



THE CLIMATE MIGRATION NEXUS IN LUPANE, ZIMBABWE: ADAPTING TO CHANGE OR FLEEING A CRISIS?

Douglas Nyathi¹, Joram Ndlovu², Mkhokheli Sithole³,
Mandlenkosi X Gama⁴

1. School of Public Management, Governance and Public Policy, University of Johannesburg, South Africa; Email: dnyathi@uj.ac.za.
2. School of Social Sciences, University of KwaZulu Natal, Howard College, Durban, South Africa, ndlovuj1@ukzn.ac.za.
3. Institute of Development Studies, National University of Science and Technology, Bulawayo, Zimbabwe, mkhokheli.sithole@nust.ac.zw.
4. Department of Development Studies, Lupane State University, Lupane, Zimbabwe.

Article Information:

Article Type:
Research Article

Manuscript Received:
13 January 2025

Final Revision Received:
15 September 2025

Accepted:
10 June 2025

Published Online:
15 October 2025

Keywords
Climate change,
Migration, Vulnerability,
Resilience, Remittances

Abstract:

This study explores the impact of climate change on migration decisions in Ward 19 of Lupane District, Zimbabwe, using qualitative methods, such as key informant interviews, focus groups, and in-depth discussions. Findings indicate that increasing climate variability, especially prolonged droughts, erratic rainfall, and declining water resources, has severely disrupted agriculture, prompting households to adopt migration, both internal and cross-border, as a coping mechanism. Although migration can provide temporary relief through remittances and livelihood diversification, it also often creates new challenges. These include family separation, reduced rural labour, and heightened strain on infrastructure. Women are particularly affected as they take on expanded roles in managing farms and households in the absence of migrating men, often without adequate resources or institutional support. The study concludes that while migration can enhance resilience for some households, it also deepens existing vulnerabilities, especially among poorer households. Addressing climate-induced migration effectively requires integrated multidimensional strategies. Key policy recommendations include investing in community-based adaptation, adopting gender-sensitive interventions, and formally recognizing migration as a legitimate climate adaptation strategy. Embedding these approaches into local and national policy frameworks is crucial for building resilience and minimizing the adverse effects of climate-driven displacement.

Cite this article: Douglas Nyathi, Joram Ndlovu, Mkhokheli Sithole and Mandlenkosi X Gama (2026). The Climate Migration Nexus in Lupane, Zimbabwe: Adapting to Change or Fleeing a Crisis? The Journal of Sustainable Development, Law and Policy. Vol. 17:2. 54-78. DOI: 10.4314/jsdlp.v17i2.3.



© The Author(s)

Publisher: Institute for Oil, Energy, Environment and Sustainable Development (OGEES Institute), Afe Babalola University, Ado Ekiti, Nigeria.

1.0 INTRODUCTION: FRAMING THE PROBLEM AND SUSTAINABILITY CONTEXT

Climate change is expected to significantly impact global migration patterns throughout the 21st century. The median projections suggest that climate change will permanently relocate 62 million working-age individuals by 2100¹². An estimated 22.5 million people have been displaced by climate change since 2008, primarily internally and regionally³. The impacts of climate change are transpiring to all continents, presenting a complex situation for humanity in making choices for survival⁴. Climate change is likely to worsen existing global inequalities, accelerate urbanization, and increase migration from low- to high-latitude regions. However, the relationship between climate change and migration is complex and nonlinear, with various effects observed worldwide. Climate change is increasingly being recognized as a significant driver of migration patterns worldwide, with forced displacements rising significantly in recent years. Furthermore, international migration laws and policies remain restrictive, with only a small fraction of climate-displaced populations being able to move beyond national borders⁵. Climate shocks are unlikely to induce substantial international flows of migrants, except under extremely pessimistic climate scenarios and highly permissive migrations⁶. In Sub-Saharan Africa, the impact of climate change has been particularly acute, leading to increased migration as a coping and adaptation strategy. Rising temperatures, changing rainfall patterns, and extreme weather events have affected the agricultural productivity and food security in the

¹ Burzyński et al. Climate Change, Inequality, and Human Migration. Journal of the European Economic Association, [2021]. 1145.

² IPCC. (2023). *Sixth Assessment Report: Impacts, Adaptation, and Vulnerability*. Intergovernmental Panel on Climate Change. <https://www.ipcc.ch>

³ Butros et al. Solidarity Versus Security: Exploring Perspectives on Climate-Induced Migration in UN and EU Policy. Environmental Communication [2021]. 842.

⁴ Jolly & Ahmad. Conceptualizing the Climate Change Migration in South Asia. [2018]. 15.

⁵ IOM. (2020). *Migration, Environment and Climate Change: Policy Brief Series*. International Organization for Migration. <https://www.iom.int>

⁶ Burzyński et al. Climate Change, Inequality, and Human Migration. Journal of the European Economic Association, [2021]. 1145.

region^{7,8}. These environmental stressors exacerbate existing vulnerabilities, particularly in rain-fed agricultural systems, where numerous livelihoods depend⁹. Migration is emerging as a critical response to climate change in sub-Saharan Africa. Both seasonal and permanent migrations are increasingly utilized by households to address climate variability¹⁰. However, the relationship between climate change and migration is complex and varies across regions (Table 1). For instance, while communities in South Asia perceived climate change as a significant factor encouraging migration, similar large-scale migration was not observed in sub-Saharan Africa¹¹. Factors such as geographic location, development level, and agricultural dependency influence the climate change-migration nexus¹².

Table 1. Relationship between climate change impacts and migration trends across different regions

Region	Climate Change Impact	Migration Trends
Sub-Saharan Africa	Severe droughts, desertification, and resource scarcity	Rural-urban migration and cross-border movement to Europe

⁷ Serdeczny et al., Non-economic loss and damage: addressing the forgotten side of climate change impacts. [2016]. <https://hdl.handle.net/2066/253139>

⁸ FAO. (2022). *The State of Food and Agriculture: Leveraging automation for transforming agrifood systems*. Food and Agriculture Organization of the United Nations. <https://www.fao.org>

⁹ Serdeczny et al., Non-economic loss and damage: addressing the forgotten side of climate change impacts. [2016]. <https://hdl.handle.net/2066/253139>

¹⁰ Joseph Kof Teye & Ebenezer G. A. Nikoi. Climate-Induced Migration in West Africa [2022] 79.

¹¹ Stojanov, R., & Duží, B. Migration as an Adaptation to Climate Change [2013] Czech Journal of International Relations 48, 9

¹² Bannor, F., Magambo, I. H., Mahabir, J., & Tshitaka, J. M. (2023). Interdependence between climate change and migration: Does agriculture, geography, and development level matter in sub-Saharan Africa?. *South African Journal of Economics*, 91(2), 141-160.

South Asia	Flooding, extreme heat, and monsoon variability	Internal displacement and migration to Gulf countries
Latin America	Deforestation, hurricanes, and coastal flooding	Urbanization and emigration to North America
Middle East & North Africa	Water scarcity, extreme heat, and desertification	Migration within the region and to Europe
Europe	Flooding, sea-level rise, and extreme weather events	Intra-regional migration and asylum-seeking
North America	Wildfires, hurricanes, and rising sea levels	Internal relocation and immigration from Latin America
East Asia & Pacific	Typhoons, sea-level rise, and resource depletion	Internal displacement and migration to Australia

Source¹³

In Zimbabwe, climate change threatens rural livelihoods, particularly in the dryland regions. Farmers in semi-arid areas, such as the Omay communal lands, are especially vulnerable due to their reliance on rain-

¹³ The White House. Report on The Impact of Climate Change on Migration. [2021] <https://www.whitehouse.gov/wpcontent/uploads/2021/10/Report-on-the-Impact-of-Climate-Change-on-Migration.pdf>

fed agriculture for food and income^{14,15}. The impacts manifest through various indicators, including hydrological changes in water bodies and ecological shifts in flora and fauna behaviour¹⁶. Rural women are disproportionately affected and face challenges such as food insecurity, limited access to land and finance, and deepened poverty^{17,18}. Notably, while numerous studies have focused on rural areas, urban regions are also affected by climate-induced migration, although this aspect is often overlooked in research¹⁹. Although adaptation strategies such as conservation agriculture have been implemented²⁰, their effectiveness is limited by environmental constraints and non-climatic vulnerability factors^{21,22}. Human short- and long-term mobility has become an increasingly significant adaptation strategy for households in small-scale farming regions that seek food security²³. This migration trend highlights the complex interplay among climate change, agricultural productivity, and human displacement in the drylands of rural Zimbabwe. It is essential to note that migration can expose individuals to new risks such as infectious diseases and food price increases in urban areas²⁴.

¹⁴ GoZ (Government of Zimbabwe). (2021). *Zimbabwe's National Climate Policy*. Ministry of Environment, Climate, Tourism and Hospitality Industry.

¹⁵ Chipu P. Mubaya and Mzime R. Ndebele-Murisa. A Landscape Approach Toward Adaptation Under a Changing Climate in Omay Communal Lands, Zimbabwe [2017] 101.

¹⁶ Nelson Chanza and Walter Musakwa. Revitalizing indigenous ways of maintaining food security in a changing climate: a review of the evidence bases from Africa [2022] 252.

¹⁷ UN Women. (2022). *Climate change and gender inequality in rural Zimbabwe*. United Nations Women. <https://www.unwomen.org>

¹⁸ Serdeczny et al., Non-economic loss and damage: addressing the forgotten side of climate change impacts. [2016]. <https://hdl.handle.net/2066/253139>

¹⁹ Raphael J Nawrotzki, Lori M Hunter, Daniel M Runfola et al., Climate change as a migration driver from rural and urban Mexico. *Environment Research Letters* [2015] 10, 114023.

²⁰ Munyaradzi Admire Dzvimbo, Tinashé Mitchell Mashizha, Monica Monga et al., *Journal of Social and Development Sciences* [2017] 8, 38.

²¹ Chikozho, C. (2020). *Building climate resilience in semi-arid regions of Southern Africa: Evidence from Zimbabwean smallholder farming communities*. *African Journal of Environmental Science and Technology*, 14(5), 123–134

²² Chanza, N., Chigona, A., Nyahuye, A. et al. Diagnosing barriers to climate change adaptation at community level: reflections from Silobela, Zimbabwe. *GeoJournal* [2019] 84, 771. <https://doi.org/10.1007/s10708-018-9890-3>

²³ Trymore Maganga & Catherine C. Suso. The impact of colonial and contemporary land policies on climate change adaptation in Zimbabwe's communal areas [2022] 14.

²⁴ Serdeczny et al., Non-economic loss and damage: addressing the forgotten side of climate change impacts. [2016]. <https://hdl.handle.net/2066/253139>

Addressing these challenges requires integrated policy responses that strengthen adaptation strategies, invest in health systems, and incorporate migration into the broader climate and development planning^{25,26}. This study makes two contributions to the literature. First, it focuses on a relatively underexplored area, climate-induced migration in rural Zimbabwe, with special attention to gender dynamics. Second, it provides empirical insights from Ward 19 in Lupane District to deepen our understanding of how communities adapt to climate pressure. This study explored the interplay between climate vulnerability, migration patterns, household impacts, and gendered responses. This paper is organized into seven key sections. Section 2 presents conceptual clarifications and a literature review of climate-induced migration. Section 3 outlines the study setting and methodology. Section 4 explains the study site and its significance. Section 5 presents the findings organized under four thematic areas: climate vulnerability, migration patterns, household impacts, and gendered responses. Section 6 offers broader recommendations, and Section 7 discusses the conclusions and suggests future research directions.

2.0 UNDERSTANDING CLIMATE-INDUCED MIGRATION: INSIGHT FROM THEORITICAL APPROACHES

The research was grounded in the Environmental Migration Theory and the Push-Pull Theory. The Environmental Migration Theory is widely acknowledged as a comprehensive framework for examining the relationship between climate change and human migration. This theory posits that environmental factors, particularly climate change, can serve as significant push factors that drive individuals to relocate in the pursuit of improved living conditions²⁷. Climate-related phenomena such as droughts, floods, desertification, and rising sea levels disrupt local

²⁵ Joseph Kof Teye & Ebenezer G. A. Nikoi. Climate-Induced Migration in West Africa [2022] 79.

²⁶ Kotir, J.H. Climate change and variability in Sub-Saharan Africa: a review of current and future trends and impacts on agriculture and food security. *Environ Dev Sustain* [2011] 13, 587. <https://doi.org/10.1007/s10668-010-9278-0>

²⁷ Alex de Sherbinin, Kathryn Grace, Sonali McDermid et al., Migration Theory in Climate Mobility Research.) Migration Theory in Climate Mobility Research. *Frontiers in Climate Change*.

[2022] 4:882343.
<https://doi.org/10.3389/fclim.2022.882343>

ecosystems, resulting in considerable strain on livelihoods, food security, water availability, and shelter²⁸. These environmental disturbances are recognized as the primary catalysts for both internal and international migration²⁹. A fundamental principle of this theory is that isolated climate change seldom causes environmental migration. Instead, they are influenced by various social, political, and economic factors that interact with the environmental stressors³⁰. Climate change amplifies existing vulnerabilities such as poverty, weak governance, and economic instability, impacting individuals' decisions to migrate³¹. This underscores the intricate, multifaceted nature of climate-induced migration. Environmental Migration Theory provides a valuable framework for comprehending how environmental changes, particularly climate change, intersect with migration patterns³². It emphasizes the role of environmental stress as a catalyst for human mobility, while acknowledging the complexity of migration as influenced by various interconnected factors. Despite these limitations, this theory highlights the importance of considering environmental factors in migration policies and adaptation strategies³³.

The push-and-pull theory of migration, also called Lee's push-pull theory, is a prominent concept in migration studies that seeks to elucidate the factors that drive human movement. This theory posits that

²⁸ Stacy Warner, Shannon Kerwin and Matthew Walker. Examining Sense of Community in Sport: Developing the Multidimensional 'SCS' Scale. [2013] 27, 349. <https://doi.org/10.1123/jsm.27.5.349>

²⁹ Pratikshya Bohra-Mishra, Michael Oppenheimer, and Solomon M. Hsiang. Nonlinear permanent migration response to climatic variations but minimal response to disasters. [2014] 111, 9780. <https://doi.org/10.1073/pnas.1317166111>

³⁰ Alex de Sherbinin, Kathryn Grace, Sonali McDermid et al., Migration Theory in Climate Mobility Research.) Migration Theory in Climate Mobility Research. *Frontiers in Climate Change*. [2022] 4:882343.

<https://doi.org/10.3389/fclim.2022.882343>

³¹ Hugo, Graeme. Environmental concerns and international migration." *International migration review* [1996] 30, 105.

³² Hunter, L.M., Nawrotzki, R. Migration and the Environment. In: White, M. (eds) *International Handbook of Migration and Population Distribution*. *International Handbooks of Population*. [2016] 6. Springer, Dordrecht. https://doi.org/10.1007/978-94-017-7282-2_21

³³ Stacy Warner, Shannon Kerwin and Matthew Walker. Examining Sense of Community in Sport: Developing the Multidimensional 'SCS' Scale. [2013] 27, 349. <https://doi.org/10.1123/jsm.27.5.349>

migration occurs due to a combination of 'push factors,' which are negative conditions in the place of origin that encourage people to leave, and 'pull factors,' which are positive aspects or opportunities at the destination that attract migrants³⁴. These factors encompass the economic, social, political, and environmental dimensions. Lee further suggested that each location possesses a unique combination of advantages and disadvantages³⁵. The push-pull theory provides additional insights into these dynamics when applied to ecological migration. Environmental degradation, such as desertification, crop failure, and water scarcity, is a 'push' factor that compels individuals to depart from vulnerable areas. Conversely, 'pull' factors, such as enhanced economic prospects, political stability, and improved resources, entice migrants towards more favourable regions³⁶. This theoretical framework highlights the dual impact of environmental changes in prompting migration and in influencing the selection of destination locations. Moreover, this theory facilitates a comprehensive grasp of migration by concurrently examining the adverse effects of climate change (push) and positive opportunities (pull) that attract migrants to new areas. This dual perspective is crucial to capture the intricacies of migration patterns in the context of climate-induced stress.

3.0 STUDY SETTING, METHODS AND MATERIALS

The research was carried out in Ward 19 of the Lupane District (see Figure 1 below), a largely rural region where most inhabitants rely on subsistence agriculture and animal husbandry for their livelihoods³⁷, with marked seasonal changes and well-defined wet and dry periods that significantly affect farming practices and subsistence. The Zimbabwe Meteorological Services (ZMS) report that temperature variations

³⁴ Ellen M. Hoffmann, Verena Konerding, Sunil Nautiyal et al., Is the push-pull paradigm useful to explain rural-urban migration? A case study in Uttarakhand, India. [2019] <https://doi.org/10.1371/journal.pone.0214511>

³⁵ Lee, E.S. A theory of migration. *Demography* [1996] 3, 47. <https://doi.org/10.2307/2060063>

³⁶ Lee, E.S. A theory of migration. *Demography* [1996] 3, 47. <https://doi.org/10.2307/2060063>

³⁷ Smallholder farmer drought coping and adaptation strategies in Limpopo and Western Cape provinces. [2020] Water research commission.

throughout the year mark the subtropical climate of Lupane³⁸. The summer months, from November to March, are characterized by high temperatures ranging from 20°C to 30°C, with humid conditions and intermittent rainfall, while the winter period from May to August saw cooler temperatures between 10 °C and 25°C, accompanied by drier weather (Weather Atlas). The average annual temperature of Lupane is approximately 20°C, which reflects these seasonal fluctuations. The Ndebele people primarily inhabit the district, whose cultural customs, including traditional governance structures and communal decision-making processes, play a crucial role in shaping the community dynamics. The main economic activities revolve around farming and livestock rearing, with maize as the principal crop.

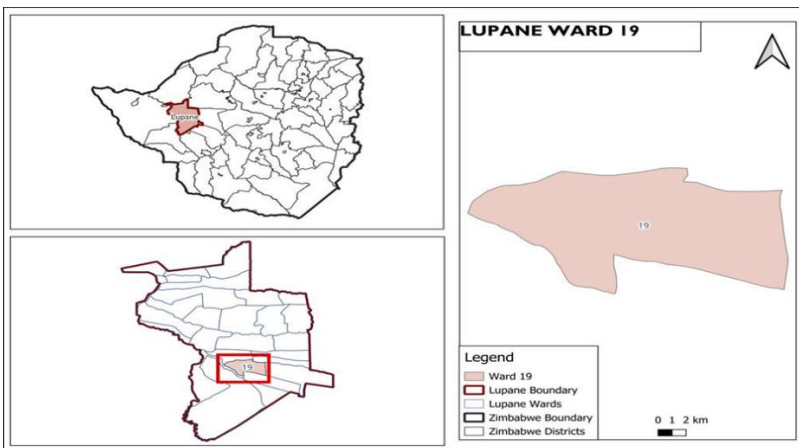


Fig 1. Lupane Map showing Ward 19

Source: Created by Authors

³⁸ Final Report, Drought Hazard Risk and Humanitarian Impact Analysis and Inventorisation of Forecast Models in Zimbabwe [March 2021] Forecast based action –Drought Hazard Risk and Humanitarian Impact Analysis.

This study utilized a qualitative approach to investigate migration to adapt to climate change in the Lupane District of Zimbabwe. Qualitative methodologies are particularly effective for capturing individual experiences and identifying broader trends in climate change adaptation³⁹. This study focused on individuals and households affected by climate change who had contemplated or undertaken migration as a response. Participants with relevant experiences were selected through purposive sampling, a technique Bernard⁴⁰ suggested by Bernard for populations facing unique challenges. Data collection involved semi-structured interviews and focus groups that provided detailed insights into the experiences, attitudes, and perceptions of migrants, their families, and community leaders. The data analysis process was systematic and rigorous, beginning with verbatim transcription of audio recordings and accuracy verification⁴¹. Emerging patterns and themes in the data were identified, classified, and coded using a thematic analysis. An inductive approach allows themes to emerge organically without preconceived hypotheses⁴². This qualitative methodology offers a comprehensive understanding of the opportunities, challenges, and implications of migration as an adaptation strategy in the context of climate change in Lupane, thereby yielding valuable insights into the role of migration in climate resilience.

4.0 JUSTIFICATION AND SIGNIFICANCE OF THE STUDY SITE

Ward 19 in the Lupane District is a powerful example of how climate change reshapes rural life. Like many others in Zimbabwe's drylands, this community relies heavily on small-scale and livestock farming.

³⁹ Robert A. McLeman and Lori M. Hunter. Migration in the context of vulnerability and adaptation to climate change: insights from analogues. *WIREs Climate Change* [2010] 305. <https://doi.org/10.1002/wcc.51>

⁴⁰Bernard, H. Russell. Research methods in anthropology: Qualitative and quantitative approaches. Rowman & Littlefield [2017].

⁴¹ Levitt, H. M., Bamberg, M., Creswell, J. W., et al., Journal article reporting standards for qualitative primary, qualitative meta-analytic, and mixed methods research in psychology: The APA Publications and Communications Board task force report. *American Psychologist*, [2018] 73, 26. <https://doi.org/10.1037/amp0000151>

⁴² Thomas, N. Hypothesis Testing and Bayesian Estimation using a Sigmoid E max Model Applied to Sparse Dose-Response Designs. *Journal of Biopharmaceutical Statistics*, [2006].16, 657. <https://doi.org/10.1080/10543400600860469>

However, with rains becoming increasingly unreliable and droughts now a regular part of life, families struggle to grow food and make a living. Consequently, many are forced to make difficult choices, often deciding to leave home in search of better opportunities elsewhere. This study is important because it shows how deeply climate change affects real people in Ward 19, not just through failed crops or dry wells but by pushing them to uproot their lives entirely. Migration has become a coping strategy and way to survive. People are moving to cities such as Bulawayo or even crossing borders into South Africa and Botswana. However, leaving comes with challenges, especially for family members left behind. This study sheds light on how these shifts are changing households. With many men leaving, women are stepping into new roles—managing farms, raising children, and trying to keep things together—often with little support. Their resilience is evident; however, they also face heavy burdens. Focusing on Ward 19, this study offers a window into how climate change affects everyday life. It helps us understand the complex relationship between climate stress, migration, and resilience, and why we need policies that support families before and after they are forced to leave. The insights from this research can help shape more responsive, community-focused solutions for Lupane and other regions that face similar struggles.

5.0 STUDY FINDINGS AND DISCUSSION

5.1. The dynamics of climate change vulnerability and impact

The first research question investigated the perceived effects of climate change and vulnerability in the examined region. When querying participants about how climate change affected their daily lives and means of subsistence as well as their views on the causes of vulnerability in their study ward, responses encompassed various interrelated elements. The interactions revealed that Lupane, similar to other districts in the drier parts of Zimbabwe, experiences considerable climate variability. Study participants suggested that extended periods of drought and unpredictable rainfall patterns have become more common in recent years, a phenomenon associated with climate change. The community's dependence on rain-fed agriculture makes it extremely vulnerable. Crops such as maize, which are essential staples, often fail because of unpredictable rainfall, resulting in food shortages, financial

struggles, and displacement. The female head of the household highlighted this issue:

In this community, smallholder farming has been severely affected by climate change. We have consistently experienced droughts and heat waves every year. These conditions make it nearly impossible for those who rely on rainfall for agriculture to succeed. Most of us lack the resources to implement irrigation systems. Only those with offspring living abroad have these capabilities.

The community's heavy dependence on rain-fed farming makes it highly vulnerable. Crops such as maize, which are staple foods, often fail because of unpredictable rainfall. This leads to food shortages, financial struggles, and sometimes forces people to leave their homes. A woman who heads her household has a similar perspective.

Changes in climatic conditions have created challenges for this community. Grazing is now a challenge, and it has been coupled with water shortages for both domestic and animal use. Most of the wells in our community run dry, forcing women and girls to walk long distances in search of water. As you know, it is unsafe for women to roam while searching for water. This makes them vulnerable to sexual abuse and increases their workloads.

The findings of this study are supported by several academics, who argue that rural areas in Zimbabwe, South Africa, and Malawi are deeply impacted by climate change. This has far-reaching effects on agriculture, livelihood, and overall vulnerability⁴³. In Zimbabwe, climate change has triggered food shortages, water scarcity, and livestock loss, as farming remains the primary source of livelihood⁴⁴. Similarly, farmers in Malawi face crop failure caused by climate stress, poor soil quality, and limited

⁴³ Ndlovu Joram & Douglas Nyathi. Complexities of Conflict: Climate Change, Elephants and Local Livelihoods in Lupane, Zimbabwe. E-Journal of Humanities, Arts and Social Sciences (EHASS), [2024] 5, 2720

⁴⁴ Happy M. Tirivangasi and Louis Nyahunda. Challenges faced by rural people in mitigating the effects of climate change in the Mazungunye communal lands, Zimbabwe. [2019] 11.

resources, forcing them to adapt⁴⁵. Matabeleland South Province in Zimbabwe, once thriving in livestock and grain production, now relies on humanitarian aid owing to climate variability⁴⁶. Across these countries, rural populations are among the most vulnerable to climate change, with agriculture being the hardest. To adapt, people diversify their income sources, adopt climate-smart farming practices, and work to improve their access to information and resources⁴⁷.

5.2. Climate change and migration patterns in ward-19

The second research question explored how climate change influences migration trends in the study area. Specifically, we investigated the extent of climate-induced migration in selected wards. Participants highlighted a strong link between migration patterns, climate change, and regional variability. Discussions revealed that as climate change makes rural areas less viable for farming and livestock rearing, many residents of Lupane move to urban centres, such as Bulawayo, Hwange, and Victoria Falls, in search of better opportunities. One focus group discussion pointed out that urban migration is often driven by the need to find alternative sources of income, such as informal jobs in the service and retail sectors. A key informant echoed this sentiment.

Youth in our community struggle to cope with unemployment, exacerbated by the failure of rain-dependent agriculture. As a result, we observed young people leaving neighbouring urban areas in pursuit of improved opportunities. Some have been compelled to relocate to regions that are rich in gold deposits.

Research has found that climate change has also increased migration from the study ward to other rural areas. Participants shared that some

⁴⁵ Jeanne Y. Coulibaly, Glwadys A. Gbetibouo, Godfrey Kundhlande et al., Responding to Crop Failure: Understanding Farmers' Coping Strategies in Southern Malawi. Sustainability [2015] 7, 1620. <https://doi.org/10.3390/su7021620> [2015]

⁴⁶ Everson Ndlovu, Barend Prinsloo and Tanya le Roux. Impact of climate change and variability on traditional farming systems: farmers' perceptions from south-west, semi-arid Zimbabwe. [2020] 12. <https://hdl.handle.net/10520/ejc-jemba-v12-n1-a9>

⁴⁷ Nyahunda, L., & Tirivangasi, H. M. (2022). Adaptation strategies employed by rural women in the face of climate change impacts in Vhembe district, Limpopo province, South Africa. *Management of Environmental Quality: An International Journal*, 33(4), 1061-1075.

individuals and families from Lupane were forced to move to different parts of Zimbabwe, especially to regions that still support agricultural activities. Depending on the severity of the climate-related challenges, these relocations can be temporary or permanent. People aim to secure their food supplies and rebuild their livelihoods by moving to areas with better soil quality or more reliable rainfall. One participant shared an example, mentioning that his neighbour had relocated to Gokwe in the Midlands Province because of its better agro-ecological conditions than Lupane District. He remarked:

A fellow resident from our area relocated his household to Gokwe. Having lost faith in the agricultural prospects of the region, he sought a new place in Gokwe. Upon securing a suitable location, he promptly moved to his family and livestock. Over the past three years, it appears that he has been far better than those of us who have remained behind.

The participants also highlighted that climate change influences cross-border migration. Many people from Lupane have been observed moving to neighbouring countries such as South Africa, Botswana, and Zambia. Economic challenges, often exacerbated by climate change, have pushed individuals to search for better living conditions and opportunities abroad. These migrants typically find work in sectors such as agriculture, mining, or the informal economy, and often send remittances back to their families in Lupane.

Climate change significantly shapes African migration patterns, creating complex and sometimes contradictory effects on rural-to-urban migration trends. Research shows that climate-related migration is on the rise in several African countries including Ghana, Uganda, Tanzania, and Ethiopia⁴⁸. The traditional concept of circular migration, in which individuals temporarily move to urban areas before returning to rural villages, is challenged by changing environmental conditions.

The relationship between migration and environmental change is complex and shaped by multiple factors, including remittances, labour shortages, social and economic inequalities, gender roles, and cultural

⁴⁸ Wolde SG, D'Odorico P, Rulli MC. Environmental drivers of human migration in Sub-Saharan Africa. *Global Sustainability*. [2023] 6:e9.<https://doi.org/10.1017/sus.2023.5>

influences⁴⁹. The effects of climate change are particularly evident in urban areas, where rising temperatures and declining rainfall have significantly reduced out-migration⁵⁰. This contradicts the common belief that climate-induced migration is mainly short-distance and domestic migration. For example, research on rural Mexico shows that climate change has substantially influenced international migration patterns⁵¹.

5.3. Consequences of Climate-Induced Migration on Left-Behind Households

The third research question investigates the effects of climate-induced migration in the study ward. Participants demonstrated awareness of the consequences of the phenomenon, recognizing both positive and negative impacts on households. This discussion revealed that some families experienced adverse outcomes due to climate-induced migration. Table 2 shows how climate-induced migration has multifaceted effects, providing a balanced perspective on the complexity of this phenomenon.

Table: 2 Consequences of Climate-Induced Migration on Left-Behind Households

Aspect	Key Observations	Implications
Loss of Livelihood	Migration caused by droughts or poor harvests often leads to loss of land and other	Increases economic vulnerability and reduces agricultural productivity.

⁴⁹ Greiner, C., Sakdapolrak, P. Rural-urban migration, agrarian change, and the environment in Kenya: a critical literature review. *Population and the Environment* [2013] 34, 524. <https://doi.org/10.1007/s11111-012-0178-0>

⁵⁰ Valerie Mueller, Glenn Sheriff, Xiaoya Dou et al., Temporary migration and climate variation in eastern Africa. *World Development* [2020] 126, 104704. <https://doi.org/10.1016/j.worlddev.2019.104704>.

⁵¹ Nawrotzki, R.J., DeWaard, J., Bakhtsiyarava, M. et al. Climate shocks and rural-urban migration in Mexico: exploring nonlinearities and thresholds. *Climatic Change* [2017] 140, 243. <https://doi.org/10.1007/s10584-016-1849-0>

	resources for left-behind households.	
Urban Pressure	Migration to cities like Bulawayo results in overcrowding, joblessness, and strain on infrastructure, housing, and services.	Creates urban challenges, including heightened poverty, illegal activities, and social misconduct.
Reverse Migration	Urban-to-rural migration due to climate challenges adds strain on already resource-constrained rural areas.	Intensifies rural poverty and food scarcity.
Social Fragmentation	Families are split up or relocate to unfamiliar environments, leading to loss of social bonds, community disintegration, and weakened traditions.	Erodes local support networks and community cohesion.
Family Disintegration	Migration leads to long-distance separation, marital breakdowns, and domestic abuse. COVID-19 restrictions exacerbated the situation.	Causes emotional difficulties, reduced social support, and challenges to family cohesion.
Exploitation of Migrants	Migrants face exploitation, poor working conditions, and climate-related risks in informal urban settlements.	Migrants are vulnerable to unsafe environments, lack of access to services, and prejudice.

Impact on Agriculture	Out-migration leads to labour shortages, decline in cultivated land, and loss of agricultural knowledge.	Reduces food security and hampers the intergenerational transfer of farming skills.
Economic Opportunities	Financial support from migrants allows some households to invest in private boreholes, horticulture, and better housing.	Enhances household prosperity for some, but may create dependency or disparities within communities.

Source: Data generated from study participants

One key informant revealed the following.

The movement of people to neighbouring urban centres is a long-standing occurrence in this nation, dating back to the colonial period and persisting through current climatic shifts. This trend poses difficulties for municipal authorities in receiving cities. As the influx from rural to urban areas increases, it leads to increased joblessness, unlawful activities, and social misconduct in cities. Recently, an intriguing reverse trend emerged: urban dwellers relocated to rural regions. Climate change also compels some city residents to move to the countryside, which brings about its own set and also compels some city residents to move to the countryside, bringing about its own challenges. This migration places additional strain on rural areas that are already facing poverty and food scarcity.

Another participant stated the following:

Astonishingly, most households in this region have family members who have relocated to nearby urban areas or neighbouring countries, such as South Africa and Botswana, due to scarce employment opportunities. Many of these families have experienced marital breakdown, disintegration of familial bonds, and domestic abuse in some cases. The

circumstances were particularly dire during the COVID-19 pandemic when travel restrictions were in place.

Smallholder farming, the primary source of livelihood for most people, is heavily affected by outmigration. This trend, largely involving young, able-bodied individuals, has led to significant labour shortages. Many participants in group discussions and key informant interviews highlighted this challenge. However, the benefits of migration were well expressed by one key informant, as captured in the following quote:

In this ward, we observed that certain households thrived due to financial support from relatives employed in urban areas or living abroad. Evidence of this prosperity includes families installing private boreholes, initiating horticultural projects, and erecting improved dwellings. These monetary contributions have enabled some households to employ workers in agricultural tasks. I interpret this as an advancement, albeit with implications for vulnerability to poverty.

Chazovachis ⁵² supports these findings, highlighting how climate-driven migration often burdens urban areas. Migrants tend to settle in informal, overcrowded shelters that lack necessities, such as healthcare, education, and sanitation. This influx can strain existing resources, intensify job competition and exacerbate unemployment and poverty. In rural areas, the loss of labour due to migration can reduce agricultural production and worsen food insecurity. Climate-induced migration can also escalate tensions and conflicts, especially in regions with scarce resources such as land and water. In the Global South, urban migration frequently leads to the growth of informal settlements, which negatively affects the environment. Problems such as overcrowding, poor waste management, and deforestation are common, putting added pressure on local ecosystems and increasing vulnerability to climate-related challenges⁵³.

⁵² Chazovachii, B. Determinants of climate-smart agriculture dissemination strategies in Chiredzi, Zimbabwe. [2020] 5. <https://hdl.handle.net/10520/ejc-jpada-v5-n3-a9>

⁵³ Leal Filho, Walter, et al. "The influence of ecosystems services depletion to climate change adaptation efforts in Africa." *Science of the Total Environment* [2021] 779, 146414. <https://doi.org/10.1016/j.scitotenv.2021.146414>

5.4. Gender, climate-induced migration and rural livelihoods resilience

The fourth research question explored the gendered implications of the adaptation strategies employed by left-behind households in response to climate change. This study aimed to assess the viability of the adopted strategies intended to reduce vulnerability and enhance resilience, as well as their implications for gender roles and responsibilities. The findings revealed that some households left behind abandoned farming because of labor and input challenges. Certain participants indicated that draught power constraints and consecutive years of crop failure discouraged some households from continuing certain agricultural practices as they anticipated no harvest.

Some households completely abandoned farming. A review of household farming activities over the past 30 years revealed a significant reduction in farm size, with many also experiencing a sharp decline in livestock numbers due to droughts and limited grazing opportunities in the area. Climate change and the migration of economically active individuals compel households to shift toward non-farm activities. However, due to limited access to productive assets, poorer households often diversify into less profitable livelihoods than wealthier households.

Participants shared that, after their husbands migrated, rural women often took on extra roles and responsibilities, covering both farm and non-farm agricultural tasks. Many women have stepped into farm management roles to compensate for the loss of male labour, leading to a rise in female-headed households and women-managed farms. Despite this, they still maintain traditional duties such as managing the household, preparing food, and raising children. This shift in responsibilities aligns with societal norms regarding the acceptable roles of women in the home.

In this context, livestock has become increasingly important, as women take on the responsibility of animal husbandry on farms. This is especially significant in conservative societies, where it is often deemed inappropriate for women to work outside their homes. Women tend to focus on raising small animals, such as pigeons and chickens, as well as larger livestock, such as cattle. Livestock not only serves as a source of

food and income but also symbolizes status and acts as a form of savings. This provides a buffer against risk and enhances the ability to adapt. One key informant observed the following.

The migration of men from the community has reshaped traditional gender roles and responsibilities. Women are now taking on tasks traditionally carried out by men, and their visibility in the public sphere has increased significantly. Women now manage agricultural activities at home and even transport cattle to auctions—tasks rarely associated with women in patriarchal societies. Although women’s growing decision-making autonomy is vital for adapting to the effects of male migration, entrenched social norms and family structures often hinder their progress.

Participants also reported that alongside their household and farm responsibilities, women increasingly engage in off-farm jobs to generate income. These jobs include seasonal agricultural work, domestic services, and physically demanding tasks such as weeding. Women’s involvement in off-farm employment has a mixed effect on food security and adaptive capacity.

Although off-farm work reduces the time available for women to grow vegetables and care for livestock, their income is crucial for sustaining their families, with most of their earnings directed toward ensuring food security. Additionally, this type of employment helps to diversify household livelihoods, reduces reliance on remittances, and provides a cushion against agricultural uncertainties by offering alternative income sources.

However, systemic barriers and discrimination often limit women’s ability to adapt effectively. These challenges restrict access to farm resources, financial services, and trainings. Women are frequently excluded from agricultural extension services and development programs. One focus group participant summarized the situation.

Women play a critical role in ensuring their households’ food security, especially in the face of climate-induced migration. Unfortunately, national policies fail to acknowledge this role. Our extension services lack gender sensitivity and do not address the impact of climate change-induced migration in this region, which limits women’s ability to adapt effectively to these changes.

De-agrarianization has accelerated, driven by factors beyond structural adjustment and economic liberalization, such as growing opportunities for non-agricultural employment⁵⁴. The younger generations are increasingly less inclined to view family farming as a viable profession. Data on Africa's demographics, economic trends, and social changes show a declining rural population, shrinking peasant communities, and reduced commercial family farming as more people seek alternative livelihood.

Gender dynamics also significantly influences climate adaptation and migration. Female farmers in Africa often adopt fewer adaptation strategies than men, primarily due to a gender asset gap and traditional labor divisions⁵⁵. For instance, women face barriers to adopting Climate-Smart Agriculture (CSA) technologies stemming from limited access to training and resources^{56, 57}. Similarly, in Pakistan, women experience greater climate-related health challenges, economic hardships, and social barriers to agriculture, further worsening the impact on their livelihoods⁵⁸.

6.0 RECOMMENDATIONS

African communities are on the frontlines of climate change, experiencing devastating impacts of erratic weather, prolonged droughts, and land degradation. One key lesson is that climate change is no longer a distant threat; it is a present reality that reshapes lives and livelihoods.

⁵⁴ Nyathi, D., Ndlovu, J., Ndlovu, C.N. Ecosystem-Based Adaptation to Climate Change and the Potential to Build Resilient Food Systems and Achieve Food Security in Africa. In: Brears, R. (eds) The Palgrave Encyclopedia of Sustainable Resources and Ecosystem Resilience. Palgrave Macmillan, Cham. (2025). https://doi.org/10.1007/978-3-030-67776-3_62-1

⁵⁵ Hazel Velasco Palacios, Kathleen Sexsmith, Maite Matheu et al., Gendered adaptations to climate change in the Honduran coffee sector. *Women's Studies International Forum* [2023] 98, 102720. <https://doi.org/10.1016/j.wsif.2023.102720>.

⁵⁶ Huyer S. 2021. Gender-smart agriculture: An agenda for gender and socially inclusive climate-resilient agriculture. CCAFS Working Paper No.404. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

⁵⁷ Nhat Lam Duyen, T., Rañola, R. F., Sander, B. O., Wassmann, R., et al., A comparative analysis of gender and youth issues in North, Central, and South Vietnam rice production. *Climate and Development*, [2020] 13, 115. <https://doi.org/10.1080/17565529.2020.1734771>.

⁵⁸ Nosheen, M., Iqbal, J., & Ahmad, S. (2023). Economic empowerment of women through climate change mitigation. *Journal of Cleaner Production*, 421, 138480.

In regions like Lupane and Zimbabwe, agriculture is becoming increasingly unsustainable, pushing families to migrate as a survival strategy rather than out of choice. This shift suggests that migration must be understood as both a consequence of environmental stress and a potential tool for resilience. Another lesson is the dual nature of migration, which brings about both promise and pain. While remittances from migrants can be a crucial lifeline for families, migration often separates households and increases the burden on those left behind, especially on women, children, and the elderly. Women, in particular, take on expanded roles in their communities, showing extraordinary resilience, yet they remain under-resourced and under-recognized.

To this end, this research outlines several key steps to boost household resilience, safeguard vulnerable populations, and weave sustainability into national policy frameworks. First, there is a critical need to officially recognize migration as a valid adaptation strategy to climate change in Zimbabwe's national policies. Currently, migration is often viewed as a sign that rural development has failed rather than as a potential method of coping. Modifying this perception will ensure that the victims of migration are included in the development initiatives. Second, the research highlights a significant gap: there is no cohesive legal or institutional framework that connects climate change, migration, and sustainable development. The current policies in Zimbabwe—whether in the agriculture, health, housing, or environmental sectors—tend to function independently and do not fully consider how interconnected these issues are for rural households. Creating a national policy on climate migration that centers on sustainability is crucial. This policy should enhance coordination among different sectors, recognize environmental displacement, and align with both regional and global climate agreements.

Another priority is to invest in women, and marginalized groups' empowerment and leadership is not just a moral imperative; it is a practical solution for community resilience. This study shows that women, in particular, are increasingly left to manage farms and households, while men migrate. However, they face many obstacles in accessing land, financial services, farming support, and decision-making. Policies need to be gender-aware, ensuring that women have equal access to resources and leadership opportunities in adapting to climate change.

Moreover, this study revealed that young people are often the first to leave, driven by diminishing opportunities in rural areas. To counter this, policies should support vocational training, small-business development, and youth involvement in sustainable agriculture. If young people can envision the future in their local communities, they are more likely to stay. Therefore, protecting the rights and welfare of migrants is an urgent concern. Many people who move because of climate impacts, especially informally and across borders, face serious risks, including exploitation, lack of legal papers, and being shut out of essential services. Setting up local or district-level resource centers for migrants could offer them access to counselling, legal aid, healthcare, and education. The most powerful lesson is that communities often provide answers. Solutions rooted in local knowledge, led by the most affected, are more likely to succeed and endure. Listening to and empowering local voices, especially women, youth, and farmers, should be the foundation of any strategy. With inclusive and coordinated efforts, African communities can transform climate challenges into opportunities for resilience and renewal.

7.0 CONCLUSIONS

This study highlights how climate change interacts with various factors that affect rural livelihood sustainability. This reveals that household vulnerability to climatic change is exacerbated by a combination of issues, including population growth, poor urban planning, ecosystem degradation, economic hardships, social unrest, and fragile rural economies. Climate change serves as a catalyst that intensifies underlying structural vulnerabilities. The intersection of climate change and political ecological factors is particularly significant, influencing migration decisions in rural communities. Some regions experienced increased rural-to-urban migration due to climate pressure, while others observed reverse migration or even international movements. The findings suggest that migration patterns shaped by climate change are deeply intertwined with factors such as urbanization, dependence on agriculture, and socioeconomic conditions. Understanding and addressing these complexities require a multifaceted approach. Drought has been identified as the most severe climate-related threat, severely affecting livelihoods and food security. Prolonged droughts worsen these challenges, affecting all forms of livelihoods in the region. This study also

found that migration leads to changes in intra-household power dynamics, impacting the well-being and resilience of those left behind, particularly women. These shifts influence natural resource management, agricultural practices, food security, risk management decisions, and adaptation strategies at both household and community levels.

Migration has emerged as an adaptation strategy to climate change, forming part of the coping mechanisms of broader households. Migration offers the opportunity to diversify income, reduce vulnerability, and improve resilience. However, poor households that receive minimal remittances often remain trapped in poverty. This indicates that vulnerable households use migration to address both climate-related and non-climatic risks. However, migration carries inherent risk. If it fails to strengthen household resilience or increase migrants' vulnerability in their new locations, migration can become a harmful strategy. This underscores the need for coherent policies and institutional collaboration to recognize and support the role of migration in climate adaptation. Governments and policymakers must work to enhance people's adaptive capacity, ensuring that migration is one of several viable options. Policies should support migrant households by providing access to social services, healthcare and education. Initiatives such as livelihood training programs and migrant resource centers could help address the social and economic challenges migrants face and improve their overall wellbeing.

Despite the growing recognition of climate-induced migration, Zimbabwe still lacks a comprehensive national climate change migration policy. Such a policy could address the root causes of migration, promote sustainable development, and prioritize the needs and rights of migrant households and communities. Involving migrant households in the decision-making processes is crucial for creating inclusive strategies. Community-based programs can provide psychosocial support and counselling services to migrant households, especially for women and children. These initiatives would help address migrants' emotional and psychological challenges and offer safe spaces for migrants to share experiences, build social networks, and access assistance. Governments and development partners should invest in climate-resilient infrastructure such as irrigation and water collection systems to promote sustainable agriculture and livelihoods. This investment can improve

livelihoods, enhance well-being, and reduce vulnerability to climate-related stressors. Recognizing migration as a valid adaptation strategy and empowerment.

7.1. Further Research

Further research is essential to examine the long-term impact of migration on household resilience, well-being, and the effectiveness of adaptation strategies. This would help to identify best practices, inform policies, and ensure that the needs and rights of migrant households are addressed. There is also a need to explore how gradual environmental changes influence migration patterns and how slow-onset events interact with other factors that drive migration. Future studies should investigate the role of internal migration and associated social and financial remittances in building adaptive capacity. Although internal migration involves more people than international migration does, systematic data on internal remittances are lacking. Internal migrants often come from poorer households or marginalized groups such as women, minority ethnic groups, or landless families. Research in this area will provide valuable insights into supporting these vulnerable groups and ensuring equitable adaptation strategies.