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RESEARCH ARTICLE

Navigating planetary human entanglements
through climate change-induced human
mobility in Zimbabwe: An Afrocentric
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Abstract

The central question of the 21st century revolves around increasing human entanglement. Humans are finding it increasingly difficult to survive in the changing environment caused by climate-induced disasters such as floods, droughts, storms, and heat waves. In Zimbabwe, this has led to the emergence of human mobility as an adaptation strategy, with individuals (indigenous and local) relocating to areas offering more favorable economic and environmental conditions. This study employed Afrocentric theoretical lenses to describe how both slow and sudden-onset climatic catastrophic events have affected the agro-economic livelihoods of the indigenous Ndau people, forcing them to seek better living conditions and safety. As an Afrocentric study, this research examines how historical and cultural factors influence the Ndau people's mobility decisions. It employed the philosophical sagacity interview method and talking cycles to collect data from seven wards in Chimanimani, Zimbabwe. The findings reveal that the impacts of climate change – both gradual and abrupt – have increased in frequency, intensity, duration, and location. The Ndau people have suffered frequent cyclones, storms, and heavy rainfall, leading to landslides and floods. These conditions have driven both short-term and long-term climate-induced mobility. Individuals moved locally and regionally to find livelihood opportunities and their decisions were most influenced by historical and cultural ties through kinship. The study advocates for enhancing communities' preparedness and adaptability to reduce vulnerabilities. It highlights the importance of strong governance, resilience strategies, environmental protections, economic diversification, and social support to mitigate disasters; prevent unwanted displacement; and manage emigration. Furthermore, European narratives often dominate discussions of African climate-related agro-migration, even though most of these migrants move within their own countries and regions. As a consequence, this study aims to amplify African narratives on human mobility and climate change adaptation.

Keywords: Climate change; Mobility; Adaptation; Afrocentricity; Migration; Africa

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1. Introduction

The central question of the 21st century revolves around increasing human entanglement (Moyo & Ndlovu-Gatsheni, 2022). Humans are increasingly struggling to survive

in changing environments caused by climate-induced disasters such as floods, droughts, storms, and heat waves. As a result, human mobility has emerged as an adaptation strategy to climate change for both indigenous and local people in Zimbabwe (Maganga & Suso, 2022; Oakes *et al.*, 2020). This shift has prompted individuals to relocate to areas with more favorable economic and environmental conditions (Locke, 2009; Nyahunda *et al.*, 2021), which aligns with the notion that climate change impacts are global, with sub-Saharan Africa being one of the most severely affected regions (Serdeczny *et al.*, 2017). The negative effects of climate change have led to increased migration in Africa, driven by both gradual and sudden-onset events such as desertification, deforestation, rising sea levels, droughts, water scarcity, and floods. Over the past few decades, these events have intensified in frequency and severity. By 2050, climate change is projected to prompt 1.2 million people to move across national borders within the African continent (Leal Filho *et al.*, 2022; Simpson & Rosengaertner, 2023). This represents 10% of all cross-border migrations but is only a small fraction of the expected climate migration in Africa (Amakrane *et al.*, 2023). In the next 30 years, up to 5% of Africa's population, potentially 113 million people could be displaced within their home countries due to climate impacts (Amakrane *et al.*, 2023; Simpson & Rosengaertner, 2023). Most climate-related human mobility occurs within countries or between neighboring countries rather than toward distant high-income countries (International Organization for Migration, 2022). In 2021 alone, the Internal Displacement Monitoring Centre reported 2.6 million new internal displacements in sub-Saharan Africa due to disasters (International Organization for Migration [IOM], 2022). The World Bank's Groundswell Report II projects that, without significant climate and development interventions, climate change could contribute to the migration of more than 105 million people within their own countries in Africa due to water stress, reduced crop productivity, and rising sea levels (World Bank, 2021).

This study uses two Afrocentric tenets – historicity and culture – to trace how climate change and climate-related disasters have jeopardized the agro-lives of people in Chimanimani, Zimbabwe, leading to internal and regional migration. To understand the current patterns of African migration, it is crucial to explore its historical context. Human mobility in Africa has a long history and is a key driver for the resilience of communities (Nyahunda *et al.*, 2021). As part of the 2063 African Union (AU) Agenda and the Global Compact for Migration objectives, there is now recognition that migration can become a development enabler, a strategy to improve sustainable livelihoods and a way to adapt to environmental pressures and climate

change (IOM, 2022). The Intergovernmental Panel on Climate Change (IPCC) (2018) has highlighted that migration is an important and potentially effective climate change adaptation strategy in Africa and is considered in adaptation planning. Similarly, the recently launched AU Climate Change and Resilient Development Strategy and Action Plan (2022 – 2032) acknowledges that movement or migration is an adaptation strategy employed by hundreds of millions of people, both in response to negative stimuli and as a means of seeking a better life, and that there may be a considerable role for governments in normalizing and facilitating the movement of people (United Nations Economic Commission for Africa, 2022).

Zimbabwe is used as a case study to explain climate-induced migration in Southern Africa. The country has long been affected by climate change, with impacts manifesting through droughts, erratic temperatures, floods, cyclones, heat waves, wildfires, water source desiccation, and the spread of disease-causing pathogens (Bhatasara, 2015; Muchena & Iglesias, 1995; Nyahunda & Tirivangasi, 2021a; Unganai, 1996). Meteorological records show that Zimbabwe is already experiencing climate variations (Dube & Phiri, 2013; Gwatida *et al.*, 2023). For instance, an increase in average temperatures by 2°C is projected to reduce Zimbabwe's wetlands from 9% to 2.5%, while a 4°C rise would reduce the summer water surplus zones to <2% (Manyeruke *et al.*, 2013). The climate variation reports reveal that droughts occurred every 10 years during the 1960s, 1970s, and 1980s. However, the frequency of droughts and dry spells has increased to every 4 – 5 years, and by the late 1990s, they were occurring every 3 years. Since 2000, the situation has worsened, with successive droughts impacting the country in 2002 – 2003, 2004 – 2005, and 2007 – 2008 (Manyeruke *et al.*, 2013).

A recent study by Afrobarometer notes that every six in 10 Zimbabweans report experiencing worsening droughts, highlighting the urgent need for government action. In response, the Zimbabwean government has declared a national disaster due to the impact of these droughts on farming activities. With millions facing hunger, there is an urgent call for over US\$2 billion in aid to ensure sufficient food supplies (Afrobarometer, 2024). The latest Afrobarometer survey in Zimbabwe, conducted in 2022, indicates that the proportion of citizens experiencing more severe droughts has almost doubled since 2017. While climate change is still an unknown concept to more than half of Zimbabweans, those who are aware of it overwhelmingly report that climate change is worsening their lives (Afrobarometer, 2024).

The country is projected to experience a progressive reduction in precipitation, rising temperatures, more

volatile weather events, and increasingly unpredictable seasons (Government of Zimbabwe, 2022). In terms of human mobility and climate change, Zimbabwe is likely to be affected in several ways. First, there has been an increase in people moving out of the country, with personal remittances received in Zimbabwe accounting for 8% of the total GDP. However, the government noted that the direct impacts of climate change in the host country of the migrant worker (e.g., South Africa) may lead to economic disruptions for those receiving remittances and the macro-economy (Government of Zimbabwe, 2022). Second, the country depends on imported cereals. Zimbabwe has a negative trade balance for food products. Being dependent on food imports from abroad, Zimbabwe is exposed to climate-related disruptions in the availability, price, or quality of food products. Third, Zimbabwe currently hosts 9000 refugees. Although its net migration rate is negative (there is more emigration than immigration), the number of refugees has doubled since 2010, which may be a consequence of slow-onset migration due to ecosystem degradation or major environmental events. Climate impacts in other countries may lead to an increase in push factors to emigrate to Zimbabwe (Government of Zimbabwe, 2022).

Despite this, only a scant amount of scientific literature exists concerning the impact of climate change on human mobility in Zimbabwe. As such, this study seeks to fill that gap. The paper will begin by explaining the theoretical position on how climate change and climate-related disasters influence people in Zimbabwe, resulting in internal and regional migration. The second section will discuss climate-induced human mobility in Southern Africa. The third section will discuss the methodology, followed by the fourth section, which will present and discuss the results related to short- and long-term human mobility in Zimbabwe. The paper will conclude with a summary of the findings.

1.1. Afrocentric theoretical position on human mobility and climate change

This paper started by addressing a theoretical void in the field of social, vulnerability, resilience, and adaptation (SVRA) studies. According to a study conducted by Kuhlicke *et al.* (2023), a significant proportion of research papers in the fields of psychology, sociology, geography, and mathematics that investigate various natural hazards such as floods, droughts, landslides, storm surges, wildfires, tsunamis, storms, and volcano eruptions does not explicitly incorporate theoretical frameworks in their investigations. Significantly, the use of SVRA and its associated principles is employed to effectively mitigate the risks posed by natural hazards and facilitate the process

of adapting to climate change. The researcher employed the Afrocentric theoretical framework to examine the phenomenon of climate-induced mobility of people in Zimbabwe, a nation located in southern Africa and sharing borders with Mozambique, South Africa, and Zambia. The concept of Afrocentricity emerged as a theoretical framework for understanding knowledge in the year 1980, originating from the philosophical ideas of Molefi Kete Asante. According to Asante (2003), Afrocentricity is characterized as a cognitive framework and behavioral approach that prioritizes African interests, values, and views. To accomplish this objective, Afrocentricity theory relies on the notion of *Njia*, which is delineated as the communal manifestation of the Afrocentric perspective rooted in the historical encounters of individuals of African descent (Asante, 2003). The Afrocentric theory acknowledges the imperative of scrutinizing the cultures and histories of Africa from their respective centers or geographical contexts. In summary, according to Asante (1990), the theory asserts that African individuals are proactive, fundamental, and key actors in shaping their historical narratives. The idea is situated within the context of the African experience. Specifically, Afrocentrists argue that individuals of African descent, similar to individuals of other racial backgrounds, frequently engage in questioning various aspects of life. When faced with challenging problems, individuals tend to have a natural inclination to inquire and seek resolutions.

According to Hunter (1983), Afrocentricity is proposed as a theoretical framework aimed at effecting social transformation, specifically targeting black individuals residing on both the African continent and the diaspora. The imperative is for individuals of African descent to cultivate a robust sense of self, historical awareness, and cultural appreciation to effectively address the challenges that persist in their contemporary and future circumstances. In the present era, individuals of African descent are confronted with inquiries concerning the phenomenon of climate change and its impact on human migration within the African continent. In addressing these two global concerns, an Afrocentric scientist, akin to a traditional African healer who protects society from malevolent influences, analyzes prevailing situations, identifies potential avenues for resolution, and proposes strategies for resolution. The Afrocentrist focuses on collecting factual information, verifying data, and rigorously examining interpretations of both individuals and subjects in the study of human behavior (Asante, 2002).

In the context of the current period characterized by climate change and its detrimental impacts on both

human beings and the natural world, the process of de-emphasizing indigenous knowledge systems presents noteworthy perspectives for effectively addressing sustainable transformation and fostering resilience that aligns with cultural norms and ecological rejuvenation. Climate change adaptation programs that are centered on Africa place indigenous peoples within the context of their social, spiritual, and cultural frameworks. Nyong *et al.* (2007) note that the production of Afrocentric indigenous knowledge is important not only for building inclusive resilience but also for promoting alternative Afrocentric epistemologies for understanding and making sense of our global reality. In this particular instance, the utilization of Afrocentric theory serves to offer a perspective on the phenomenon of climate-induced human movement in Zimbabwe. The determinations of human migration are shaped by the collective historical and cultural experiences of indigenous populations. The occurrence of climatic disasters, whether they manifest gradually or abruptly, can have a significant impact on the various drivers of migration, including social, cultural, political, and economic factors. As a result, the capacity of individuals to engage in movement may change. The effects of climate change worsen and hasten these factors in intricate ways. An increasing number of individuals may find themselves lacking the necessary resources to engage in migration, resulting in their immobility or confinement in hazardous situations. Some individuals may feel forced to engage in more frequent, extensive, or permanent migration to access natural resources and secure economic opportunities.

The Afrocentric principles, specifically historicity and culture, are utilized throughout the paper to elucidate the factors that contribute to climate-induced migration. Afrocentricity affirms, rejuvenates, establishes, and sustains the existence and experiences of African individuals and communities concerning climate change and human mobility in this context.

1.2. Climate-induced mobilities in Southern Africa

The researcher applied the Afrocentricity tenet of historicity to dig relevant literature on climate-induced mobility in Africa to obtain insight into how climate change has affected people's mobility decisions. Africa is one of the most vulnerable regions to climate change and climate variability due to its vast semi-arid areas, high reliance on rainfed agriculture (only 5% of the cultivated area is under irrigation, compared to the global average of 21%), and low adaptive capacity (FAO, 2016; Tirivangasi *et al.*, 2021b). Due to its high vulnerability, Africa will be more impacted by climate change than affluent nations and regions and those located at higher latitudes (Guillaumont & Simonet, 2011).

Most of Southern Africa is classified as a semi-arid region with a high spatial variation in precipitation. However, climatic conditions range from extremely arid regions in the southwest to humid subtropical regions in the northeast (Spear *et al.*, 2015). In its most recent report, the IPCC disclosed that the Southern African Development Community region had experienced an increase in average temperature over the past several decades. During the same time frame, it has experienced below-average precipitation and variations in the onset, cessation, and intensity of rainfall. In addition, Southern Africa has experienced an increase in extreme rainfall events and the frequency of dry periods, resulting in more severe droughts (IPCC, 2014; Jury, 2013). Forecasts indicate that more variable precipitation and a rise in the frequency and severity of extreme events such as droughts and floods can be anticipated in the future (IPCC, 2014). Consequently, climate change has increased the mobility of people in Southern Africa. Mobility is essential for people to adapt to and contend with increasingly severe climate impacts. Historically, millions of individuals, families, and entire communities have utilized relocation as a coping mechanism for climatic events and stresses. This is especially true for farmers and pastoralists, whose livelihoods rely significantly on natural resources that have been impacted by climate change. In light of this, climate mobility refers to the movement of individuals in response to abrupt or gradual climate impacts. It occurs within and across national borders; involves varying degrees of constraints, agency, and vulnerability; and includes both forced displacement and migration and voluntary relocation. Climate mobility can be temporary, recurrent, or permanent and occurs over various distances.

Pastoralists in north-western and north-central Namibia and the Kalahari Desert of Botswana have employed seasonal migration as a coping strategy in response to rainfall variability in Botswana and Namibia. Due to the arid climate, sandy soils, and savannah ecosystems, pastoral agriculture and livestock husbandry are the primary sources of income (Spear *et al.*, 2015). In the arid Kunene region of north-western Namibia, Ovahimba cattle farmers frequently relocate their livestock in quest of better grazing. In addition, pastoralists in the Kalahari region of Botswana use livestock mobility to respond to variable precipitation (World Bank, 2013). Temporary migration as a means of subsistence is an essential characteristic of these pastoralists and exemplifies an effective survival strategy. Zimbabwe, Mozambique, Namibia, and South Africa were affected by the El Niño climate cycle, which decreased precipitation and increased temperatures in Southern Africa (Bilak *et al.*, 2016). El Niño is frequently accompanied by the opposite weather

phenomenon, El Niño, which develops later in the climate cycle and brings significant precipitation to the same regions severely impacted by El Niño. Flooding is a typical consequence (United Nations Office for the Coordination of Humanitarian Affairs, 2016). Mozambique, Namibia, and Zimbabwe experienced severe flooding in 2017 as a result of El Niño-induced drought in Southern Africa as well as tropical cyclones Dineo and Idai (Tirivangasi *et al.*, 2021b). This has resulted in the displacement of thousands of individuals.

In addition, significant portions of Southern Africa's arid and semi-arid regions are prone to and have recently experienced severe droughts (Tirivangasi, 2018). This has significant effects on both food and water security. The severe drought in Southern Africa has resulted in millions of people experiencing extreme starvation (Sengupta & Andreoni, 2024). The El Niño-induced calamity is causing severe devastation in communities across multiple countries, destroying crops and livestock, and causing a significant increase in food costs. Approximately 20 million individuals in southern Africa are currently experiencing what the United Nations refer to as acute hunger, resulting from one of the most severe droughts in over 40 years. The phenomenon causes crops to wither, devastates cattle populations and, following a prolonged period of elevated food costs due to pandemics and conflicts, significantly increases the cost of corn, which is the primary agricultural product in the area. In 2024, Malawi, Zambia, and Zimbabwe have each officially proclaimed a state of national emergency. The citation is from Sengupta and Andreoni's work published in 2024. The IPCC Special Report on Global Warming of 1.5°C (Hoegh-Guldberg *et al.*, 2018) designated Southern Africa as a region very vulnerable to the impacts of climate change. The region has water stress as a result of natural droughts, an increasing population, and the industrial aspirations of an emerging economy. This is compounded by the region's warm temperature and distinct wet-dry seasonal patterns (Rouault *et al.*, 2024). Under low mitigation emission scenarios, Southern Africa would probably experience significant increases in temperature and a high possibility of decreased rainfall (Hoegh-Guldberg *et al.*, 2018; Lee *et al.*, 2021). This justifies its classification as a climate change hotspot since the ability to adapt to these changes will be severely constrained.

2. Methods

This study is grounded in the theoretical framework of Afrocentricity. The ethos of Afrocentricity means "placing African ideals at the center of any analysis that involves African culture and behavior" (Asante, 1998, p. 2). It

would be inconsistent and a lack of ingenuity to use Afrocentricity as a theoretical perspective and then select a non-Afrocentric research methodology. In selecting the methodology for this study, the researchers focused on congruence, ensuring that the theoretical perspective, epistemology, and methodological tools were fully aligned. This study adopted an Afrocentric methodology to answer the research question on climate-induced mobility in Chimanimani, Zimbabwe. Asante (1990) identifies three main positive aspects of an Afrocentric methodology. First, it recognizes cultural pluralism without pursuing any hegemony over other methods. Instead, it emphasizes grounding the study of African phenomena and events in the cultural voice of the African people. It advocates for cultural immersion, the indigenization of investigative tools and methods, and the interpretation of research data from an indigenous African perspective. While it does not claim supremacy nor reject other methods, it advocates for challenging and reassessing these methods. Asante notes, "The Afrocentric methodology rejects the notion that a certain discipline has all the tools needed to analyze phenomena. However, it stresses that these methods should be challenged" (Asante, 1990, p. 31).

The second positive facet of an Afrocentric methodology is its comprehensive approach, encompassing all aspects of life. It pays attention to the social, historical, cultural, political, economic, and psychological spheres of life. In that, it allows researchers to investigate any field of their choice from an Afrocentric perspective. For instance, in our study of climate change, one needs to understand the role played by communal beliefs in various ways. A researcher must demonstrate an understanding of the African beliefs on how to adapt to the adverse effects of climate change. The final positive aspect addresses epistemological issues, including language, myths, dance, music, and art. These elements reveal the African experience to the whole world. The researcher must be familiar with the history, language, philosophy, and myths of the people being researched. Without cultural immersion, researchers risk losing ethical values and may end up conducting research devoid of meaningful context (Asante, 1990).

Given the characteristics of Afrocentric research methodology, it is the most suitable approach for examining community perceptions of climate change and its impact on human mobility in Zimbabwe. As noted in the following sections, the Ndau people are an indigenous group in Zimbabwe with distinct cultural practices and traditions. In this Afrocentric research, importance is placed on the customs, beliefs, motifs, and values of African people. This focus on African cultural elements forms the basis for applying an African methodology.

2.1. The research site

This study was conducted in Chimanimani District, located in the southeastern highlands of Manicaland, Zimbabwe. The region is predominantly inhabited by the Ndaou people, an indigenous group. As an Afrocentric study, the researchers utilized historicity and culture to understand how the Ndaou people perceive and adapt to the impacts of climate change in Zimbabwe. Through the utilization of the Afrocentric tenets, one can understand the people, language, cosmologies, kinship system, cultural practices, and religion. "Location, as a core element of the Afrocentric functional paradigm, serves as a pivotal research tenet, providing a foundation for examining the cultural, philosophical, and historical aspects of human expression, collectively understood as culture (Monteiro-Ferreira, 2010, p. 44)."

The researcher traces the history of the Ndaou people from their original settlement to the present. By highlighting and describing who they are as people, their language, cosmic beliefs, kinship system, cultural practices, and religion, the study distinguishes the Ndaou as a unique indigenous group within the larger Shona community. Although the Shona people are also indigenous, the Ndaou have been marginalized and often viewed as part of the broader Shona group. To understand their experiences of climate change accurately, it is essential to consider their distinct perspectives. The Chimanimani area is also inhabited by other people who do not belong to the Ndaou-speaking clan; this is due to resettlement programs, employment, and marriage issues that influence internal migration in the region. This study will not include individuals from other ethnic groups, as they are not Ndaou natives. Instead, the focus will be on the indigenous Ndaou people of the district, most of whom reside in rural areas.

The origins of the Ndaou people are complex and lack a singular explanation, as current genealogies were documented by anthropologists and historians who are not Ndaou descendants (Hlatshwayo, 2017). The history and the genealogy of the Ndaou can be traced back to the Bantu-speaking people of West Africa, approximately 4000 years ago. This implies that the Ndaou have not always been in Chimanimani. Instead, like other tribes of Southern Africa, they migrated as Bantu people from West Africa. The Ndaou are related to Hungwe and Rozvi groups that invaded pre-colonial Zimbabwe. The Hungwe were the earliest Bantu people to settle in the current Zimbabwe, arriving around 700 – 800 AD. The Hungwe lineage is identified by the totems named after the birds and aquatic animals. The association with water was an attribution to their greatest ancestor, *Dzivaguru*, which means the great pool. Other totems from the members of the Hungwe

family are *Garwe* or *Ngwena* (crocodile), *Bonga* or *Mvuuvu* (hippo), and *Mheta* (water python). These totems are also found among the Ndaou people, supporting the notion that the Ndaou are indeed Bantu in origin.

The Ndaou people, like other African groups, are highly religious people who believe in God, popularly known as *Mwari*, the supreme being (Mapuranga, 2010). The Ndaou people perceived religion as their way of creating and maintaining their relationship with their God through their ancestors (Mtapuri & Mazengwa, 2013). As a form of worship, the Ndaou people perform ceremonies to appease the ancestral and territorial spirits. The Ndaou people and other Zimbabwean indigenous people believe that the spirits have a great influence on their well-being. They believe that the dead are in a state of consciousness, such that they can intervene in human affairs. It is believed that the ancestors can influence a lot of things in people's lives, ranging from fertility, rain, good health, and protection from physical and mystical danger to curing illness. The Ndaou people believed serious misfortunes, such as prolonged sickness, death, lack of rain, or persistent ravaging of fields by wild animals, demanded extraordinary solutions, even when the cause of death or sickness was because of external influences. The Ndaou would consult spirit mediums when a bad misfortune had happened. They would perform the ritual ceremonies to appease these spirits.

The Ndaou indigenous cultural beliefs, practices, and knowledge systems can be a solution to climatic problems related to climate change. The Ndaou respect the water bodies and forest resources as they believe that they are sacred places inhabited by spiritual forces. Taringa (2006) believed that the respect instigated by the indigenous African religion toward the water bodies and forest resources is due to the fear of the wrath of ancestral spirits, who are the custodians of the environment. The Ndaou people view climate change through a religious sociocultural and religious perspective. Taringa (2006) notes that for the Ndaou people, behind the physical environment lie some ancestral and territorial spirits that govern how humanity deals with fauna and flora. It is through the Afrocentric perspective that this study will be able to understand the changing climate and its impact on health and adaptation practices. It is through the Afrocentric historicity and cultural lenses that this study investigated the influence of climate-induced disasters on Ndaou people's mobility decisions.

Geographically, Chimanimani district (where the Ndaou people are located), as shown in Figure 1, is one of the regions that receive rainfall of up to 1400 mm per year (Chingombe & Musarandega, 2021), and most of the specialized crops are grown in this place. The farmers in the area grow crops such as potatoes, bananas, mangoes,

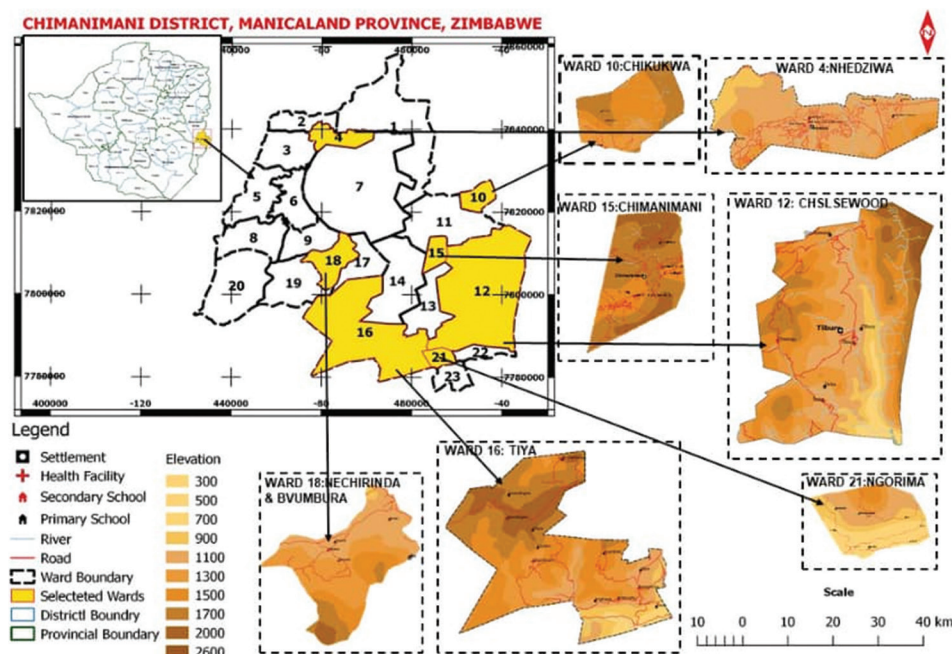


Figure 1. Study area in Chimanimani, Manicaland Province of Zimbabwe
Source: Elevation data provided by Geoanalytics and Allied Services, Zimbabwe.

sugarcane, and maize production, and plantations focus on tea, coffee, and timber. According to Mutandwa *et al.* (2019), the district has a total area of 3450.14 square kilometers and a population of approximately 134,939. It is the smallest district in Manicaland, with high, rugged terrain rising to 600 m above the sea level. The district, which consists of 23 wards and is mainly rural, as noted above, relies heavily on farming for livelihoods. The region, like most other areas in Southern Africa, has been affected by climate change, which disturbed its ecosystem. The area is prone to tropical cyclones as it lies in the overland path of the cyclones from Mozambique and the Indian Ocean (Department of Civil Protection, 2013). The topography is extremely rugged, with ranges of peaks and ravines that cause resistance to the movement of tropical cyclones. The region has recently suffered from the effects of Cyclone Idai; on March 15, 2019, Chimanimani and eight other districts experienced unprecedented destruction of property, human life, and the general way of life (Government of Zimbabwe, 2016). Settlements were destroyed, and roads and communication were rendered useless as the infrastructure suffered huge damage. The impact of the cyclone was mostly attributed to the moving landslides.

2.2. Selection of interview participants and data collection

Chimanimani district was identified as the study population, and seven wards were purposefully selected:

Ward 10 (Chikukwa), Ward 4 (Nhedziwa), Ward 12 (Charleswood), Ward 15 (Chimanimani), Ward 16 (Tiya), Ward 18 (Nechirinda and Bvumbura), and Ward 21 (Ngorima), as shown in Figure 1. The researcher's utilized criterion purposive sampling to select participants, which allows for the use of judgment in selecting key informants. The Afrocentric protagonist Pellerin (2012) argues that Afrocentric researchers must remain aware of the agency of African people and must take care to involve a proportionate sample size. The researcher purposively selected seven village heads (*Sabhuku*), four senior non-governmental organizations (NGO) officers working on resilience, and 84 community household heads, resulting in a total of 95 participants.

The researcher employed the philosophical sagacity interview method. This is an indigenous interview method that engages the wisdom and traditions of people (Emagalit, 2001). From this perspective, the theory of knowledge and questions about knowledge can be found in the wisdom and beliefs of wise elders of the communities who have not been schooled in the formal education system (Kaphagawani & Malherbe, 2000). This is an important epistemological assumption, given that most post-colonial Indigenous thought systems have not been documented. Methods based on philosophical sagacity enable researchers to consult a large body of knowledge from the sages that are not available in the written literature. Mkabela (2005) describes these sages as elders and members of cultural

committees and suggests that they should be included in the research process. Weber-Pillwax (2001) adds that the sages, the elders, members of cultural committees, or any identified key informant should play an important role in critiquing the written literature about research. In this study, the sages are chosen as the key informants; these include seven village heads and two senior NGO officers working on resilience. These are the custodians of knowledge among the Ndaу people in Chimanimani. The philosophical sagacity interview method was used to gather the perceptions of these groups on climate change and indigenous adaptation practices in all seven wards of Chimanimani selected for this study.

Second, the researcher adopted talking cycles, also known as the conversational or discursive method (Mthembu, 2021). This approach is similar to Western focus group discussions. One of the disadvantages of the Western-based focus group interview technique is that members do not necessarily have equal opportunity to be heard. Talking circles are based on the idea of participants' respect for each other and are an example of a focus group method derived from post-colonial Indigenous worldviews. In African contexts and among indigenous peoples, there are many occasions when people form a circle. It could be around the fireplace, during celebrations when they form circles to sing, or in games when children form circles to play (Mthembu, 2011). On each of these occasions, a person is given a chance to speak uninterrupted. This method symbolizes and encourages the sharing of ideas, mutual respect, togetherness, and ongoing compassion and love for one another. The circle also symbolizes the equality of members in the circle. A common practice in talking circles is that a sacred object, a feather, a shield, a stone, a basket, or a spoon is passed around from speaker to speaker. This method was used to collect data among the community household heads. Three groups consisting of six family heads per group were divided equally among the two genders. During the group conversations, the researcher gathered historical and cultural narratives on climate change adaptation and the perception of community members on the changing climate. The researcher and his team of assistants organized two talking cycles that were held in each ward, and a total of 84 participants participated in the study. Data were collected until saturation was reached, a situation whereby the same themes kept recurring with no further new data emerging.

2.3. Data analysis

Data analysis was based on reflexive thematic content analysis with an Afrocentric perspective on the data material. An Afrocentric scholar, Pellerin (2012) notes that data processing should be conducted without

compromising the integrity of the data. The researcher must avoid distorting data and placing negative values on different aspects of African culture and life. The sorting and coding process must maintain the original Africanism displayed during the observational phase. This simply implies that the cultures, motifs, traditions, histories, ideas, languages, and experiences of African people must inform the coding process; non-African-aligned standards of data processing can seriously retard the data scheme and can result in the corruption of the research. This understanding allowed the researcher to look for latent meanings and contextual interpretations (Braun & Clarke, 2021). The analysis was conducted according to the steps described by Terry *et al.* (2017). The analytic process began during the data collection as the researcher was posing research questions to participants. For instance, the researcher wanted to understand how participants perceive the changing climate and how they are adapting to it. Second, after gathering data through recorded transcripts, the researcher moved back and forth between discussions with researcher assistants and a close examination of the findings in an iterative process (Patton, 2014). The researchers, as they discussed the themes, were cognizant of Braun & Clarke's (2012) criteria, which include (i) having a singular focus, (ii) avoiding overlap but maintaining connection, and (iii) they were directly addressing the research question. The researcher was successful in meeting Braun & Clarke's (2012) criteria, as after writing the draft paper, peer debriefing was used to ensure trustworthiness; in this case, the themes were discussed and reviewed by other colleagues. In line with the Afrocentric approach, reflexive thematic analysis requires self-reflection on how our background influences our understanding of the results (Braun & Clarke, 2021). As a Zimbabwean, the researcher understood the context and interpretation of the indigenous knowledge utilized by the Ndaу people to adapt to climate change. This enabled the researcher to make follow-ups and get clarity on the knowledge shared. The researcher was able to reflexively develop and make meaning of the data and report indigenous seasonal predictors, which are important for climate change adaptation in Chimanimani, Zimbabwe.

3. Results

Through data analysis during and after fieldwork, the research understood that human mobility was used as an adaptation mechanism by the Ndaу people in response to climate change-induced disasters. Hence, in this section, the study discussed climate-induced human mobility in Chimanimani in Zimbabwe as explained from an Afrocentric narrative gained from the fieldwork conducted. These data are discussed with existing literature

in Zimbabwe. The emerging data were grouped into themes. The researcher used the two Afrocentric tenets – historicity and culture – to explain the decision-making process by the Ndaou people concerning mobility in their community.

3.1. Community perceptions on the impact of climate change-related disasters in Chimanimani

The researcher observed from field data that the Chimanimani people are susceptible to both sudden and gradual climate change-induced catastrophes, such as cyclones, storms, and heavy precipitation, which can lead to landslides and floods. These events result in various forms of human displacement in the area. The research assistants and the researcher visited two communities severely impacted by Cyclone Idai: Kopa and Ngangu. More than 80 households were destroyed, over 300 individuals remained missing, and an estimated 270,000 individuals were displaced, according to non-governmental organizations operating in the area (Tirivangasi *et al.*, 2021b). Talking-cycle discussions were successfully conducted by the researcher at both Chikukwa and Ngangu. To initiate this investigation, the researcher questioned the participants regarding their perspectives on climate change, personal encounters with climatic events that transpired in the region, and their corresponding reactions. Many participants recounted their experiences with Cyclone Idai with deep sorrow, noting how the disaster had significantly impacted their lives. Several participants expressed their views regarding the cyclone and its impact.

“There were dead people all over, and individuals were weeping for various reasons. Some were bereft because they had been separated from their families, while others had been bereaved of relatives. We had to assist everyone we could. Although help arrived very late, we had already begun assisting one another to stay alive before help from the government arrived.” (Participant A24, community member, male, talking cycles, Ngangu village, Chimanimani).

Another participant added:

“After their residences were severely damaged or destroyed, many people were left without shelter. Hotels and institutions were converted into makeshift shelters. Others stayed in empty businesses or with relatives and friends whose homes were unaffected by the catastrophe, while I was accepted at a local hotel and later moved to my friend’s place. “I am the only surviving member of my family.” Why should it be me? I never cease to ponder. After, it had been raining consistently on March 14, 2019, I could only hear sounds. I was both perplexed and horrified

when I awoke to find myself surrounded by water that was pouring into the room. My home was reduced to rubble in one night, and there were numerous reports of missing persons the following morning. The incidents were extremely distressing to endure. I could only offer whatever assistance I could summon as a young person then.” (Participant A17, community member, male, talking cycles, Kopa, Chimanimani).

The historical narratives provided by the participants reveal that people experienced both physically and emotionally suffering. The occurrence of the cyclone made many people relocate to other areas such as Machongwe, Chitsa, Chikukwa, and other surrounding areas less prone to disaster. In addition, people began to heed the warnings of the extension officers and other community leaders about the changing climate. Before the occurrence of the catastrophic cyclone Idai, people negated advice to move from their birthplace to safer areas. The participants noted that the catastrophic situation they found themselves in was a result of the failure in land distribution in the area. In its colonial times, good fertile and arable land was taken by forestry companies and white farmers in the area, and then post-colonial district politics resulted in people living where they were (Spiegel *et al.*, 2023). A township was built in low-lying areas, while others settled in areas below the mountains. An elderly participant remarked, “*Rwizi harukanganwe parwakafamba napo*,” which translates to, “A river does not forget where it flowed before.” Despite warnings to move away from the low-lying areas, town planners did not heed these concerns. Although most people no longer follow cultural beliefs, the Ndaou people are well attached to their environment. This has made it difficult for some to see the changing environment as dangerous to them. However, following Cyclone Idai, some affected individuals were relocated, while others moved independently to safer locations, leaving some still desperate for permanent shelter and the resumption of livelihoods (Mudombi, 2019). Often during the discussions, the participants mentioned that the occurrence of the heavy destructive rain was due to the people’s failure to appease gods using traditional means. In the past, three chiefs would go to the community’s sacred place to appease gods and perform necessary rituals. However, this has not been happening. This revealed that the Ndaou people are religious people, and once they used to uphold their African religious beliefs, and this prevented them from catastrophic events like climate-induced disasters, that is, droughts, cyclones, or floods (Gwimbi, 2009). Despite the visible changes in climate, there was hope from all the participants who participated.

The following sections discuss the short- and long-term mobility patterns that emanated as a result of climate-related disasters such as tropical Cyclone Idai,

severe tropical storm Chalane, storm Eloise, and droughts that affected a large number of people since Zimbabwe attained its independence in 1980. The results reveal that Cyclone Idai triggered the population movement in the Chimanimani area as it caused widespread destruction of homes, agriculture yields, infrastructure, and sources of income for the indigenous people. These results were collaborated by studies that reveal that migration is increasingly becoming an adaptation strategy in the context of climate change (Mupesa, 2023; Nyahunda & Tirivangasi, 2021a).

3.2. Short-term human mobility patterns in Chimanimani

In the immediate aftermath of the cyclone, participants revealed that people from the most affected areas such as Ndima, Ngangu, and Kopa led to the massive outward migration of people to establish their businesses and their livelihoods in closer villages, and some went as far as Chipinge, Mutare, and Chimanimani compared to other growth points. The observations by the participants were not wrong, as the survey carried out by IOM (2020) in three of the affected villages revealed that everyone managed to return to their original homes in two villages, while only 25% of the displaced returned to their original homes in one village. The study also shows that 25% of the people who returned to that village had income-generating or livelihood opportunities. This proves two aspects: first, families whose livelihoods were destroyed by the cyclone chose to relocate to other places or safer locations. The 25% of those who returned had an incentive to return as they hoped to resuscitate their businesses and livelihood. However, apart from this village and two other villages, all people returned to their homesteads. The report cited that they had returned permanently. This explains the assertion that people in Africa choose not to leave their place of birth but rather engage in temporal mobility.

In the aftermath of Cyclone Idai and Charlene, people in Chimanimani started to find ways to supplement and diversify their livelihoods. They did this using two ways, narrated by one of the participants:

As for me, I have not been outside the country; I go and work in banana plantations for about 4 weeks, and then I have to come back and provide for my family with food and money I would have worked for. In cases where it takes too long, I send cash transfers. (Participant A2, community member, male, talking cycles, Chikukwa Village, Chimanimani).

These are just short-term mobility initiatives where people sought to find other means of income, especially after sources of income had been destroyed. Research

on peasant agriculture has shown that when confronted by climatic challenges, farming households are forced to send at least one member to urban areas to search for paid employment as a strategy for diversifying incomes and cushioning the family from stressed livelihoods (Maganga, 2020). The second way was to cross the border to access better opportunities. The bad tropical events, aided by the changes in temperature and unreliable rainfall patterns, made farming more unreliable. This made the indigenous people of Chimanimani travel to Mozambique. Some started to do cross-border trading, while others went on to find work in Mozambique (Crush *et al.*, 2015). These findings are consistent with IPCC's observations. It is expected that by 2050, both movement within a country and mobility across borders will increase due to climate change. However, the number of people moving within a country will be much higher than international migration. This trend fits with the IPCC's assessment that climate change impacts are particularly pronounced in African countries. The IPCC also predicts that there will be a notable increase in internal migration, with a shift from rural areas to cities (Amakrane *et al.*, 2023).

In other areas, people would go to Mozambique's closest towns to buy food. One participant had this to say:

"Cyclone Idai destroyed my business; I had no choice but to go to Chimoio to buy clothes for sale in Harare. Prices of these goods are cheaper in Mozambique than in Zimbabwe. I cannot wait for farming right now; the rains will come when my family has starved. At least I should do cross-border trading for now. I am not the only one. Some traders come as far as Chipinge, and they go to Mozambique for groceries and to buy goods for sale; this is the only way to maintain my livelihoods." (Participant A23, community member, male, talking cycles, Kopa, Chimanimani).

"All my two sons are working outside the country in Mozambique and South Africa. They will come back next year when the farming season resumes. I hope we will not experience another cyclone. They are not the only ones; some villagers also left for Mutare and other cities, and others went to the plantations here in Chimanimani. However, it is just for short periods. They will return home and help with weeding and harvesting" (Participant A13, community member, female, talking cycles, Kopa, Chimanimani).

The cross-border trading and accessibility of Mozambique from the border villages made it easy for the affected villagers to cross the border and rekindle their livelihood. This is another case example of migration as an adaptation strategy. In this case, short-term mobility is indeed an adaptation strategy for the people in

Chimanimani who have been affected by tropical cyclones in recent years. Historically, there are social and cultural ties that exist between Mozambique and Zimbabwean border communities. The Chimanimani communities have traditionally maintained relations with people from Mozambique in response to economic, political, and social reasons. Mozambicans fled to Zimbabwe during the 1975 civil conflict and settled at Chipinge's Tongogara refugee camp (Hughes, 1999; Popphiwa *et al.*, 2023). At the same time, others also managed to integrate in areas like Chimanimani. Amid Zimbabwe's economic catastrophe, people in Chimanimani and Chipinge travel to Mozambican villages for jobs (Hlongwana, 2021; Spiegel *et al.*, 2023). The historic cultural exchange between the two nations has created stronger relations based on marriage, kinship, and ethnicity (Hlongwana, 2021; MacGonagle, 2007). As a consequence, there are nomadic families today along the border.

While others had the option to move across the border to find livelihoods, Participant A30 had a completely different encounter, with Cyclone Idai being her biggest challenge in terms of climate-induced disasters in recent memory. The participant had this to say:

"I lost everything during the cyclone, I used to be a cross-border trader earning a living, but the cyclone destroyed my house, and my travel documents were destroyed in the process. I do not have money to get new documents for me to resume my business." (Participant A30, community member, female, talking cycles, Ngangu, Chimanimani).

This account underscores the varied impact of Cyclone Idai on individuals' livelihoods and highlights the severe challenges faced by those who lacked the resources to recover. Participant A30's experience illustrates the compounded difficulties of losing both property and essential documentation, which hindered the resumption of her cross-border trading business. This case exemplifies the critical need for targeted support to help the most vulnerable rebuild their lives and regain economic stability in the aftermath of climate-induced disasters.

3.3. Long-term mobility patterns

Field observations reveal that human mobility patterns in Chimanimani have shifted. Previously, people migrated to Chimanimani in search of arable land and permanent settlement due to its locations in regions I and II, which receive better rainfall. Some individuals choose to move to the area permanently. Droughts linked to climate change made people move from Manicaland's western low-lying areas, which receive rain not enough to sustain agricultural activities. However, a stretch of mountains in the province's east, running from Nyanga in the north to Chimanimani

in the south, still has flowing rivers due to abundant rainfall received in the region. According to the Ministry of Local Government, Urban, and Rural Development, over 20,000 individuals from the dry regions of districts such as Mutare, Nyanga, and Chipinge have moved to the Chimanimani area, settling on fertile land not designated for human habitation (Mambondiyani, 2015). However, due to droughts caused by cyclones and high temperatures over the last couple of years in communal areas, these trends have changed. The majority of the participants revealed that the worsening climatic conditions have been exposing Ndaup people to food insecurity and low agricultural incomes; hence people opting to out-migrate and settle permanently in places like Chipinge or Buhera. These are places often referred to as not agriculturally productive. One participant had this to say:

"I stayed behind, I was born here, and I am a leader in this community, I cannot afford to go to areas like Chipinge and Buhera where I have seen others go to resettle. The process of resettling requires more capital but those with money have gone there to start animal husbandry among other projects. I have life examples of people who moved away from here permanently. These include some of my friends and other well-to-do families who can withstand such areas. As for me, I have to stay with people who are left here." (Participant B2, Village headman, Male, Kopa, Chimanimani).

Other participants echoed these sentiments, noting that these movements were driven by the high prevalence of natural disasters, such as cyclones that killed people and destroyed properties and agricultural lands in Chimanimani. However, those who moved had financial capital to start new projects where they could and also to withstand the effects of climate change in those lands that are not agriculturally suitable. The historical narratives reveal that people who had kinsmen in closer areas such as Chipinge and Borderline villages in Mozambique were able to make quick mobility decisions following the climatic disasters. The Chimanimani area is mostly inhabited by the Ndaup people who have relatives with other Ndaup kinsmen in Chipinge and Mozambique (Hlongwana, 2021). These ties played an important role in motivating the mobility patterns of Chimanimani people residing in the most affected areas, like Kopa and Ngangu. Kinship ties influenced families' decisions to move permanently away from the affected areas or the ability to withstand times of climatic crisis. One participant summed up the whole situation well.

"In the aftermath of the cyclone, in fact, in times of crisis, we have always helped each other, they say, *"Kutsva kwende vvu Varume vanodzimurana."* It is an idiom that

indicates that “man helps each other when crisis attacks.” *pamwe tinoti “Nhamo yako ndeyangu”* (“Your problems are mine”). Our kinsman in Chipinge came to our aid in terms of resources. We went there to settle temporarily, and we left others there. It is only that I am a grown man, and I prefer to die in the land of my fathers. I would have stayed with my relatives. However, this is a new year, and I will survive here. I would not deny we left young people there in Chipinge; they are continuing with their lives” (Participant B6, elderly woman, Ngangu village, Chimanimani).

The participants noted that they would not have succeeded without the support of their kinsmen, who provided shelter, land, and assistance with relocation. In addition, the participants received valuable information from their kinsmen about areas with good livelihoods, available agricultural land, job opportunities, and marketable products. These findings are consistent with Nyahunda & Tirivangasi (2021b), who argue that social capital enhances the adaptive capacity of a community to climate-induced disasters in rural Zimbabwe. Regarding long-term climate-induced human mobility in Chimanimani, the researcher noted a change in the historical narrative where people who were often reluctant to leave vulnerable areas near the mountains and rivers are now willing to relocate. The interviews with NGO officials working in Chimanimani revealed that the United Nations Office for Project Services (UNOPS) and the World Food Programme were building permanent structures for the affected communities. The UNOPS, at the time of the study, was building climate-resilient houses similar to those built to withstand earthquakes. In a post-disaster situation, organizations involved in housing reconstruction aim to provide better housing to the surviving communities compared to their pre-disaster conditions. This approach has been effective in cyclone-prone countries like Fiji (Elkharboutly & Wilkinson, 2022). This commendable initiative has resulted in permanent, long-term human mobility in Chimanimani, not knowing how successful these were in the end. The community members have no choice but to abide by the provisions made available to them. The changing climate is now a reality in Zimbabwe, Southern Africa, and Africa as a whole.

4. Conclusions

The study examined human mobility patterns based on the experiences of the climate-affected Chimanimani constituency in Zimbabwe. Previously, community members often disregarded or dismissed climate-related communications due to their lack of firsthand exposure to the severe consequences of climate-related events.

Chimanimani, with its fertile land and favorable climate, attracted migrants from nearby areas seeking to relocate and establish new lives. Nevertheless, the frequent incidence of climate-induced disasters has prompted many to relocate to different locations. The researcher noted that most individuals, however, only engaged in temporary migration, returning to their place of origin after disasters. The Afrocentric interpretation of this phenomenon posits that community members possess a strong attachment to their birthplace. In Chimanimani, the researcher examined both short-term and long-term climate-induced mobility patterns. These findings reinforce the idea that most migration within Africa occurs internally, with individuals impacted by climatic disasters typically reluctant to move beyond their original locations. However, livelihood incentives significantly influence mobility decisions. Individuals often migrate in search of sustenance and temporary job opportunities to ensure their families’ survival. This study uncovers that, for long-term climate-induced migration, the decision to permanently relocate from impacted areas is contingent upon the availability of financial resources and the presence of relatives. The researcher successfully developed a new narrative using Afrocentric methodologies, specifically the philosophical sagacity approach and talking cycles. These methodologies are valuable for examining the connections between mobility and climate-related disasters. By emphasizing historical and cultural aspects, they facilitate a deeper understanding and re-conceptualization of internal and regional mobility. The researcher concludes that human mobility is an essential adaptation mechanism in response to climate-induced disasters.

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Conflict of interest

The author declares that he has no competing interests.

Author contributions

This is a single-authored article.

Ethics approval and consent to participate

The researcher obtained written consent from participants to participate in the study.

Consent for publication

The researcher ensured the anonymity of participants when reporting excerpts and ensured that the research was not harmful to the participants in any way.

Availability of data

Data used in this work is available from the corresponding author on reasonable request.

Further disclosure

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