Remitting, Resilience, and Climate Adaptation in an African Migration Corridor

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Abstract

Climate change and crises are exacerbating environmental vulnerabilities across Southern Africa, contributing to population displacement and migration, thereby affecting internal and cross-border migration flows. In this changing landscape, cross-border remittances (cash and in-kind, such as food remittances) are increasingly vital to supporting climate adaptation and resilience. This paper examines the current state of knowledge about the role of cross-border remittances in helping migrant-sending households to cope with climate change and climate-induced shocks. The article also discusses the strategies households use to improve livelihoods and strengthen community-level resilience. The review of evidence on the South Africa-Zimbabwe remittance corridor shows that changing forms of cross-border remitting can serve as a key coping and adaptation strategy to counter the adverse impacts of climate change. There is therefore an urgent need for research and policy attention to harness the significant potential of remittances to create climate-resilient livelihoods across Southern Africa.

Keywords

Climate change, climate adaptation, migration, remittances, resilience, Southern Africa

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Cover Image

Rural women clearing a field for farming in Mahenye, Manicaland Province, Zimbabwe. Photo credit: Robert Fried/Alamy

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Introduction

The movement of people across international borders is increasingly influenced by new social, political, economic, and cultural forces (Crush & Ramachandran, 2010; Dinbabo & Nyasulu, 2015; Makina & Pasura, 2023; Tevera & Raimundo, 2021). The impacts of climate change are also becoming more apparent. evident in shifting weather patterns, rising sea levels, and more frequent and intense extreme weather events, which contribute to higher levels of human mobility (Kanyayi et al., 2025; Rigaud et al., 2018; Sithole et al., 2025a; 2025b). Climate-induced migration is on the rise due to recurring droughts, floods, and erratic rainfall, which have detrimental effects on agricultural productivity in rural areas across the African continent (Kanyayi et al., 2025; Kwanhi et al., 2024; Lindsey & Dahlman, 2020; Niang et al., 2014; Mpandeli et al., 2020). These changes disrupt national economies, affect livelihoods, and impose significant financial burdens on individuals, communities, and nations (Blöschl & Montanari, 2010; Núñez-Sánchez & Valente, 2023).

However, migration also serves as a risk-diversification strategy for households facing climate-induced socio-economic shocks. In this context, remittances in cash and in-kind sent by migrants to their families are crucial for household resilience and adaptation (Chikanda et al., 2020; Crush, 2013; Dinbabo, 2024; Dinbabo et al., 2021; Sithole et al., 2023;UNDESA, 2019). Climate change leads to an increase in the intensity and frequency of extreme weather events such as droughts, cyclones, floods, and heat waves, negatively impacting development and triggering migration (Black et al., 2011; Cattaneo et al., 2019; Kanyayi et al., 2025; Mazani & Dinbabo, 2025; Mpandeli et al., 2020). According to the Internal Displacement Monitoring Centre (IDMC), approximately 13.9 million people are expected to be displaced or lose their livelihoods each year due to weather-related disasters (Anzellini et al., 2017). An earlier study by Myers (2002) projected that rising sea levels, desertification, and water scarcity could displace more than 200 million people by 2050. Africa is widely regarded as a climate and migration hotspot (Agboola et al., 2025; Kwanhi et al., 2024; Pillay et al., 2008). Within the continent, Southern Africa is expected to experience the most significant increase in climate-related cross-border mobility, with an estimated 200,000 and 800,000 people potentially relocating to neighbouring countries by 2050 (Williams, 2024).

Migrant remittances are increasingly framed as a promising strategy for climate adaptation and resilience strategy at both the household and community level (Musah-Surugu & Anuga, 2023). However, literature on climate financing often overlooks the potential and promise of remittances as a source of non-governmental financing of climate adaptation and resilience at the local level (Annan-Aggrey, 2025; Asiedu et al., 2025). Additionally, while remittances are acknowledged in the migration-as-adaptation literature, they have not been sufficiently theorized or empirically examined as a central mechanism linking mobility to household-level climate adaptation (Kaczan & Orgill-Meyer, 2020; Sakdapolrak et al., 2024; Vinke et al., 2020). Much of the migration-as-adaptation literature infers adaptive outcomes from migration itself, without sufficiently interrogating whether, how, and under what conditions remittances translate mobility into measurable resilience gains. Therefore, greater research attention is necessary to understand remittance practices, their spatio-temporal dynamics, and their interactions with food security and livelihoods to provide a more grounded and realistic assessment of migration's adaptive potential.

At the macro-level, the substantial volume of remittances to and within Africa calls for increased attention to their role in climate adaptation, particularly regarding household resilience to food insecurity, improved access to basic needs, and the rebuilding of homes and livelihoods following extreme weather events (Ratha et al., 2024; Sithole et al., 2022). Global remittances surpassed USD850 billion in 2024, with low- and middle-income countries receiving the largest share (USD656 billion). Remittance transfers to Sub-Saharan Africa were estimated at around $95 billion in 2023, while intra-African remittances amounted to approximately USD18-22 billion (AFC, 2025; Ratha et al., 2024; World Bank, 2023). Critics argue that, while remittances can boost household income and support local livelihoods, they may also exacerbate existing inequalities by disproportionately benefiting households with migrant members. This situation widens income gaps within communities, intensifying inequalities between households and creating uneven patterns of economic and social adaptability (Anwar et al., 2024; Bang et al., 2022; Musakwa & Odhiambo, 2020; Nyikahadzoi et al., 2019). Others assert that remittances foster dependence syndromes, reducing incentive to work and increasing reliance on external income flows (de Haas, 2010). Furthermore, remittances are usually directed toward short-term consumption rather than productive investment, thereby limiting their long-run impact (Abdih & Gammadigbe, 2022; Adams & Cuecuecha, 2013).

The extensive literature on the positive impacts of remittances primarily focuses on poverty alleviation, often overlooking other crucial aspects such as adaptation to climate change and building resilience during and following extreme weather events. Migration-as-adaptation research often treats migration as a displacement response rather than viewing it as a viable adaptation strategy and a means for diversifying livelihoods. Against this backdrop, remittances can serve as a lifeline for households increasingly vulnerable to climatic shocks. There is increasing evidence that migrant remittances can function as an adaptive mechanism for coping with climate change. Several recent interventions argue that remittances play essential roles in buffering communities against climate shocks, helping to sustain rural livelihoods amidst environmental stresses (Cundill et al., 2021; Escribano & Ganddini, 2024; IFAD, 2024; Maduekwe & Adesina, 2021; Mpandeli et al, 2020; Musah-Surugu & Anuga, 2023).

One study in the Pacific has demonstrated that remittances tend to increase to support disaster relief and recovery, as

well as the rebuilding or repair of homes (Pairama & Le Dé, 2018). Community members have also used remittances to fund preventive measures, such as the purchase of water tanks. In the African context, Musah-Surugu & Anuga (2023) found that remittances were a substantial source of income for many households, and significantly contributed to climate adaptation. These remittances directly supplemented declining income from farming, fishing, and livestock sales. Another study in Mali revealed that migrants send remittances to help improve the living conditions of those who remain behind (IFAD, 2024). Therefore, remittances offer a broader opportunity to involve diasporas in reducing vulnerability and increasing the readiness of communities left behind (Annan-Aggrey, 2025).

A review of the literature reveals a significant gap in research on the role of remittances in climate change adaptation and resilience in Southern Africa. In Southern Africa, recurrent droughts and floods make migration and remittance systems increasingly essential (Mpandeli et al., 2020). A few studies of remittance flows and their utilization in the region indicate that they significantly contribute to the economic and social well-being of receiving communities and play a significant role in meeting household needs (Pendleton et al., 2006; Sithole et al., 2023; Sithole & Dinbabo, 2016). While much of existing research focuses on the interaction between intra-regional migration and remittance dynamics, few studies explicitly explore how these financial flows contribute to adaptive capacity and resilience-building in climate-vulnerable communities.

This paper seeks to enhance our understanding of the intersection between migration, remittances, and adaptation to climate change in Southern Africa, specifically focusing on the South Africa–Zimbabwe migration and remittance corridor. The paper will first review patterns, drivers, frequencies, and characteristics of remitting in this corridor. Next, it will explore the nexus between climate change, migration, and remittances. Then, it will assess the evidence of household adaptation to climate change through remittances. Finally, the paper aims to highlight the challenges faced and propose policy and practice recommendations for maximizing the resilience potential of remittances in Southern Africa.

The South Africa-Zimbabwe Remittance Corridor

Remittances primarily address immediate needs, but they can also strengthen long-term resilience. In Zimbabwe, households use remittances to manage risks associated with droughts, food insecurity, inflation, and economic instability. Additionally, remittances help sustain both rural and urban livelihoods and consumption. Despite their potential for development, remittance flows face significant structural challenges. These include high transfer costs, documentation requirements that exclude undocumented individuals, inconsistent regulatory frameworks between South Africa and Zimbabwe, and limited interoperability of payment systems. As a result, the remittance corridor exists within a dualistic financial landscape. While fintech (financial technology) innovations aim to promote inclusion, they can also exacerbate exclusion due to regulatory misalignments and infrastructural disparities. This dual and uneven nature of remittance circulation highlights both the resilience and the fragility of transnational financial networks in Southern Africa.

Global remittances to Zimbabwe contribute approximately 11% of the country's GDP, and the South Africa–Zimbabwe remittance corridor is the most significant inbound flow, averaging more than 3 million transactions per year (IOM, 2023). Remittance flows from South Africa have become vital for households to access food, healthcare, education, clothing, and shelter, as well as other basic needs (Crush et al., 2015; Nyikahadzoi et al., 2019; Sithole et al., 2024; Tevera & Chikanda, 2009). A study of Zimbabwean youth migrants in South Africa found that most remitted cash for food and other necessities, and a few sent food items back home (Sithole & Dinbabo, 2016). Higher earners generally remit more than low-income migrants, as do men and married individuals (Makina, 2013). Remitting also varies with legal status. For example, undocumented migrants remit smaller, more frequent amounts through informal channels. In contrast, skilled migrants in urban South Africa remit larger sums less frequently using formal systems.

The remittance corridor is dominated by cash remitting through various formal platforms, including banks, money transfer operators, and mobile money and fintech companies such as Mukuru, Malaicha, and Mama Money, as well as Ecocash (Sithole et al., 2023, 2024). Digitalization, fintech innovations, and the integration of social media apps into transactions are transforming remittance ecosystems. They are increasing efficiency, expanding access, and providing services that are speedy, reliable, secure, affordable, easy to use, and reachable (Sithole, 2023; Sithole et al., 2022). They are also reducing financial barriers and improving the accessibility of remittance services for rural dwellers and low-income urban households who lack access to formal banking services (Chikanda, 2024; Sithole et al., 2022). Crucially, they also facilitate smaller, more frequent transfers that support daily household needs. However, digital transformation remains uneven. For example, the benefits of technological progress are constrained by the digital divide, gender disparities, limited literacy, regulatory constraints, structural barriers, slow adoption of artificial intelligence (AI) and blockchain (cryptocurrency) technology, and infrastructure deficits.

Digital remittances and financial technology services are disrupting well-established informal remittance practices (Crush & Tawodzera, 2023). Informal cash remittances are sent through transport carriers, social networks, or hand-carried cash. In-kind remittances are also prevalent, including food and groceries. These are also facilitated by transport carriers (known as *malaichas, malayisha, malayitsha*, or *omalayitsha*) and by bus, truck, and minivan drivers (Thebe & Mutyatyu, 2017; Nyamunda, 2014). Fintech companies are now increasingly involved in food and grocery transfers

to Zimbabwe through digital or mobile services (Sithole, 2022; 2023; Sithole et al., 2022, 2023, 2024). Most Zimbabwean migrants in South Africa remit funds and goods to Zimbabwe for food and other necessities, including access to health, education, and shelter, as well as clothing. Remittances from South Africa have also been used to purchase drought-tolerant seeds, fund boreholes, and support food security (Crush & Tawodzera, 2016; Chikanda, 2024; Sithole & Dinbabo, 2016; Sithole et al., 2023).

Remittances primarily target immediate needs, but they can also strengthen long-term resilience. In Zimbabwe, households use remittances to manage risks associated with droughts, food insecurity, inflation, and economic instability. Additionally, remittances help sustain both rural and urban livelihoods and consumption. Despite their potential, remittance flows face significant structural challenges. These include high transfer costs, documentation requirements, misaligned regulatory frameworks between the two countries, and limited interoperability of payment systems. As a result, the remittance corridor exists within a dualistic financial landscape. The dual and uneven nature of remittance circulation reflects both the resilience and the fragility of transnational financial networks in Southern Africa.

Remittances and Climate Adaptation

Southern Africa is among the most vulnerable regions in the world to climate change. Zimbabwe has been significantly impacted by its reliance on agriculture, with much of its population consisting of rural poor individuals dependent on rain-fed farming (Ndlovu et al., 2020; Matsa, 2021). The country has faced recurring climate-related challenges, including droughts, floods, and heatwaves, that have severely undermined agricultural production and food security (Brown et al., 2012). Between 2000 and 2020, Zimbabwe experienced at least 11 drought events, along with several tropical cyclones, including Cyclone Idai in 2019, which displaced thousands and eroded rural livelihoods (Matsa, 2021). The climate-induced stress on livelihoods in Zimbabwe has led to increased migration, as households facing failed harvests or livestock losses increasingly depend on family members in South Africa for food security and income (Nyikahadzoi et al., 2019).

The remittance corridor between South Africa and Zimbabwe exemplifies the complex relationships between migration, remittances, and climate resilience in Southern Africa. Amid economic crises, political instability, rising temperatures, recurrent droughts, extreme floods, and limited livelihood opportunities, remittances offer a vital mechanism for coping and adapting for households in Zimbabwe. Various case studies indicate that remittances play a crucial role in household survival, adaptation, and resilience, particularly in rural districts affected by recurrent droughts and erratic rainfall. In Matabeleland South Province, remittances are used to purchase food, drought-tolerant seeds, fertilizers, irrigation equipment, and livestock to recover from losses during droughts (Maphosa, 2007). Additionally, remittances serve as a source of capital, allowing families to diversify their livelihoods beyond agriculture. During environmental shocks, remittances increase as migrants support their families affected by disasters to rebuild or repair homes damaged by floods or cyclones. They also help recipients avoid hunger, stabilize consumption, and prevent households from resorting to negative coping strategies such as selling productive assets, reducing meal portions, or withdrawing children from school (Nyikahadzoi et al., 2019). Furthermore, remittances facilitate adaptive strategies and enable small-scale investments in livelihood diversification, asset recovery, and local infrastructure improvements, such as boreholes and irrigation systems (Cundill et al., 2021; Sithole et al., 2023).

In-kind and cash transfers serve as informal risk insurance, mitigating the impacts of recurrent droughts, erratic rainfall, and market volatility on households. In-kind remittances, especially staple goods such as mealie meal, rice, cooking oil, sugar, flour, beans, and meat, help address acute food insecurity and mitigate the impacts of supply chain disruptions during crises (Crush & Caesar, 2018; Sithole et al., 2023). In rural Zimbabwe, remittance inflows provide crucial resources for accessing agricultural inputs, repairing assets, and responding to emergencies during droughts or floods. While remittances significantly enhance short-term coping mechanisms, their role in promoting long-term adaptation and transformative resilience may be limited.

Several barriers hinder the optimal use of remittances for adaptation and resilience building. These include the small and irregular nature of transfers, the economic instability of migrant senders, and fluctuating exchange rates. Additionally, high transaction costs, digital and regulatory challenges, and the digital divide restrict access to remittance channels, particularly for undocumented migrants, unbanked individuals, informal workers and traders, women, low-income urban households, and elderly rural populations. Together, these factors limit the potential for collective community investments in infrastructure and climate-resilient livelihoods. Moreover, dependence on remittances can entrench existing structural inequalities and delay necessary systemic reforms. Thus, while remittances can enhance household-level resilience, they operate within a fragile socio-economic context, where sustained adaptation relies on wider policy, institutional, and financial frameworks.

Table 1 summarizes the interconnected themes and hypotheses warranting further research.

Table 1: Conceptual Summary: Migration, Remittances, and Climate Resilience		
Key Themes / Concepts	**Hypotheses**	**Potential for Climate Adaptation & Resilience**
Climate Change, Migration & Remittances	Economic, political, and environmental crises (especially drought and erratic rainfall) drive migration from Zimbabwe to South Africa. Remittances serve as critical livelihood support in sending communities.	Remittances enable households to respond to climate shocks by improving food security, repairing assets, diversifying livelihoods, and investing in small-scale infrastructure (e.g., water storage and housing improvements).
South Africa–Zimbabwe Corridor Dynamics	A large share of migrants remit frequently (in cash and in-kind, including food). Channels include formal, digital, informal, and hybrid systems. Digital and mobile remittance innovations are reshaping transfers, promoting financial inclusion, and bridging gender, rural and digital divides.	Fintech enhances efficiency. However, it can reinforce digital inequalities related to the digital divide, gender, literacy, and infrastructure gaps. Therefore, inclusive regulation is essential to ensure equitable access. Digital and hybrid (formal and informal integration) remittance systems strengthen transnational resilience networks, though high costs, documentation gaps, and regulatory misalignment constrain access to formal channels.
Remittances & Household Resilience	Remittances cushion households against climate and economic shocks, enabling consumption smoothing, small-scale farming investments, and emergency responses.	Short-term impact on coping with shocks is substantial, but long-term adaptation and community-level investment remain limited due to the small size of remittances and migrants' economic precarity.
Challenges & Structural Barriers	Persistent drawbacks include high transaction costs, weak regulation, currency volatility, the digital divide, exclusion of undocumented migrants, unbanked informal workers and traders, and low-income earners. Also, limited rural access, and data gaps regarding informal and in-kind flows.	Addressing these requires harmonized cross-border regulation, improved digital inclusion, and climate-smart financial instruments (e.g., microinsurance and remittance-linked savings).

Implications for Policy and Practice

In much of Africa, the failure of national governments to integrate migration and remittance dynamics into climate resilience planning undermines climate adaptation efforts (Mpandeli et al., 2020). Although remittances represent the most direct financial link between migration and climate resilience—with great potential for adaptation—policy attention remains limited to both their benefits and the obstacles that prevent their effective use. The South Africa–Zimbabwe corridor illustrates this, with structural and systemic barriers, including high transaction fees that exceed global targets, constraining remittances' transformative potential for inclusive development and climate adaptation (Sithole, 2025). Despite supportive regional frameworks, costs remain high: remittance costs to Africa average 9%, rising to 11% for intra-African transfers (Sithole et al., 2024), undermining household value and resilience.

Another barrier to maximizing remittances for climate adaptation is regulatory divergence across South Africa and Zimbabwe, which affects interoperability and efficiency (Lawack & Mziray, 2024). Currency volatility in Zimbabwe's multi-currency environment erodes the value of remittances and discourages the use of formal channels. Digital divides, disparities in internet access and digital literacy, and restrictive Know-Your-Customer (KYC) requirements intensify financial exclusion for women, rural and low-income urban households, the unbanked, and undocumented migrants. KYC requirements mandate identity verification using documentation such as passports, IDs, immigration status, proof of address, cell phone numbers, and proof or source of income.

In the context of Southern African remittance corridors, these requirements are implemented by banks, fintech companies, mobile money providers, and money transfer operators. Implementations are carried out in accordance with regulations established by central banks/financial intelligence authorities in specific countries to mitigate money laundering, terrorism financing, and other forms of financial crime. Many Zimbabwean migrants in South Africa are undocumented and excluded from formal banking. This makes it difficult for migrants to remit; forcing them to rely on risky informal networks (Sithole et al., 2024). Informal remittance channels are commonly relied on because of trust, familiarity, and their lack of bureaucracy; however, they are associated with significant risks, such as theft, delays, loss or damage of goods, border confiscation, and limited or no compensation (Sithole, 2025; Tevera & Chikanda, 2009). Notably, the parallel use of informal, formal, and fintech/digital mechanisms has created a hybrid remittance system that enhances the flexibility and resilience of remittance flows.

To unlock the full potential of remittances for climate adaptation, policy must explicitly frame migration and remittances

as key adaptive tools for climate resilience. Regional governments and the SADC should prioritize reducing transaction fees through competition among money transfer operators and work to achieve Sustainable Development Goal 10 to make transactions more accessible for vulnerable communities. These steps are necessary for sustainable, timely, and effective interventions during disasters. Support for Fintech and digital remittance platforms is needed to provide low-cost, secure alternatives. Most importantly, strengthening interconnections among migration, remittances, and climate adaptation requires moving beyond transactional efficiency to address underlying structural barriers.

Governments and regional institutions should establish cross-border regulatory harmonization to reduce remittance costs, enhance interoperability, and improve consumer protection. Investing in digital and financial inclusion infrastructure, especially in rural/remote areas, high-density urban areas, and marginalized communities, is essential for expanding access for women, undocumented migrants, the unbanked/underbanked, informal workers/traders, and low-income households. Additionally, cross-border migration needs to be incorporated into regional and national development plans through the development of comprehensive regional adaptation frameworks. This would help build resilience and adapt to future changes amid resource insecurity and instability (Mpandeli et al., 2020). National governments should also enhance diaspora engagement through market-based mechanisms focused on climate resilience, such as diaspora bonds to fund water infrastructure and agricultural technologies, as well as early-warning systems. They should also develop mechanisms that enable communities to access and pool remittances, including grants, blended finance, cooperatives, and informal savings clubs such as stokvels.

Policymakers should also promote remittance and climate finance instruments. For example, microinsurance, savings products, green investment schemes, and the channelling of remittances for adaptive livelihoods and community resilience projects. Additionally, integrated data systems are needed to capture remittance flows, thereby enabling more evidence-based policymaking. A shift toward inclusive, gender-responsive, and climate-smart financial governance is crucial to transforming remittances from short-term coping mechanisms into catalysts for equitable and sustainable resilience across Southern Africa. Finally, data gaps and misalignment in the measurement of informal and in-kind transfers obscure the accurate scale and socio-economic impact of remittance flows, hindering evidence-based policymaking. Therefore, addressing these challenges requires harmonized cross-border financial regulation, investment in fintech, digital, and financial literacy, and the development of climate-smart financial instruments, such as remittance-linked microinsurance, savings products, and green credit products. Thus, only through such integrated approaches can the corridor evolve from a fragmented system of survival transfers into an inclusive, resilient, and development-oriented remittance ecosystem.

Conclusion

Policies are urgently needed that recognize climate-induced migration as an adaptive strategy rather than a crisis. However, coordination is required on governance and cooperation, gender-responsive financial inclusion, and evidence-driven policy innovation to optimize migrants' contributions to resilience-building and enhance climate-resilient livelihoods across Southern Africa. Remittances increasingly serve as bottom-up, people-centred climate finance. Particularly when global climate finance remains insufficient or unevenly distributed. Remittances are crucial for filling gaps left by formal institutional responses; however, their transformative potential depends on structural/policy conditions. For example, it is vital to reduce transaction costs, harmonize regulations, and integrate remittances into broader climate-development frameworks.

The South Africa–Zimbabwe migration corridor exemplifies how remittances (cash and in-kind, including food remittances) can serve as mechanisms of climate adaptation and household resilience. Remittances enable families to sustain food security, rebuild assets, and absorb shocks such as economic crises, political instability, recurrent drought, and floods. However, remittances can also exacerbate inequalities between migrant and non-migrant households. This risks state complacency in addressing structural drivers of vulnerability. This paper, therefore, draws attention to the need for more critical research and multi-level collaboration to harness remittances as catalysts and instruments for equitable and sustainable adaptation in the region.

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