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RURAL EMPLOYMENT

The climate change, rural livelihoods and migration nexus in Zimbabwe
Impacts on rural livelihoods and adaptation

UNIVERSITY OF ZIMBABWE

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Impacts on rural livelihoods and adaptation

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Acknowledgements

Abbreviations

CSPro	Census and Survey Processing System
FCS	Food Consumption Score
FGD	focus group discusssions
HFIAS	Household Food Insecurity Access Score
IOM	International Organization for Migration
IPCC	Intergovernmental Panel on Climate Change
KII	key informant interview
MOU	Memorandum of Understanding
NGOs	non-governmental organizations
UNDP	United Nations Development Programme
SPSS	Statistical Package for the Social Sciences
USD	United States Dollar (s)
ZIMSTAT	Zimbabwe Statistical Agency
ZIMVAC	Zimbabwe Vulnerability Assessment Committee

Executive summary

The study explored the climate change-migration nexus in four selected districts in Zimbabwe, namely Beitbridge, Chiredzi, Chipinge and Tsholotsho. This included investigating the impact of climate and environmental change on migration decisions and the relationship between migration and climate change adaptation. The study utilized a mixed methodology, combining a household-level quantitative survey conducted through a software-based questionnaire with qualitative data gathered from key informant interviews and focus group discussions.

The findings reveal that, overall, high rates of poverty in the four study districts are exacerbated by the adverse impacts of climate change on rural livelihoods. The majority of the surveyed households reported that increasingly variable and unpredictable rainfall patterns, rising temperatures and more frequent droughts not only make it challenging to plan agricultural activities, but livelihoods are also negatively affected through the destruction of crops, livestock and assets and crop failures. Most households survive on low incomes and experience food insecurity.

All districts are experiencing high levels of out-migration. While climate change is certainly an important factor, migration is linked to multiple drivers. In the four study regions, economic conditions emerged as a prominent factor underpinning migration decisions. South Africa is considered the main destination, while a smaller share of migrants also moved to Mozambique and Botswana. Most of those who are migrating are male youth (with the average age being 35 years). Hence, this confirms already available research that gives prominence to male migration. This is explained in terms of gender roles, where men are considered breadwinners while women's traditional gender roles are tied to social reproduction. Although most migrants have some form of secondary school-level education, it is insufficient to secure well-paid jobs, and many end up in precarious employment, mostly working in construction, the services industry, and the agricultural sector.

Migrants send both monetary and in-kind remittances, but their frequency and value tend to be low. This is unsurprising, considering the employment situations of migrants in low-skilled and low-paid sectors. Common in-kind remittances are food items, clothing, and medicine. Overall, more than half of the migrant-sending households across the four districts do not receive remittances at all.

While remittances appear to support improved food security for migrant-sending households, migration does not translate into effective adaptation strategies. There is no evidence of investment into productive assets, and in fact, households with migrants are less likely to adopt conservation agriculture and have less land under cultivation. Overall, remittances are irregular and generally low amounts, which is not surprising considering the low-paid nature of migrants' employment and the incidence of unemployment among migrants. Nonetheless, remittances appear to be somewhat responsive to climate shocks, as both financial and in-kind remittances increase following crises. However, while slightly over half of migrant households cited improvement in coping with drought, only a few households attributed this improvement to remittances. Other challenges emanating from migration, such as the loss of a young productive labour force and adverse social consequences, which include high school drop-out rates, early marriage and child-headed households, could also undermine the well-being and resilience of young generations and exacerbate future levels of poverty and vulnerability in rural areas.

Introduction

Africa is likely to experience warming and increased climate variability by the late 21st century, which have been linked to adverse economic outcomes (Mueller *et al.*, 2020). Human-induced climate change, including more frequent and intense extreme events, has caused widespread adverse impacts and related losses and damages to nature and people beyond natural climate variability (IPCC, 2022). The Intergovernmental Panel on Climate Change (IPCC) 6th Assessment Report's (2021) continental projections for Africa indicate a projected increase in temperature and weather extremes (Box 1).

Box 1: Climate projections for Africa

- Mean temperatures and hot extremes have emerged above natural variability, relative to 1850−1900, in all land regions in Africa;

- The rate of surface temperature increase has generally been more rapid in Africa than the global average, with human-induced climate change being the dominant driver;

- Observed increases in hot extremes (including heatwaves) and decreases in cold extremes (including cold waves) are projected to continue throughout the 21st century with additional global warming;

- Marine heatwaves have become more frequent since the 20th century and are projected to increase around Africa;

- Relative sea level has increased at a higher rate than the global mean sea level around Africa over the last three decades. Relative sea-level rise is likely to virtually certain to continue around Africa, contributing to increases in the frequency and severity of coastal flooding in low-lying areas to coastal erosion and along most sandy coasts; and

- The frequency and intensity of heavy precipitation events are projected to increase almost everywhere in Africa with additional global warming.

Source: IPCC. 2021. *Sixth Assessment Report - Regional Fact Sheet-Africa*. IPCC Working Group I – The Physical Science Basis. https://www.ipcc.ch/report/ar6/wg1/downloads/factsheets/IPCC_AR6_WGI_Regional_Fact_Sheet_Africa.pdf

Southern Africa has come under the spotlight with droughts, cyclones and floods. The dry climates of southern Africa have, over the years, increased in frequency (Chikwiramakomo, 2021). Eckstein *et al.* (2019) detail casualties with regard to sea surface temperatures caused by reduced rainfall and increased local air temperatures. They recognized the Southwest Indian Ocean, including the Mozambique Channel, as a hotspot of tropical storms and cyclones characterized by significant loss and damage in the areas hit. From March to April 2019, Mozambique was impacted by cyclones Kenneth and Idai, the strongest tropical cyclones on record, followed by two further, albeit less intense, cyclones (Eline and Hudah) between February and March 2000. Cyclone Idai also hit Madagascar, Malawi and Zimbabwe. In late January 2022, Tropical Storm Ana brought winds, heavy rains, damage and destruction to parts of Madagascar, Mozambique, Malawi and Zimbabwe. Ana was followed by Tropical Cyclone Batsirai, which hit the south coast of Madagascar on 5 February 2022 (Otto *et al.*, 2022). Between 2000 and 2019, Zimbabwe heavily suffered from three major tropical cyclones. Cyclone Eline hit the eastern and southern districts of Zimbabwe in February 2000 with heavy rains and high-speed winds (Mavhura, 2020).

The question of whether and how climatic factors influence human migration has gained both academic and public interest in recent years and has risen on the policy agenda. Climate change is recognized as one of the key drivers contributing to mobility in the Agenda for Humanity, the 2016 United Nations Summit for

Refugees and Migrants, the Global Compact for Migration and the Global Compact on Refugees. However, the relationship between climate change and migration is complex, and it is not possible to establish direct causation in most cases. The Foresight report (2011) argues that decisions to move are shaped by five broad categories of intersecting drivers: political, demographic, economic, social, and environmental conditions. For example, climatic factors are often intertwined with other social and economic factors, which themselves can be influenced by climate change and variability. As such, climate change increasingly shapes the need and decision to migrate, often indirectly by affecting rural livelihoods, availability of resources and incomes. Through adverse impacts on the availability of resources, climate change is also altering existing migration patterns, such as the long-established migration routes of pastoralist and transhumant groups or seasonal migration between rural areas (IOM, 2010). The IPCC's 6th Assessment Report (2022) shows that climate change will continue to contribute to migration from climate-affected areas, mainly rural areas, due to increased drought frequency, floods, sea-level rise, and desertification, among other environmental changes. However, migration is also a source of risk and is characterized by many uncertainties.

Migration is one possible adaptation strategy in the context of climate change, alongside other possible responses. In the context of changing climate and environmental conditions, migration occurs on a forced-voluntary continuum and can range from more voluntary forms of labour migration to forced migration or displacement. Importantly, climate change does not inevitably lead to population movement. Immobility is another possible outcome of climate change when poorer households lack social and financial resources to support migration and are forced to stay. Resource and credit constraints may prevent households from migrating due to an inability to cover upfront costs (Laczko and Aghazarm, 2009). Again, environmental change can increase the incentive to move, but it can also limit the capacity to do so (Black *et al.,* 2011b). Benverniste *et al.* (2022) echo that resource constraints caused by climate change impacts may limit the ability to migrate, thereby leading to immobility. Immobility may also be a matter of choice, whereby people prefer to stay in high-risk areas due to a strong attachment to a place (Adams, 2016; Farbotko, 2018).

Migration can both increase risk and strengthen resilience (Guadagno, 2016, p. 30). The outcomes of migration are sometimes measured using the impacts of remittances on rural livelihoods. When migration is an act of choice, it can serve as an important adaptation strategy in the context of changing climate and environmental conditions. Migration allows households and individuals to diversify livelihoods, manage risks and address existing vulnerabilities. Migrant remittances (including the transfer of finances, skills and ideas, among other things) can improve households' adaptive capacity and resilience, for example, by fostering the adoption of sustainable and climate-smart agricultural practices. Tacoli and Mabala (2010: 394), however, argue that "while there is no doubt that remittances reduce vulnerability and increase resilience in sending households — which may be crucial in the context of climate change — important ethical questions should be posed if they come from exploitative, insecure work." Others have highlighted a further moral dilemma emanating from transferring the responsibility for climate action, *vis-à-vis* the migration as adaptation discourse, onto households and individuals, thus risking policy inaction (Vinke *et al.*, 2020). However, policy support, including an enabling policy environment, is crucial for realizing the potential of migration for climate change adaptation.

In the Zimbabwean context, there are already indications that rising temperatures and increasing rainfall variability are affecting agricultural outputs and, with that, food and nutrition security. In 2015, it was already observed that in Zimbabwe, climate change would cause average temperatures to rise by about 3°C before the end of this century, annual rainfall could decline by between 5 percent and 18 percent, especially in the south, and rainfall would become more variable with an increase in droughts, floods and storms (Brazier, 2015). Around 70 percent of the country's population lives in rural areas, and the majority of these people depend on agriculture and its related activities. According to UNDP (2014), climate change is rapidly taking place in dryland regions and causing serious reductions in agricultural production. In this context, the notion of migration as adaptation has also emerged. Maganga (2020) reported that data on irregular Zimbabwean migrants in South Africa showed that most are from small-scale farming communities

who left in response to droughts and food shortages. Labour Force and Child Labour Survey (ZIMSTAT, 2019) indicates that approximately 124 000 people left their homes in search of better agricultural land, with another 4 000 people reported being displaced by extreme events between 2011–2019 in Zimbabwe. Although economic and political factors dominate human mobility literature in Zimbabwe, studies by Crush, Chikanda and Tawodzera (2012) and Crush and Tawodzera (2016) show that 44 percent of the total 1.6 million Zimbabweans in South Africa are believed to have migrated because of drought-related food insecurity. Brazier (2015) showed that change is already worsening the existing food insecurities in Zimbabwe's communal farming areas, increasing migration pressure as a way of coping with the adverse effects of climate change. However, it is important to note that it is difficult to discern climate-related and economic drivers of migration due to climate change's direct and indirect impacts on livelihoods, which have economic implications.

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Aims and objectives

The study aimed to investigate the climate change-migration nexus in selected provinces in Zimbabwe, including the influence of climate and environmental factors on rural migration patterns and the relationship between migration and climate change adaptation. Three key issues are pertinent to understanding this relationship:

A) Understanding the complexity of the nexus between climate change and migration, including how climate and environmental factors shape people's needs and decisions to migrate. Key research questions are as follows:

- **Which are key factors that contribute to/shape the need and decision to migrate? How do they interact with each other?**
- **What is the role of climate change?**

B) Understanding climate-related mobility characteristics, trends and patterns. Key Research questions are as follows:

- **Which factors mediate human mobility and immobility?**
- **What are migrant profiles and migration patterns?**

C) Exploring the impact of migration on climate change adaptation in the areas of origin of migrants. Key research questions are as follows:

- **What are remittance types and patterns?**
- **What are the current challenges that households face in receiving and investing remittances?**
- **How, if at all, are remittances transferred and invested in rural livelihoods, and what are the implications for climate adaptation?**
- **What is the impact of migration on the family members that remain behind, and what are the implications for adaptation?**

Research methodology

The complex relationship between migration and climate change called for a mixed-method approach. The research used a combination of qualitative and quantitative research methods. The quantitative approach adopted surveys and statistical analyses, and the qualitative approach provided an in-depth understanding of the phenomenon under study and emphasized contextual analysis of human behaviour. Qualitative research dealt with subjectivities and perceptions of people/organizations/structures, pre-conceptions, and assumptions behind most individual behaviours, institutional practices and policies around the climate change-migration nexus. A concurrent triangulation design was used where both quantitative and qualitative data were collected concurrently. Combining these approaches allowed numerical data to be supplemented by qualitative findings and contextual explanations of both researchers and the research participants.

Qualitative research

Desk review

The researchers conducted a desk review drawing on peer-reviewed and grey literature sources, among them policy documents. The desk review provided: (i) an analysis of migration dynamics, including a general overview of migration patterns and a focus on climate/environmental-related migration in Zimbabwe; (ii) an overview of climate change trends and impacts on rural livelihoods in Zimbabwe including a collection of good practices by migrant-sending households on migration-related investments as climate change adaptation strategy; (iii) an overview of relevant climate, migration and rural development policies and programmes in Zimbabwe. This secondary data collection and review were instrumental in getting a deeper understanding of the migration-rural livelihoods-climate change nexus in the country, as well as teasing out important issues that need further investigation. Therefore, the review's findings were instrumental in the development of appropriate primary data collection tools.

Focus group discussions

The research team visited the selected wards to conduct focus group discussions (FGD) in these areas. In addition to revealing individual opinions, FGD generated group discussions and provided information on group consensus, conflicts and interaction. An effort was made to include a diverse range of participants classified based on age and sex. The focus group discussion participants were selected purposely and included both participants from households with migrants and those without migrants. Two FGD per district were conducted, resulting in eight FGD in total. The average size of each group was between 10 and 12. Of the eight FGD, one was held with women only (Ward 2 in Chiredzi) and the rest were mixed. The time and place were decided in agreement with the participants, but most FGD were held at ward centres.

Key informant interviews

The key informant interviews (KII) were used to get an in-depth exploration of individual accounts regarding issues, drivers and effects of migration from the perspective of representatives of different sectoral organizations (government, non-governmental organizations, agriculture, etc.) working with communities in the research areas. The number of KII was informed by the availability of the key institutions linked to migration, rural livelihoods and climate change issues and varied across districts. The list of key informants is presented in Table 1.

TABLE 1. Key informants interviewed

Beitbridge	Chiredzi	Chipinge	Tsholotsho
2 Agritex Officers	1 Immigration Officer	2 Councillors	1 Police Inspector
1 Chief Executive Officer Rural District Council	1 District Agronomist	1 District Environmental Officer	1 District Youth Officer
1 District Development Coordinator	1 Probation Officer	2 Village Heads	2 Ward Councillors
1 Village Head	2 Village Heads	1 Red Cross Officer	4 Village Heads
2 Councillors	2 Councillors	1 Social and Environmental Officer (RDC)	1 Agritex Officer
	1 Ward Agritex Officer	1 District Agritex Officer	
	1 Ward Youth Development Officer	1 District Social Development Officer	
		1 Ward Agritex Officer	

Data analysis and reporting

Qualitative data analysis was done using a thematic analysis approach. Thematic data analysis was multi-layered and primarily inductive to let themes, issues, trends, patterns and conclusions emerge from the transcribed data. Due to the intuitive and inductive nature of qualitative data, thematic analysis consisted of three specific activities: (i) manually coding the data and refining the emerging codes to elicit an interpretation of perceptions provided by research participants, (ii) scrutinizing the data for recurring themes, concepts and propositions, and (iii) summarizing key themes and findings from interviews. Qualitative data helped to interpret and contextualize quantitative findings.

Quantitative research

The study used a quasi-experimental design to compare the outcome of households with a migrant and those without a migrant. The quantitative approach adopted a survey and statistical analysis. Insights from the literature review guided the researchers in developing a household questionnaire.

Selection of households

The survey targeted households with migrants and those without migrants at a ratio of 3:1. Two wards were purposefully selected in each of the four study districts based on the criteria that they had experienced climate change impacts and migration. A list of villages was drawn up in each ward with the help of village heads and other key informants such as headmen and councillors. Villages were then selected for inclusion through random selection, guided by the criteria that they could not be neighbouring villages. Households in included villages were once again identified with the assistance of village heads and were randomly selected for participation, including households with and without migrants. All in all, 502 questionnaires were administered, 127 to non-migrant households and 375 to migrant-sending households.

Survey data collection

Data was collected with the help of well-trained and experienced enumerators using Computer Assisted Personal Interview (CAPI) to capture and enter data during the interview process. This digital data collection technique uses CSEntry to collect data for surveys created using the Census and Survey Processing System, CSPro.

Survey quality assurance measures

To ensure the collection of high-quality quantitative data, the research team recruited enumerators with experience in undertaking surveys and qualifications in relevant social science and humanities disciplines. Gender considerations were taken into account to ensure gender balance and gender-sensitive data collection (e.g. conducting women-only FGD led by a woman). In total, 20 enumerators and two supervisors participated in the study, consisting of 9 male and 11 female enumerators and a male and female field supervisor.

To ensure the collection of quality data, the enumerators were trained in basic interviewing techniques to increase observer reliability and reduce data non-sampling errors caused by the interviewers' inability to interview and also differences in understanding of the questions. The training also focused on helping the enumerators familiarize themselves with questions and establish explanations and a common understanding of key concepts such as climate change, migration and climate adaptation, as well as teasing out examples of adaptive agricultural strategies. Prior to implementation, the research team piloted the questionnaire.

Field supervisors were responsible for overseeing the data enumeration process. Enumerators with high error rates were closely monitored. At the end of the day, the data was uploaded and collated by an experienced data clerk who cleaned the data for any outliers and gave feedback to enumerators through the supervisor. The use of CSEntry also assisted in maximizing data processing reliability by restricting data entry errors.

Survey data analysis

Quantitative data were analysed using the Statistical Package for the Social Sciences (SPSS) and presented in tables, graphs and figures. Apart from descriptive statistics, correlation analysis was done, and inferential statistics were provided, in particular, to show the nexus between climate change and migration, as well as the impact of this nexus on adaptation and rural livelihoods.

Ethical considerations

All participants were required to provide verbal consent. All KII and FGD were audio recorded with the respondents' consent. Where respondents refused to be audio recorded, detailed notes were taken. Audio files were downloaded onto password-protected computers.

Confidentiality

Data for the survey was collected by the research team and captured by data clerks with experience in research and trained in maintaining confidentiality. The qualitative data collection was undertaken by a research team experienced in dealing with confidential and sensitive information. Data was stored securely in a password-protected computer. Data was only accessible to researchers and authorized staff involved in data collection or analysis.

Voluntary participation and right to withdraw

Participants were informed of their right to withdraw from the study at any moment and that they could request that the information they provided be discarded and excluded from the analysis. Participants were

also informed that they could skip any questions they did not feel comfortable answering and remain silent during FGD.

Minimization of risks and mitigation of potential harms

To ensure that the research did not cause the participants any form of harm (moral, physical or emotional), training was conducted with all field interviewers on how to correctly obtain informed consent and how to discuss sensitive issues with respect for the interviewee's comments, values, beliefs, decisions and choices. The FGD were conducted in safe spaces, such as ward centres, that were also accessible to diverse groups of people. The timing of surveys and qualitative interviews considered women's roles, particularly in production and social reproduction, so they were not overwhelmed.

The study was conducted when people were still grappling with the psychological after-effects of COVID-19. There was also a risk of infection for both the research team and the respondents. The team put several measures in place to mitigate these risks. These included: training enumerators on health and hygiene; providing enumerators with mouth masks and sanitizers; and, where possible, conducting the interviews in the open air while adhering to strict social distancing measures, as recommended by the Ministry of Health and Child Care and the World Health Organization. Although interviews were in the open air, adequate privacy was ensured to maintain confidentiality.

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Study sites

The research was multi-sited, carried out in the following districts: Beitbridge (Matabeleland South Province), Chipinge (Manicaland Province), Chiredzi (Masvingo Province) and Tsholotsho (Matabeleland South Province) (Figure 1). These four districts were purposefully selected based on the characteristics that make them well-suited for answering the research questions. Namely, they are a combination of high migrant-sending areas, climate change hotspots and border districts. Beitbridge shares a border with South Africa and Botswana, Tsholotsho with Botswana, Chipinge with Mozambique, and Chiredzi with South Africa and Mozambique. In 2019, a total of 5 368 783 movements were recorded at Beitbridge Border Post, comprising 2 790 051 entries and 2 578 732 exits. In Manicaland, where Chipinge district is located, migration flows are mostly to and from Mozambique through Forbes Border Post in Mutare, Mt Selinda in Chipinge and Cashel in Chimanimani (IOM, 2019) and also involve circulatory cross-border trading. Table 2 shows the selected districts' socioeconomic characteristics and vulnerability to climate change.

Socioeconomic profile

Most households across the four districts experienced food insecurity (see Table 1), and only a low share of surveyed households reported acceptable levels of food security. Food security was measured using two indices: Food Consumption Score (FCS) and Household Food Insecurity Access Score (HFIAS) (Appendix, Table A.1 and A.2). The FCS reflects the frequency of consumption of different food groups during the seven days prior to the survey, and it is weighted according to the relative nutritional value of the consumed

FIGURE 1. Location of study sites

Source: United Nations Geospatial. 2020. Map of Zimbabwe. New York, USA, United Nations, modified by the author. The wards where surveys were administered are shown in red circles.

TABLE 2. Characteristics of the selected districts

Districts	Population	Household size	Drought prone classification	Climatic conditions	Main agricultural activities	Food insecurity % of household	Other important livelihoods and income sources
Tsholotsho	115 782	4.3	Mild	Natural Region 4 is characterized by low and unreliable rainfall.	**Crops** Small grains, mostly Pearl Millet **Livestock** Cattle, donkeys and goats, poultry	80–88%	• Wildlife • Tourism • Fishing • Mining • Indigenous Timber • Remittances
Beit bridge (suggested)	94 000	4.1	High- severe	Agroecological Region V	**Crops** Sorghum, Maize, Millet, watermelons **Livestock** Cattle, donkeys, goats	80%–90%	• Agricultural-related activities • Cross-border trading and activities • Crop and livestock production • Formal and informal employment, as well as casual labour • Artisanal mining • Remittances
Chipinge	375 259	3.9	Mild-high	Low-lying zone located in Agroecological Region V, Upperzone Regions 1 and 11	**Crops** Maize, Sorghum and Pearl Millet **Livestock** Goats, poultry	80%–85%	• Other crops include tea, coffee, banana and macadamia nuts. • Wildlife conservancy • Sale of small livestock • Production in irrigation schemes • Casual labour and gold panning
Chiredzi	303 503	4.2	High -severe	Semi-arid areas, lying mostly under agroecological Regions V and VB	**Crops** Maize, Sorghum, Millet, Sunflower and Cotton **Livestock** Cattle, donkeys, goats and poultry	85%–90%	• Other important livelihood activities include artisanal mining • Wildlife conservancies • Plantation agriculture for mostly sugarcane • Migrant casual labour on nearby farms and plantations • Firewood and or charcoal sales • Brick moulding • Remittances

food groups. The HFIAS is a continuous measure of the degree of food insecurity in the past 30 days, and it reflects the three universal domains of household food insecurity: anxiety about household food insecurity; insufficient quality of food supplies; and insufficient quantity of such supplies (Deitchler *et al.*, 2011). Hence, the food consumption score is a proxy indicator of household caloric availability, while the HFIAS measures the severity of household food insecurity. The percentage of households with poor FCS was higher for households without a migrant (40.6 percent) than those with a migrant (31.73 percent), but this was not statistically significant.

There was a statistical difference in land ownership and the land size under cultivation across the four districts (Table 3). Households in Tsholotsho owned bigger farmlands but did not have the most land under cultivation. Households in Chipinge had smaller land sizes and the smallest mean land size under cultivation during the 2021/22 agricultural season. The KII revealed that land sizes in Chipinge are small because the area is mountainous and overcrowded. Overall, households without migrants had more land under cultivation during the 2021/22 season than those with migrants, but this difference was statistically insignificant. Total land size under cultivation indicates household welfare status and is linked to other welfare indicators, such as income or food security.

TABLE 3. Average land size owned and land under cultivation (in acres) by household type and district during the 2021/22 agricultural season

Variables	Type of household		LOS	Districts				LOS
	Non-Migrant (n=127)	Migrant (n=375)		Beitbridge (n=126)	Chipinge (n=132)	Chiredzi (n=120)	Tsholotsho (n=124)	
Total land owned	3.04	2.83		5.60	2.47	4.89	6.46	***
Total land under cultivation	3.21	2.78		2.86	2.26	3.62	2.89	***
Standard deviation	3.9	2.76		2.99	2.55	3.88	2.72	

Notes:
* Significant at 10%   ** Significant at 5%   *** Significant at 1%

There was no statistically significant difference in terms of livestock ownership between households with and without migrants, although, overall, households without migrants tended to own more animals. There were differences across districts when it comes to the types of animals owned, but these patterns can be explained by traditional livelihoods in the respective districts (Appendix, Table A.3). For instance, Matabeleland North and South, where Beitbridge and Tsholotsho are situated, are generally known for livestock production. This was also reflected in the livestock ownership patterns in these districts: Tsholotsho households owned more cattle on average compared to the other districts, and households in Beitbridge owned more goats and donkeys than those in other districts.

FIGURE 2. Distribution of income across districts

Source: Authors' own elaboration based on the data collected for the FAO project titled 'Migration and Climate Change: Tackling Climate-Migration Challenges and Fostering Climate Adaptation' (2021-2022).

Most surveyed households had incomes below USD 500 during the 12 months prior to the study, but there were variations across the four districts (Figure 2). Over 80 percent of households in Chipinge and Tsholotsho generated less than USD 500 in the past year, while Beitbridge had the highest share of households in the higher income categories, followed by Chiredzi as the second district with most households in the higher income categories. The overall better position of Chiredzi and Beitbridge, in terms of average incomes and income distribution, can be explained by the nature of local economies in these districts, which are more diversified. Because of their proximity to South Africa, more income-generating ventures, including daily cross-border trading, are cited in both KII and FGD. One government officer in Chiredzi noted that Wards 13, 14 and 15 are actually 'Rand economies' as only the South African Rand is accepted in popular trading transactions in these wards. There was no notable difference between the income levels of households with and without migrants in the four districts, with average incomes in the past 12 months being USD 734 and USD 735, respectively (Appendix, Table A.4).

Research findings

Climate change and rural livelihoods

The study sought to establish ways in which households are experiencing climate change and the impacts this is having on their livelihoods. As shown in Figure 3, the most common changes experienced by over 90 percent of households include changes in rainfall patterns, temperature, and drought conditions. Few households experienced floods, and slightly over 60 percent experienced storms in the last 10 years. For both non-migrant and migrant households, their perceptions of changes in rainfall patterns and changes in temperatures were high, and both types of households experienced drought in the past 10 years. Overall, perceptions of climate and weather changes were almost the same between migrant and non-migrant households. These experiences were also discussed during FGDs and KII:

The climate has changed for real. What we used to know is that when it rained, it used to rain on time. Now, when it rains, rains compact the soil making it difficult for the seed to germinate. We end up wondering whether it is raining to help people or it is raining to kill people (FGD, Ward 17, Chipinge).

Rainfall patterns have changed drastically…It is clear we have climate change. We hardly ever get periods of good rain in a season since 2015. In 2011, we had drought relief, then in 2012−2014 we had better seasons, but from 2015 the government has been forced to feed people. We have mid-season dry spells. We have wards hard hit by drought…so they need food aid (KII, Government District Agronomist, Chiredzi).

FIGURE 3. **Distribution of households experiencing different manifestations of climate change**

Source: Authors' own elaboration based on the data collected for the FAO project titled 'Migration and Climate Change: Tackling Climate-Migration Challenges and Fostering Climate Adaptation' (2021-2022).

The impacts of changes in climatic and weather conditions were also linked to observed changes in agricultural productivity, as captured through qualitative interviews and focus groups. In most districts, climate change impacts such as weather extremes (heavy rains, extreme temperatures) and changes in rainfall patterns have resulted in the failure or destruction of crops. Participants explained that it is difficult to plan agriculture-related activities such as planting and harvesting due to the uncertain and unpredictable nature of rainfall patterns. The timing and distribution of rainfall has changed. Rains now fall over shorter periods, often leaving longer periods of dry spells, which prevent crops from growing.

> *Growing up, rainfall used to fall around November or early December but now it can rain at the end of December or early January…Last season [2020/2021] people planted crops, but they did not get any produce as the rain came and then disappeared leading to crops dying before they could even grow* (KII, Ward Councillor, Chiredzi).

> *Yes, there have been some changes from the time I came here in 2001. The rainfall distribution has changed…Those days we used to have a lot of rainfall starting from October up to the end of the rainy season around March-April. But now the rain can fall concentratedly over a short period. And the starting patterns have changed. Sometimes it can start very late and other times very early, and sometimes the rainfall season ends very early* (KII, Environment Officer).

> *Sometimes there is too much rain leading to the destruction of crops. The state of climate is unclear these days, it has become difficult to predict the right time to start planting. You may think there is rain, let me plant something, and then your crops will burn because of lack of rain, or you decide to wait and the one who planted early gets to harvest and you do not get anything* (FGD, Ward 12, Tsholotsho).

Floods also posed a challenge in some districts. For example, in Beitbridge, it was noted in a focus group discussion in Ward 5 that droughts killed cattle and donkeys while flash floods destroyed roads and houses and washed away livestock. Destruction by heavy rains was also experienced in Chiredzi:

> *Last year [2021], rainfall reached hundred and something millimetres a day and some crops were destroyed. Luckily, this area is not prone to floods, but because of the 'gukuravhu' [the heavy rains which washed away the soils] …the crops were washed away. And on the issue of houses, they were cracking, the roofing sheets were blown away from the roofs* (KII, District Agronomist, Chiredzi).

Participants have highlighted links between climate-related weather extremes and poverty vis-à-vis impacts on farming livelihoods. Other than material deprivation, failed livelihoods can also undermine the well-being and resilience of future generations:

> *Climate change has caused poverty in the area. There is nothing we can afford to do, farming does not give us any produce, and you cannot even sell because you do not have anyone to sell to. Even in wells, the water dries out. Poverty has become an issue… most of us are subsistence farmers, and because of poor rains we no longer harvest enough to feed our families. Poverty will cause us to fail to pay school fees. When a child reaches 13–14 years not going to school, the next stage is to get married, if it is a boy to marry* (FGD, Ward 5, Chiredzi).

Migration drivers and dynamics

Migration has been acknowledged as one potential adaptation strategy in response to changing climate and environmental conditions (Black *et al*., 2011a). The study examined whether households in the four districts are using migration to adapt when their livelihoods are affected by climate change, as well as

explored who migrates and to which destinations. Although economic hardships featured prominently in survey responses as a key factor underlying migration decisions (Figure 4), insights from the qualitative data provided a more nuanced interpretation of households' reasons. Testimonies collected through KII and FGD have shed light on the complexity of migration decisions and reaffirmed that these are the outcome of multiple interwoven factors.

FIGURE 4. Distribution of households by reason for migrating

Source: Authors' own elaboration based on the data collected for the FAO project titled 'Migration and Climate Change: Tackling Climate-Migration Challenges and Fostering Climate Adaptation' (2021-2022).

In some districts, economic conditions as the main driver of migration were also maintained during discussions with community members. This was the case, for example, in Beitbridge:

> *There are no jobs, people are struggling here… the economy is bad, the bond note has no value, so people choose to go to countries where the money has value* (FGD, Ward 5, Beitbridge).
>
> *If you leave you can get piece jobs such as picking tomatoes to get money and support the family* (FGD, Ward 5, Beitbridge).

Only in Chiredzi was drought given as the main reason for migrating by 53 percent of respondents. During qualitative discussions, this was explained mostly in terms of poor harvests due to low or lack of rainfall. Overall, agricultural output substantially declined in times of poor rains, hence causing food insecurity. Demonstrating the linkages between climate change and the decision to migrate, focus group participants in Chiredzi district's Ward 5 stated:

> *Climate change has caused drought and drought reduces the standards of living. People are becoming poor. Most of us are subsistence farmers, because of poor rains we no longer harvest enough to feed our families. So, our children end up leaving for places where they think things are better* (FGD, Ward 5, Chiredzi).

Yes there are linkages, if you take for instance Chipinge, its main economic activity is commercial farming, but due to decline in rainfall over the years people no longer cultivate crops that much, for example, you buy maize seed and it does not do well because of poor rainfall and, on the market, the grain has less value and hence we see how climate is affecting production and forcing people to leave for greener pastures" (KII, Chipinge).

Drought featured as the second most perceived migration driver in Tsholotsho, where focus group participants linked poor harvests to food insecurity and poverty:

In the past, you could farm and feed your family. Climate change now makes it difficult to make a living here. What will you eat if you stay here? Even on issues of school fees, fees need to be paid, what will you use to pay fees if there are no crops to harvest and sell? These are the reasons people find it much better to just leave the country (FGD, Tsholotsho).

In Chipinge, economic hardships, accompanying a migrant and drought were the major push factors for migration. Droughts especially affected the drier regions of the district. Therefore, life was unbearable because of persistent harvest failures, especially in the Lowveld (including parts of Wards 1–6), induced by inadequate rainfall. Migration due to economic hardships in Chipinge was explained in terms of the general economic conditions in the country and was also linked to drought conditions. Life in the district and the entire country was considered generally hard because of the lack of employment and low wages for those employed. As noted by an Agritex Officer from the district: "*If one is struggling to earn a living here, they will always want to try elsewhere, hence they leave.*"

Besides people who leave, there are also people who do not move even though they encounter both climatic and non-climatic challenges. The testimonies of key informants highlight that immobility takes place on a voluntary-involuntary continuum. Caring duties and obligations, disability, low education, risk aversion, or fear of failure are thought to be some of the reasons why some people 'decide' to stay.

Some households have old people, like when the mother and father are too old and do not have the energy to work. Some households have disabled people, who cannot afford to leave the country to go and work. Then there are others who choose to stay because they do not believe they will find jobs outside the country as they do not have adequate education, so they choose to farm for themselves or do maricho [piece jobs] (KII, Village Head, Ward 5, Chiredzi).

…you find out that when people go there [South Africa] it's risky and some people fear to take risks they don't know what the future holds for them there". A Youth Officer in Beitbridge noted that "Yes, there are some who fail to raise the money to be transported illegally and those who remain taking care of the homestead (KII, Beitbridge).

Based on the combined insights from the survey and qualitative data, we can conclude that although economic hardships were cited by most survey participants as the main reason for their migration, in most districts these were inextricably linked to climate change impacts. Most notably, declining yields were attributed partly to changing rainfall patterns and droughts affecting the study sites. Failing production led to an increase in poverty and food insecurity, driving the need and desire to search for livelihood alternatives elsewhere. However, migration is not an option or possibility equally available to everyone.

Examining the characteristics of migrants in terms of sex, age, level of education and nature of employment allowed us to understand not only who migrates but also key mediating factors of the ability to do so. Migration is a gendered process which plays out differently in diverse societies depending on local cultural norms that do not only affect and are affected by gender roles but also by age, class and ethnicity. For years, the migration literature considered migration to be a male phenomenon. This is consistent with experiences in the four districts (Table 4).

TABLE 4. Sex and the average age of migrants by district

District	% Male migrants	% Female migrants	Migrant's mean age
Beitbridge	57	43	34.93
Chipinge	72	28	35
Chiredzi	77	23	34.42
Tsholotsho	60	40	34.28
	***		

Notes:
* Significant at 10%   ** Significant at 5%   *** significant at 1%

The results show that while overall, more men than women migrate in all four study districts, the distribution of male migrants varies significantly across districts. Men were perceived to migrate more because of their roles as household heads and associated responsibilities as family breadwinners. Whereas women were less likely to migrate, because of their reproductive roles and caring obligations.

> *Yes, house chores are some of the reasons women do not migrate. Some of them would be married and staying with their in-laws, so for them to migrate leaving their in-laws – that does not work* (KII).

While in Chiredzi and Chipinge, the majority of migrants were males, in Tsholotsho and Beitbridge districts, there was a higher percentage of female migrants (40 percent and 43 percent, respectively), although still more men than women moved. Their proximity to South Africa was said to allow women to go and seek temporary work as housemaids and waitresses and still be able to come back and check on the children more often. However, as the excerpt below indicates, age and life stage also mediated these short-distance movements, and women with families were less likely to benefit from opportunities in South Africa.

> *Even if a woman wants to go, the men will say 'here we have got cows, we have got kids, you are not going anywhere, you are staying behind taking care of these things and I will go to work'. So even if she wants to go, women especially the older ones, would not migrate. It's easy for younger women with no families to go to South Africa because they won't have many responsibilities* (KII, Agritex officer).

In terms of migration destinations, other African countries emerged most prominently in the survey (Figure 5), and conversations with key informants and focus group participants revealed that the most popular African destinations are South Africa and Botswana. Only 20 percent were internal migrants, and 2 percent went to other international destinations outside Africa. Other available studies also show South Africa as one of the top destinations for Zimbabwean migrants. Chiredzi and Beitbridge wards, which border South Africa, were high sources of migrants, while from Chipinge, besides going to South Africa, migrants also went to Mozambique. However, Mozambique was perceived as a less desirable destination because it did not present a wide range of work opportunities.

To support that South Africa, in particular, is a key destination, a key informant in Chipinge noted that:

> *Here most people go to South Africa in search of employment…In Chimanimani, where there is gold, some are going there, but mostly here people go to South Africa for jobs and also to buy goods for resale.*

FIGURE 5. Destinations of migrants

Source: Authors' own elaboration based on the data collected for the FAO project titled 'Migration and Climate Change: Tackling Climate-Migration Challenges and Fostering Climate Adaptation' (2021-2022).

Those who migrated to South Africa were generally perceived to stay longer, some never coming back home regularly, while others would come back only during the holidays, such as Christmas. Proximity to the border and location were key factors that either facilitated or constrained migration to South Africa. In Chiredzi, informal migration was common among those in Wards 13, 14 and 15 as they are close to the South African border, hence they simply 'walked' into South Africa without passports required at border posts such as Beitbridge. In Beitbridge, crossing into South Africa through the border post takes more time and difficulties than crossing illegally from Chiredzi. This was supported by the Rural District Council Chief Executive Officer when he said: *"…migrants do not go through the actual border, they cross illegally because their homes are just the other side of the border."*

The majority of the migrants were employed as skilled construction workers, agricultural labourers and non-farm workers. Some worked in the service and sales sectors, while a small percentage were also unemployed or seeking employment (Appendix, Table A.5). In most cases, migrants from poor sending households lacked the required educational background or experience to be employed in high-paying jobs (Appendix, Table A.6).

Based on the information from migrants themselves, some say they work in construction, housework/maids, some in farms, so you see, most do not have good jobs due to their poor education (KII).

[F]rom what I have heard through conversations with people is that those who have their trades/ qualifications they get their jobs which they are trained for. For example, teachers or other university graduates get formal employment. Then those without relevant qualifications do vending, others do different crafts such as welding, woodwork/carpentry and some are domestic workers (KII, Chipinge).

Remittance trends and patterns

Remittances are key to fulfilling the potential of migration as adaptation and as a vehicle of rural development. The study revealed that over 50 percent of the households in all four districts do not receive remittances

at all (Figure 6). Households that did receive remittances were mostly sent up to USD 200 in the past 12 months. Few households received high remittances in the region of USD 1 000, mostly in Beitbridge and Chiredzi. Money transfer agents such as Mukuru, World Remit, MoneyGram and Western Union were by far the most common channels for sending money in the four study districts. These were perceived to be straightforward and trusted. Informal channels, such as friends or other persons, were mostly utilized in Beitbridge, which was also the district with lower utilization of formal channels relative to the other three study districts (Appendix, Figure A.1).

The frequency of receiving remittances varied, but overall, most participants reported receiving remittances on a relatively regular basis, monthly, every two months or every three months (Figure 7). Those in Beitbridge and Chiredzi were most likely to receive remittances every month, as well as receive the highest amounts in remittances. This is unsurprising since these districts are bordering South Africa, where many migrants end up. In Chipinge and Tsholotsho, households were more likely to receive remittances bi-monthly, and the amounts of remittances were lower than in the other two districts. In the Tsholotsho district, only 19 percent of the households said they received remittances every month. This was mainly because most of the migrants from this district were not formerly employed. As one village head from Ward 6 put it: *"We say our children are out of the country, but they are not working, there is nothing they can assist with."*

Therefore, various factors mediate the frequency with which migrants send remittances. Employment is one condition, but as previously noted, not all working migrants send remittances or send them regularly or frequently. For example, the main reason for sending remittances every couple of months was that the migrants did not get consistent and sufficient income. For those who sent monthly, it was noted that the nature of their job and individual attitudes were both important.

It depends on the person, some go and never look back and be just quiet there, but there are some who send something for their families, so it depends on the individual, some families benefit, and others don't. Some send groceries and money to their families back home (KII, Environmental Management Agency Officer).

FIGURE 6. **Distribution of households by remittances received**

Source: Authors' own elaboration based on the data collected for the FAO project titled 'Migration and Climate Change: Tackling Climate-Migration Challenges and Fostering Climate Adaptation' (2021-2022).

FIGURE 7. Distribution of households by frequency of receiving remittances

Source: Authors' own elaboration based on the data collected for the FAO project titled 'Migration and Climate Change: Tackling Climate-Migration Challenges and Fostering Climate Adaptation' (2021-2022).

Migration and household well-being

To understand how migration shapes households' well-being, respondents were asked what they perceived as the advantages and disadvantages of having migrants. As shown in Table 5, the most perceived disadvantages of migration include decreased income (16 percent), loss of social ties (22 percent), loneliness (10 percent), less safety and security (10.4 percent) and fear of the migrant's well-being and health (7.6 percent). These concerns were identified as most prominent by both households with and without migrants.

Participants in the qualitative study cited a loss of social ties due to migrants not communicating when they got to their destinations. These types of migrants who cut communication also did not contribute much to the welfare of their families. In Ward 17 of Chipinge, participants bemoaned, just like participants in Ward 5 in Chiredzi, that the migrants did not even join burial societies to support themselves when they passed on in South Africa.

> *Some of them die in South Africa, and people at home end up footing the bill of repatriating the corpse home for burial. The relatives in South Africa will be saying we are failing to bring the corpse and would ask for money from us (FGD, Ward 17, Chipinge).*

In Chipinge, it was overwhelmingly mentioned in Ward 17 that ties were broken between married couples, which often had negative implications for children. A key informant stated that there has also been an increase in child-headed households because both parents would leave minor children unattended or under the care of a minor housemaid.

> *In some cases, migration has caused the destruction of marriages and children are failing to go to school. There are cases of children getting into early marriages because they lack parental guidance (FGD, Ward 17, Chipinge).*

> *In some households, children were left behind. The father will go to South Africa first, for example, and when he gets there, he will ask the wife to follow. The children are then left behind alone at home. These children will have problems getting food to eat… (KII, Agritex Officer, Ward 17, Chipinge).*

TABLE 5. Distribution of households by perceptions on disadvantages of sending a migrant

Disadvantages		Households with no migrant	Households with migrants	Total
Decrease in income	N	23	58	81
	%	17.0%	15.8%	16.1%
Instability in income/irregular income	N	12	22	34
	%	8.9%	6.0%	6.8%
Unable to develop family business/farm	N	11	27	38
	%	8.1%	7.4%	7.6%
Loss of social and family ties	N	30	82	112
	%	22.2%	22.3%	22.3%
Loneliness	N	15	39	54
	%	11.1%	10.6%	10.8%
Less safety and security	N	12	40	52
	%	8.9%	10.9%	10.4%
Becoming indebted	N	3	6	9
	%	2.2%	1.6%	1.8%
Having to sell assets to finance migration	N	3	7	10
	%	2.2%	1.9%	2.0%
Fear for migrant's well-being and health	N	10	28	38
	%	7.4%	7.6%	7.6%
Loss of government/NGO benefits for the member	N	5	17	22
	%	3.7%	4.6%	4.4%
Selling or renting agricultural land due to lack of labour	N	1	10	11
	%	0.7%	2.7%	2.2%
Children drop out of school	N	4	4	8
	%	3.0%	1.1%	1.6%
Food insecurities	N	2	22	24
	%	1.5%	6.0%	4.8%
Don't know	N	4	5	9
	%	3.0%	1.4%	1.8%

Some migrant-sending households experienced a decrease in their income, especially in Chiredzi, because they lost productive labour used in maricho "piece jobs". It was noted that when these migrants were around, they would go to Hippo Valley to do piece jobs and contribute to household income. Brick moulding was one such common piece job that they would do for people in South Africa who wanted to build houses. Farming also became more challenging in the absence of men.

> *The situation is more difficult during the farming season…Farming is usually handled by men but right now if he [son] is no longer around, this makes farming a burden to me as a woman. The farming land needs to be fenced and all those things are usually done by a man. Now that he has gone away, it becomes very difficult, especially for a woman to do any meaningful farming* (KII, Village Head, Tsholotsho)*.*

These experiences echo survey findings, which revealed noteworthy differences between the perceptions of households with and without migrants on two areas of disadvantage, albeit these were much less prominent issues: households with migrants were more likely to consider food insecurity a disadvantage,

as well as they were more likely to identify selling or renting out agricultural land due to lack of labour as a challenge associated with having a migrant.

Nonetheless, an increase in incomes was cited as the most perceived advantage of households with migrants, and the share of those who perceived improved incomes as a benefit was considerably greater than those who associated having a migrant with reduced household income (48.2 percent and 16.1 percent, respectively). Also, among the most perceived benefits of migration were food security (15.9 percent), stability of incomes (7.4 percent) and better education of children (5 percent) (Table 6). The qualitative data revealed that financial remittances boosted household incomes and improved food security. Those who received money often used it to buy food, as noted by a probation officer in Chiredzi:

> *For some people it [migration] helps because some of the women who are here have got husbands who are in South Africa, they go to…Money Gram, they go there to receive their money. When they get their money, they…buy some food to eat with the family. These are some of those people who improve the food situation.*

Whether or not, and to what extent, migration improved household incomes, however, depended on the migrants' situation at their destination, as revealed by the participants' narratives. Across all the districts, participants consistently stressed that migration did not mean that the migrants would get jobs. Some migrants would be unemployed for several months, struggling to survive, hence migrant-sending households would not receive any financial support.

> *Even when the children leave the country, we do not see any difference. Some of the children go to South Africa and are just sitting there without jobs, not sending money for school fees. This leaves us to find means of raising the children's school fees* (FGD, Tsholotsho).

It was also noted that in the event of a migrant working, they were usually employed in low-paying jobs because most of them were unschooled and unskilled, as well as the available employment was generally in low-paid sectors, such as picking fruits on farms, manual work in mines and domestic work. Additionally, not all working migrants remitted money to their families or relatives back home.

Overall, when asked about the impacts of migration on households, most participants perceived these to be positive and associated migration with improved social status, learning about new ideas and practices, and improved ability to cope with climate change impacts such as floods and droughts. They also considered migration as beneficial for migrants who could obtain better education and jobs by moving (Appendix, Table A.7). However, migration also had costs, in particular, the loss of labour when working-age youth leave and maintaining rural livelihoods becomes challenging for those household members who remain, as well as negative implications for children who often drop out of school and get married early.

Migration and adaptation to climate change

The relationship between migration and adaptation was evaluated in terms of the ability of the households to cope with the effects of drought. The study explored whether remittances were responsive to climate-related shocks and whether households invested remittances with a view to building resilience to future climate change impacts.

The research found that both financial and in-kind remittances increased in amount and frequency following climate-related shocks, such as drought (Figure 9). However, the rate of increase varied across districts. For financial remittances, the highest increase, in both frequency (61 percent) and amount (67 percent), was observed in Chiredzi. In other districts, on average, around 40 percent of participants reported an increase in amounts and 35 percent an increase in frequency. The most common in-kind goods received included food, clothes, and medicine (Appendix, Table A.8). Chipinge and Chiredzi were

TABLE 6. Distribution of households by perception of the advantages of sending a migrant

Advantages		Households with no migrant	Households with migrants	Total
Increase in income	N	75	167	242
	%	55.6%	45.5%	48.2%
Stability in income/regular income	N	6	31	37
	%	4.4%	8.4%	7.4%
	N	3	11	14
	%	2.2%	3.0%	2.8%
Paid fees for own education	N	7	12	19
	%	5.2%	3.3%	3.8%
Better education for children	N	3	22	25
	%	2.2%	6.0%	5.0%
Better access to public services	N	0	3	3
	%	0.0%	0.8%	0.6%
Safety and security	N	1	3	4
	%	0.7%	0.8%	0.8%
More respect in community, improved social status of household	N	4	11	15
	%	3.0%	3.0%	3.0%
Able to invest in house (material or contents)	N	5	14	19
	%	3.7%	3.8%	3.8%
Better access to finance	N	3	6	9
	%	2.2%	1.6%	1.8%
Better health	N	2	13	15
	%	1.5%	3.5%	3.0%
Food security	N	19	61	80
	%	14.1%	16.6%	15.9%
Don't know	N	7	13	20
	%	5.2%	3.5%	4.0%
Total				

the districts with the most households (60 percent and 75 percent, respectively) that received more goods if the household was experiencing weather-related shocks (Appendix, Table A.9).

Of those households with a migrant, most perceived migration to be beneficial for their ability to cope with climate change and associated this with receiving remittances (56 percent) and, to a lesser extent, having more stable incomes (12.9 percent). Those households who perceived themselves to be worse off and less able to cope with climate change attributed this to not getting help or remittances from their migrants (57.1 percent) and to the lack of labour (14.3 percent) to maintain rural livelihoods (Appendix, Table A.10).

While remittances somewhat contributed to investing in assets that could improve resilience (e.g. drought-tolerant crops and livestock), the analysis found no significant relationship between receiving remittances and diversification (see Table 7). In fact, households with migrants and in receipt of remittances were less likely to engage in conservation agriculture, and this result was statistically significant. Overall, land under cultivation was smaller for households with migrants relative to those who did not have a migrant, albeit this difference was not statistically significant. Constraints related to translating remittances into enhancing

agricultural production and techniques can be partly explained by the loss of productive labour when mostly men migrated in search of work, as indicated by interview and focus group participants. During FGD across the districts, it was noted that, on average, the land put under cultivation is continuously shrinking because of labour shortages and lack of agricultural inputs. During qualitative discussions, it consistently emerged in all districts that remittances do not always benefit households in coping with climate change, either because the amounts sent were too low or because some migrants simply neglected their families or even brought more burdens.

> *I do not see anything changing in my village or this ward. There are no investments in the households. The people [migrants] leave their parents and children and males leave their wives. We still see them suffering and as the village head, I end up intervening with things such as food. Some can starve but they have people working somewhere. Except for a few, I do not see what these people are really doing* (KII, Village Head, Tsholotsho).

> *Our children in South Africa bring us a lot of burdens, they leave a child behind before going to South Africa and they send more children born there. Moreover, they are not even working or able to find jobs in South Africa to support the children back home* (FGD, Ward 17, Chipinge).

Nonetheless, receiving remittances was positively and significantly associated with reduced food insecurity. Remittance-receiving households worried less about food insecurity, as per the Household Food Insecurity Access Score. However, while the relationship between receiving remittances and the Household Food Consumption Score was positive, it was not statistically significant. The percentage of households with poor food consumption scores was higher for households without a migrant (40.6 percent) than those with a migrant (31.73 percent). All in all, this indicates that households that had a migrant and received remittances had better access to food, suggesting that, in effect, remittances were instrumental in meeting households' basic needs, including during periods of climate-related shocks.

FIGURE 8. **Distribution of households by changes in amount and frequency of receiving remittance**

Source: Authors' own elaboration based on the data collected for the FAO project titled 'Migration and Climate Change: Tackling Climate-Migration Challenges and Fostering Climate Adaptation' (2021-2022).

TABLE 7. Bivariate analysis

		Food Consumption Score	Food Insecurity Access Score	Drought resistant varieties	Conservation agriculture	Total land under crop cultivation	Engaged in off-farm labour	Crop livestock diversification	Household has migrants	Household running own business	Household get remittances
Food Consumption Score	Pearson Corr	1									
	Sig. (2-tailed)										
	N	502									
Food Insecurity Access Score	Pearson Corr	-0.370**	1								
	Sig. (2-tailed)	0.000									
	N	502	502								
Drought resistant varieties	Pearson Corr	0.061	0.016	1							
	Sig. (2-tailed)	0.172	0.712								
	N	502	502	502							
Used conservation agriculture	Pearson Corr	0.108*	.0129**	0.557**	1						
	Sig. (2-tailed)	0.015	0.004	0.000							
	N	502	502	502	502						
Total land under crop cultivation	Pearson Corr	0.098*	-0.028	.0198**	0.215**	1					
	Sig. (2-tailed)	0.028	0.530	0.000	0.000						
	N	502	502	502	502	502					
Engaged in off-farm waged labour	Pearson Corr	0.037	.0149**	.0168**	0.162**	-0.025	1				
	Sig. (2-tailed)	0.407	0.001	0.000	0.000	0.572					
	N	502	502	502	502	502	502				
Diversified into small livestock diversification	Pearson Cor	.0162**	-0.067	.0192**	0.195**	-0.006	0.082	1			
	Sig. (2-tailed)	0.000	0.132	0.000	0.000	0.889	0.065				
	N	502	502	502	502	502	502	502			
This household has migrants	Pearson Corr	-0.061	-0.078	-0.003	-0.077	-0.030	-0.094*	0.063	1		
	Sig. (2-tailed)	0.173	0.080	0.941	0.087	0.509	0.035	0.156			
	N	502	502	502	502	502	502	502	502		
Household running own business	Pearson Corr	0.205**	-0.141**	-0.015	-0.044	0.061	0.072	0.084	-0.005	1	
	Sig. (2-tailed)	0.000	0.002	0.743	0.326	0.171	0.108	0.059	0.916		
	N	502	502	502	502	502	502	502	502	502	
Household get remittances	Pearson Corr	0.055	-0.212**	-0.041	-0.094*	-0.023	-0.154**	0.033	0.522**	-0.047	1
	Sig. (2-tailed)	0.222	0.000	0.361	0.035	0.612	0.001	0.460	0.000	0.289	
	N	502	502	502	502	502	502	502	502	502	502

Notes:
**Correlation is significant at the 0.01 level (2-tailed).   *Correlation is significant at the 0.05 level (2-tailed).

Summary

The findings reveal that, overall, high rates of poverty in the four study districts are exacerbated by the adverse impacts of climate change on rural livelihoods. According to the ZIMSTAT Poverty, Income, Consumption and Expenditure Survey 2017 Report, 70.5 percent of the country's population were poor, while 29.3 percent were deemed extremely poor. Similarly, the World Bank (2022) highlighted that the extreme poverty rate in Zimbabwe has been increasing, reaching more than twice its 2011 level in 2020. Across all districts, the livelihoods of both migrant and non-migrant households are characterized by fragility. Most households survive on low incomes, and there is no significant difference between households with and without migrants when it comes to income levels. Among other factors, the study noted that drought and other climate-related events are contributing to the increase of poverty.

The majority of the surveyed households reported that increasingly variable and unpredictable rainfall patterns, rising temperatures, and more frequent droughts not only make it challenging to plan agricultural activities but also undermine production. In most wards in the four districts, the rainfall season was no longer predictable, with in-season rainfall cessation and dry spells becoming common. Tsholotsho, Chiredzi, Beitbridge and the valley part of Chipinge are experiencing extremely high temperatures, sometimes accompanied by heatwaves. As a result, agricultural livelihoods are negatively affected in the four districts, manifested through the destruction of crops, livestock and assets and crop failures. These findings mirror evidence from earlier studies, which show that Zimbabwe is experiencing climate change and climate variability, generally becoming warmer with more erratic rainfall patterns (Brazier, 2015; Maviza and Ahmed, 2021; Utete *et al.*, 2019; World Bank, 2020). The rise in temperatures has seen an increase in extreme weather events, such as increased droughts, which have adversely affected lives, especially in rural communities. The 2021/2022 season was characterized by poor rainfall distribution in both space and time across the country, which affected livelihood strategies, including seasonal on-farm labour, livestock sales, vegetable production and sales, harvesting, and the sale and consumption of wild produce. This, in turn, had implications for access to food and the nutrition status of households (ZIMVAC, 2022).

Thus, the uncertainties stemming from climate change made rural livelihoods challenging, and the need to seek alternative livelihoods became more acute. However, climatic factors are often intertwined with other social and economic factors, which themselves can be influenced by climate change and variability. This was the case in the four study districts where economic hardships emerged as another prominent driver of migration decisions. Muyambo and Ranga (2020) also noted that the major reason for migration to South Africa was the search for employment, given the lack of jobs in Zimbabwe. In the present study, economic hardships were inextricably linked to climate change. Due to unpredictable and insufficient rainfall, droughts and associated harvest failures, households were experiencing food and income insecurity.

All four study districts have seen relatively high rates of migration, mostly to neighbouring countries. This mirrors the general high migration trend in the country (Tevera and Crush, 2003; Maphosa, 2004). South Africa is the most popular destination, attracting large numbers of rural youth who usually find work in low-skilled and low-income sectors, such as agriculture, services, and construction. This is symptomatic of the overall low levels of education and skill training among migrants. While women are also moving, migration is still predominantly a male undertaking in all four districts. This reflects national trends, as Chereni and Bongo (2018) highlight that male migrants are the largest group in any migrant category, and the 2017 Inter-Censal Demographic Survey showed that 62 percent of all emigrants are males while 38 percent are females (ZIMSTAT 2017). Indeed, migration is not an equally available option for everyone. In the four districts, a number of intersecting variables such as gender, age, socioeconomic circumstances and life stage mediate the ability to migrate. Abede (2014) also argues that gender determines who has the freedom to move and at what point in life, and this does not favour women, particularly those from male-headed

households. In patriarchal societies such as Zimbabwe, the decision concerning who migrates, to where, and when is not always privy to women (Nyahunda *et al*., 2020).

While the role of migration in climate change adaptation is gaining traction, the findings highlight a number of limitations with regard to this potential. While remittances appear to support improved food security for migrant-sending households, migration does not translate into effective adaptation strategies. There is no evidence of investment into productive assets, and in fact, households with migrants are less likely to adopt conservation agriculture and have less land under cultivation. Overall, remittances are irregular and generally low amounts, which is not surprising considering the low-paid nature of migrants' employment and the incidence of unemployment among migrants. Nonetheless, consistent with earlier research (Le De *et al*., 2016), remittances appear to be responsive to climate shocks, as both financial and in-kind remittances increase following crises. However, while slightly over half of migrant households cited improvement in coping with drought, only a few households attributed this improvement to remittances. Nyikahadzoi *et al.* (2019) also show that migration, particularly from marginalized communities of Zimbabwe, has had a very insignificant impact on the welfare of sending households. Remittances have been shown to have a limited impact on economic development in Zimbabwe. This is attributed to a number of factors, namely that they are largely sent through informal channels, are unstable and mainly consumptive in nature (Bonga, 2020; Mishi, 2014).

Other challenges emanating from migration, such as the loss of a young, productive labour force, may also have a bearing on the potential of migration for adaptation. The findings also show that the social consequences of migration, which include high school drop-out rates, early marriage and child-headed households, could undermine the well-being and resilience of young generations and exacerbate future levels of poverty and vulnerability in rural areas. It appears that migration in the Beitbridge, Tsholotsho, Chipinge and Chiredzi districts of Zimbabwe supports improved food security, however, remittances do not reach far enough to enhance adaptive capacity and build resilience among the surveyed households.

Recommendations

Recommendations for programming

Improving social protection

It has emerged that households are suffering from economic hardships in the country. Young people, in particular, lacked employment opportunities or any other livelihood options. Households encountering droughts and other climatic extremes were also failing to cope. Under these circumstances, migration offers a possible solution. However, in the absence of education and skills, migration led most young people into precarious employment and livelihood fragility in destination areas. This highlights the need to cushion rural populations from the hardships they are encountering due to intersecting climate and economic conditions. Social safety nets, either in the form of income-generating projects or cash and in-kind social assistance, can support rural populations with adaptation in their places of origin. This can contribute to making migration an informed choice rather than an act of desperation.

Promoting investments in climate adaptation strategies

Even though financial remittances are low and sometimes irregular, there is potential for their investment in incremental strategies that can improve adaptive capacity over time. Households can invest in drought-tolerant crop varieties, water conservation technologies and conservation agriculture to better cope with the effects of climate change. Government departments, NGOs and international organizations already working in the field of climate change adaptation should assist households in developing adaptation plans and strategies using remittances.

Promoting savings schemes

Evidently, the amounts remitted are too low and often irregular, and their overall impact on households' well-being and adaptive capacity is low at the moment. In some communities, however, there are functional village money-saving schemes, with money being saved coming from various sources. Targeted approaches can be used to focus on migrant-sending households so that they can engage in money-saving schemes to preserve and expand the value of remittances they receive.

Capacity building

The study has established that the majority of households have low skill and education levels. This has implications for the employment prospects of migrants and, thus, for remittances. At the same time, lack of financial literacy and inadequate access to extension advice and training, early warning, and weather forecasts have negative repercussions for households' capacity to plan agricultural activities and make decisions about the effective use of remittances. It has been noted that widespread financial literacy can improve communities and people's lives. An increased understanding of the fundamentals of budgeting, saving, and investing could improve households' handling of the remittances they receive. In addition, households will need improved access to other types of information and skill training in order to maximize the potential of migration for adaptation.

Recommendations for policy

Facilitating safe, orderly, and regular migration

A great proportion of migrants undertake risky migration journeys, moving illegally and arriving at their destination lacking connections and jobs. This not only leaves them at the mercy of traffickers and

exposes them to associated dangers but also means that they often end up in precarious employment situations, or indeed unemployment. Through awareness campaigns and advocacy targeted at young people (mostly migrating), policy actors can promote safe migration pathways and options for migrant-sending communities. At the same time, regularized migration channels can be created through bilateral labour agreements or Memorandums of Understanding in key low-skilled sectors such as domestic work, construction and hospitality, which Zimbabwean migrants in South Africa tend to occupy (Nyikahadzoi *et al.*, 2019). Working closely with the government, NGOs and international organizations could facilitate the creation of migrant associations and brokers that facilitate the migration processes and placement of workers within key sectors. With the right legal recognition, these actors could also provide migrants with support in the form of soft loans to help ease settlement at their destinations.

Strengthen coherence and coordination between relevant policy sectors

While climate change, rural livelihoods and migration are closely linked, they are often addressed under separate policy domains. As such, to date, policy has largely failed to address the challenges associated with climate-related migration and harness the benefits it presents for climate change adaptation and mitigation. As policy actors strive to deliver on the ambitions of the Paris Agreement, the global Agenda on Sustainable Development and Africa's Agenda 2063, there is an urgent need for improved coherence and coordination between climate change, migration, rural development and agricultural policies.

Addressing the adverse drivers of migration

In order to ensure that migration is a choice rather than an act of desperation, policy needs to address the adverse drivers of migration. These go beyond risks associated with climate change and also include drivers that are social, economic or political in nature. The study revealed that economic conditions of poverty and high rates of unemployment intersected with climate change and together shaped the decision to migrate. Policy needs to recognize that migration drivers are multiple, intersecting and mutually reinforcing. For example, in the present study, economic conditions exacerbated households' vulnerability and undermined their ability to respond to climate change impacts, while the negative impacts of climate change on rural livelihoods deepened poverty and food insecurity. This calls for addressing not only climate-related drivers of migration, but also the root causes of vulnerability in rural communities.

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Appendix

TABLE A.1. Food consumption scores by household type and district

	Districts					
	Non-m igrant (n=127)	Migrant (n=375)	Beitbridge (n=126)	Chipinge (n=132	Chiredzi (n=120)	Tsholotsho (n=124)
0—21 Poor FCS	40.16	31.73	36.51	25.76	42.5	31.45
21.5—35 Borderline	35.43	41.6	35.71	38.64	39.17	46.77
above 35 Acceptable	24.41	26.47	27.78	35.61	18.33	21.77

Notes:
* Significant at 10%   ** Significant at 5%   *** Significant at 1%

TABLE A.2. Household food insecurity access by household type and district

	Districts					
	Non-migrant (n=127)	Migrant (n=375)	Beitbridge (n=126)	Chipinge (n=132	Chiredzi (n=120)	Tsholotsho (n=
Food insecurity score	22.441	21.505	20.066	20.925	22.590	22.192
Standard deviation	4.589	5.470	5.562	4.364	5.713	4.5168

TABLE A.3. Average number of livestock owned by household type and district

Livestock	Type of household		LOS	Districts				LOS
	No migrants	With a migrant		Beitbridge	Chipinge	Chiredzi	Tsholotsho	
Cattle	6.28	5.04		6.30	3.24	3.95	7.02	**
Donkeys	5.75	3.96		5.28	2.00	2.83	3.91	*
Goats	9.32	6.95	*	12.17	3.25	5.10	6.76	***
Sheep	7.30	4.54		7.72	-	3.43	4.67	
Poultry	10.97	10.70		11.11	11.29	10.29	10.06	
Pigs	3.09	5.67		2.00	5.3	3.3	13	

Notes:
* Significant at 10%   ** Significant at 5%   *** Significant at 1%

TABLE A.4. Average household incomes generated by district in the last 12 months

	Type of Household		LOS	Districts				LOS
Variables	Non-Migrant (n=127)	Migrant (n=375)		Beitbridge (n=126)	Chipinge (n=132	Chiredzi (n=120)	Tsholotsho (n=124)	
Average income	735.28	734.35		963.91	449.53	1132.11	420.31	
Standard deviation	2721.64	1658.48		1322.58	1114.05	3283.17	1424.24	

Notes:
* Significant at 10%   ** Significant at 5%   *** Significant at 1%

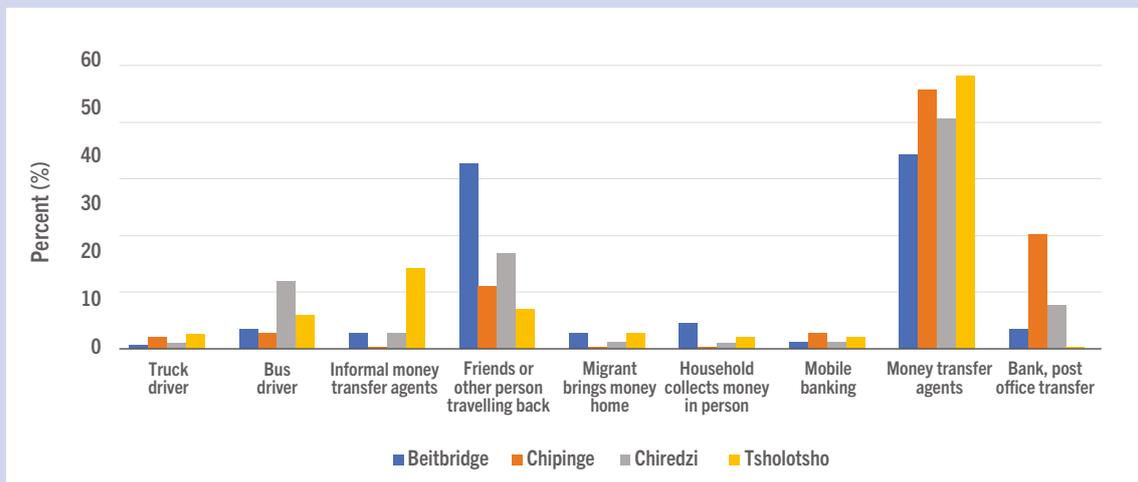**TABLE A.5. Distribution of migrants by nature of employment**

Occupations	(n)	%
Technician/professional (e.g. medical doctor)	18	3
Manager	6	1
Admin staff	6	1
Sales worker (sales/waiter/waiter/ress)	36	6
Service worker (e.g. office cleaner/security)	67	11
Paid labourer in agriculture	49	8
Transport operator	12	2
Skilled construction worker	47	8
Paid labourer (non-farm)	47	8
Production staff (textiles, electronics)	6	1
Own business (non-farm)	12	2
Domestic work	37	6
In school/education	12	2
Unemployed and looking for a job	37	6
Housewife	12	2
Don't know	192	32
Total	596	100

TABLE A.6. Distribution of respondents by education level and district

Highest education level	Beitbridge (n=137)	Chipinge (n=139)	Chiredzi (n=140)	Tsholotsho (n=180)
% with primary Grades 1—4	3	0	7	3
% with primary Grade 5—7	34	25	39	29
% with secondary Form 1—4	47	63	50	59
% with high school	7	3	1	3
% with no formal education	3	1	0	2
% with college training	3	2	2	2
% with a university degree	3	5	0	2
	100	100	100	100

TABLE A.7. Perceptions of respondents on the migration

	Agree	Neither agree or disagree	Disagree
Migration helps improve the social status of the household back home	64	15	21
Migration makes it difficult to maintain household livelihoods and responsibilities back home	52	24	24
Migration means there are not enough young people in the community back home	84	11	5
Migration brings new ideas and practices to the community when migrants return back home	55	25	20
With better employment opportunities there would be less migration	82	12	6
Migration improves the migrant's education and work opportunities	48	32	21
Households with migrants have greater economic and social security than households without migrants	54	26	21
Households with migrants are more able to cope with climate-related hazards (e.g. drought, flood)	54	27	19

FIGURE A.1. Remittance channels used by migrants to send money

Source: Authors' own elaboration based on the data collected for the FAO project titled 'Migration and Climate Change: Tackling Climate-Migration Challenges and Fostering Climate Adaptation' (2021-2022).

TABLE A.8. Proportions of households receiving different types of goods

Type of goods	% of households
Food	88
Clothing	57
Medicine	2.5
School items	5
Agricultural inputs	5
Mobile phone	3
Computer accessories	1
Household utensils	2
Other electronic appliances	1
Business items	1
Religious gifts	1

TABLE A.9. Distribution of household receiving remittances by district

	Beitbridge	Chipinge	Chiredzi	Tsholotsho
% that received goods to cope with the effects of climate change	23	33.5	53	39
% reporting migrant increase value of goods sent when the household is experiencing any weather-related shock	48	60	75	44

TABLE A.10. Contribution of migration to household's ability to cope with drought

Direction of change (subsample)	Mean scores (out of 10)			Key drivers and inhibiting forces of change	Frequency reason mentioned	
	Before migration	Today	Change		No.	%
Better off n =209	2.8	5.7	2.9	No change	16	7.7
				Children now working	1	0.5
				Receiving remittances	117	56.0
				We are working hard	2	2.0
				Financial aid	1	0.5
				We are now few	3	1.4
				Casual labour (piece jobs)	1	0.5
				Own business	6	2.9
				Stable income	26	12.9
				No remittances	29	14.2
				Other	7	3.3
				Total		100
No change n =93	3.4	3.4	0	Not receiving remittances	26	28
				Send cloth only	3	3.2
				Household head is not employed	7	7.5
				Migrant not working	10	10.8
				Casual labour	12	12.9
				Getting remittances	22	23.7
				Other	11	11.8
				Total		100
Worse off n =71	5.5	2.6	-2.9	Failure to cope with climate change	10	14.3
				No help from children abroad/no remittances	40	57.1
				No help from children abroad/no remittances	3	4.3
				High fees	3	4.3
				Don't know	2	2.9
				No manpower/labour force	10	14.3
				Other	1	1.4
				Total		100

Climate change, rural livelihoods and migration nexus
Impacts on adaptation

Rural Transformation and Gender Equality
Economic and Social Development
www.fao.org/rural-employment
www.fao.org/migration/en/

Food and Agriculture Organization of the United Nations
Harare, Zimbabwe