informant from the Ministry of Trade, Gender, and Youth Affairs, "This relegates young women to the background in discussions and activities related to climate decision-making and sustainability…"

One of the Ward Administrators noted that:

> *While young men may be more easily mobilized for physical labour in reforestation or agricultural activities**,** young women face additional cultural constraints—including family responsibilities, gender-based violence, and limited access to education and training… As a result, women are often underrepresented in climate action efforts…*

Limited Support Networks: Youth participation in climate action in Turkana County is further compounded by limited support networks. 95.9% of the respondents recognized that youth often lack opportunities for mentorship or leadership training to guide and steer their climate action efforts. "As one of the youth leaders remarked, "With little access to experts, mentors, and networks of like-minded peers, it is so much harder for us to get momentum going to our youth-led projects or even find the activation energy and support we need for climate action in our communities …"

Limited Climate Change Education Opportunities: 89.4% of the respondents indicated that there were limited climate change education and training opportunities in most parts of Turkana County. In addition, 62.5% of the educated respondents stated that formal education systems (primary and secondary schools) do not always provide specific programs on climate change, environmental management, or sustainability. Moreover, even if such informal training programs are available, they might not have access to them because of the geographic isolation of some places, costs, or lack of infrastructure. Additionally, 73.7% of respondents reported insufficient technical skills among the youth to help them engage in climate-smart agriculture, sustainable land management,

or renewable energy projects. As some key informant from the Ministry of Education, Sports, and Social Protection expressed, "The government is doing its best to mobilize resources, even with the support from our development partners, to scale up climate education, training, and awareness creation among the youth throughout Turkana County…"

CONCLUSION AND RECOMMENDATIONS

Summary

This study explored the link between youth and climate change in the context of pastoralist communities in the IGAD's Karamoja Cluster, with the case study of Turkana County in Kenya. It particularly examined the youth's understanding of climate change, finding that while some awareness exists, it is largely shaped through personal experience — not formal education. Climate change has majorly impacted the lives of youth, including disruption of traditional livelihoods, increased vulnerabilities, and heightened resource-based conflicts. However, despite these challenges, Turkana youth are rising to meet this issue head-on, engaging in grassroots advocacy, conservation of the environment, and sustainable projects for their livelihoods. The findings emphasize the importance of empowering and harnessing youth as change agents for climate action and resilience building in their communities.

Conclusion

The study highlights the critical and diverse role of youth in the climate change landscape of Turkana County, Kenya. While they encounter significant challenges due to limited formal education in climate policy, processes, and the harsh realities of climate change, their active participation in community-based climate actions demonstrates their potential and agency in promoting resilience and adaptation. To empower them to make the greatest contributions, targeted interventions to improve climate education, increase economic opportunities, and bolster youth-led initiatives are urgently needed. Increasing the capacity of youth and collaboration throughout the IGAD's Karamoja Cluster is vital for nurturing resilient pastoralist communities in the face of changing climatic conditions now and in the future. The findings of this study have broader implications for other pastoralist communities in the IGAD region because the experience, dynamics, and settings in the context of climate change impact are similar.

Policy and Programmatic Recommendations

The study has identified seven main recommendations. By implementing the following recommendations, stakeholders can empower youth in Turkana County to play a pivotal role in combating climate change, ultimately promoting resilience and sustainable development in the region.

1. *Empower Youth with Climate Education:* Climate education must be integrated into the local curriculum and align with non-formal education initiatives across Turkana County. Such training should extensively cover the local, national, regional, and global dimensions of climate change. Education initiatives and programs that focus on vocational skills in sustainable agriculture, water management, environmental reclamation, and renewable energy can help empower youth to be effective climate advocates in their communities.

Journal of Developing Country Studies
ISSN 2520-5307 (online)
Vol.8, Issue 2, pp 74 -109, 2024

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2. *Increase Youth Inclusion in Climate Policy:* This does not only mean a few representatives from youth organizations or groups being invited to join conversations with government and development organizations on climate policies; it means being purposefully invited, deliberately included, and meaningfully engaged in the climate debate and decision-making processes. County government can establish youth advisory councils or committees focused on climate policy to ensure the perspectives and interests of young people are heard and included in related processes. Involving youth is not only empowering but also brings to the table ideas of diversity and innovation in policymaking with a comprehensive understanding of different perspectives.
3. *Invest in Youth-Led Climate Action:* Resources must be allocated to support youth activities to increase their impact. This includes providing financial resources, training programs, and access to technologies to support the implementation of climate-smart solutions. Their impact and sustainability can be extended, and a more enabling environment can be created for young climate leaders, with support through multi-stakeholder, multilevel partnerships with youth-led organizations, local authorities, and international NGOs.
4. *Promote Awareness Campaigns:* The government and development partners collaborate to facilitate advocacy awareness campaigns targeting youth and the wider community to increase understanding of climate change issues. To do this, campaigns must use whatever platforms are available in their particular context (social media, community workshops, local events, etc.) to disseminate information and mobilize for collective action. Climate issues can seem distant until they are told in local stories — stories that motivate people to participate.
5. *Facilitate Access to Resources and Networks:* Government and NGOs to facilitate the establishment of systems to provide youth with access to required resources, best practices, funding initiatives, training workshops, and mentorship programs. Creating networks so that young climate advocates can be mentored by more seasoned pros, sharing wisdom and supporting their activism, can go a long way. It could also help youth from the IGAD's Karamoja Cluster and beyond work together to address climate challenges with collective strengths.
6. *Incorporate Traditional Knowledge into Scientific Approaches:* Government and NGOs should recognize, incorporate, and implement traditional knowledge and practices in their respective climate action projects. Pulling local elders and community leaders into the conversation and integrating modern scientific approaches with how things have been done traditionally can give climate strategies more relevance and have greater chances for success. This partnership will also create more buy-in and support from the local community in Turkana County for youth-led climate initiatives.

7. *Infrastructure Improvement:* Investments in climate-resilient infrastructure, including all-weather roads and durable market structures, can bring improved access to economic opportunity, healthcare, and education and reduce disruptions from floods and storms. Critical policy recommendations here include embedding climate resilience in Turkana County Integrated Development Plans (CIDPs), accessing the national and global funding streams such as through the Green Climate Fund (GCF), harnessing private sector partnerships (PPPs) for financing, and implementing infrastructure projects towards climate adaptation with youth involvement for local capacity and sense of ownership.

Future Research

- *Assessment of Youth-Led Initiatives:* Very few empirical assessments of youth-led climate initiatives exist in pastoralist contexts. However, more work is needed to understand the effectiveness of these initiatives and the drivers of their success or failure.
- *Technological Innovations and Youth Involvement:* Research on the innovative ways that technology (e.g., mobile apps for weather forecasting, techniques for climate-resilient farming) can be deployed to engage youth in Turkana County in climate change adaptation and mitigation.

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