ENVIRONMENTAL MIGRANTS – THE FORGOTTEN REFUGEES AFFECTED BY SLOW-ONSET AND RAPID-ONSET EVENTS IN TWO CASE STUDY AREAS IN THE LIMPOPO RIVER BASIN, SOUTHERN AFRICA

Report

to the Water Research Commission

by

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Council for Scientific and Industrial Research (CSIR)

Report No. 2768/1/20

ISBN 978-0-6392-0210-5

November 2020

Obtainable from:

Water Research Commission

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EXECUTIVE SUMMARY

BACKGROUND

According to the United Nations High Commissioner for Refugees (UNHCR), the earth's climate has already started to change at a rate exceeding that predicted by scientific forecasts. Consequently, individuals, families and communities are suffering from climate-related disasters that are forcing them to leave their homes in search of better living conditions and livelihoods (UNHCR, 2019).

Worldwide, 17.2 million people were internally displaced in 2018 due to natural disasters (IDMC, 2019). In southern Africa, between 0.9 and 1.5 million internal displacements linked to climate change are predicted by 2050 (World Bank, 2018). Southern Africa is projected to continue to experience rising temperatures, often resulting in reduced rainfall or drought, which renders communities more vulnerable and therefore increases the likelihood of further displacement and migration across the region (Mambo and Faccer, 2017). The problem of climate-induced or environmental migration is increasingly being recognised as one of the foremost crises of our times (Jägerskog and Swain, 2016).

The impacts of natural disasters on displacement and migration in southern Africa are both substantial in scale and diverse in nature. Two types of disasters that frequently hit the Southern African Development Community (SADC) region are flooding, associated with tropical cyclones, and severe droughts. So, for example, Cyclone Eline resulted in the displacement of around five million people across southern Africa in 2002 (The Nansen Initiative, 2015), and Cyclone Dineo severely impacted the Inhambane and Vilanculos areas at the beginning of 2017 (AFP, 2017).

Across southern Africa, drought is a persistent and "creeping challenge" (Vogel and Van Zyl, 2016), also known as a slow-onset disaster. Some 60% of the SADC region is vulnerable to the effects of drought, which especially impact on the region's poorest and most vulnerable communities (The Nansen Initiative, 2015). Recent drought episodes in southern Africa, including the severe drought of 2015/16, which was linked to the El Niño phenomenon, have led to the displacement and migration of many people, although relatively little is known about the extent of these human movements (World Bank, 2018).

Until recently, the issue of climate-induced or environmental displacement and migration has tended to be overlooked. However, the sheer assumed size of these human movements (Weiss, 2015) has now forced political leaders to pay attention. This demonstrates the growing regional and global importance of this topic, which is increasingly finding articulation in various international frameworks.

RATIONALE

The state of knowledge on the migration-environment nexus has improved considerably over the past 10 years with the publication of flagship studies such as the Foresight: Migration and Global Environmental Change Report (2011) and the more recent Migration, Environment and Climate Change Report: Evidence for Policy (IOM, 2014). Nonetheless, the understanding of local impacts and issues, and empirical data in particular, remains limited and unbalanced. So, for instance, in these and other reports, some geographic locations have received more attention than others. Particular attention has been paid to climate migration hot spots such as Bangladesh, small island states, West Africa and the Horn of Africa, yet there is still a dearth of information on the migration, environment and climate change nexus, particularly for southern Africa (Ionesco et al., 2017).

OBJECTIVES AND AIMS

This research has aimed to address the dearth of empirical, case study-specific data on the migration, environment and climate change nexus in the southern African region in several ways. The project focused on two countries in southern Africa – South Africa and Mozambique – with the following case study sites:

- Musina and surrounding areas in the Vhembe District, Limpopo, South Africa – as an example of slow-onset events linked to cross-border migration into South Africa from other Africa countries
- Chokwe and Guija, Gaza Province, Mozambique – as an example of rapid-onset events and resultant internal displacement

Firstly, we investigated the regional, national and subnational policy landscapes and the preparedness of the South African and Mozambican governments to respond to future internal and cross-border displacements as a result of environmental disasters. On the basis of this investigation, our case study data, and international expertise on the migration, environment and climate change nexus, we have developed policy guidelines with recommendations on how to improve the capacity of these countries to respond to displacement and migration as a result of environmental disasters. These include one set of policy guidelines directed at decision makers at the SADC level, one set of policy guidelines directed at the South African government, one set of policy guidelines directed at the Mozambican government, and a set of guidelines for each case study area that takes into account the adaptive capacity of the migrants.

Secondly, the project contributed to the lack of empirical, case study-specific data on environmental migration in southern Africa by providing a detailed analysis of three components of the displacement and/or migration linked to natural disasters of our migrant research respondents. Firstly, we investigated the reasons why people move and, based on this, discuss whether they can be classified as environmental migrants. Secondly, we investigated the adaptive capacity of the migrant interview respondents in their new destination. Thirdly, we discussed the impacts, both positive and negative, of the migrants on the areas to which they have moved. Each of these sections is underpinned by an analytical framework, in the context of which we discussed the primary data, which we collected for each of the case study areas. Through this discussion, we contributed to the development of a southern African research capability on environmentally related human movement patterns and contributed to the body of research on this topic in the region.

METHODOLOGY

This project made use of a mixed method research design by including both quantitative and qualitative data collection methods for the two case study areas. In terms of qualitative data collection for the project, we made use of environmental migration-related literature to set the scene for the primary data analysis (e.g. a review report of the policy landscapes related to environmental migration in the case study areas) and to complement the findings of our primary data collection.

In terms of primary data collection, the three methods we used (as elaborated on in section 2.2.2) were surveys, semi-structured interviews and focus group discussions. These three methods were chosen to triangulate the results. The surveys provided scoping information for the broader environmental migrant population in the case study areas. This was followed up with targeted interviews with selected survey respondents to provide more in-depth information pertaining to specific issues that arose from the survey results, and that needed further elaboration by participants. Focus group discussions were held with the migrants to cross-validate the survey and interview findings in a group setting.

The primary data collection in South Africa was done by project team members from the Council for Scientific and Industrial Research (CSIR). For the primary data collection in Mozambique, we sub-consulted researchers from Edoardo Mondlane University to administer surveys and conduct interviews. All data was analysed by the CSIR project team.

The case study results and discussion section is divided into three sections. First, we present the conceptual framework developed by Renaud et al. (2011) for categorising individuals who move due to environmental stressors. This framework aims to distinguish between whether someone can or cannot be defined as an environmental migrant. Furthermore, the framework focuses on the interplay of economic, political, social and environmental stressors in shaping someone's decision to leave their home. To help explain the complexity of this interplay of stressors, the framework relies on the concepts of socio-ecological systems and ecosystem services, which we also include in our discussion (Renaud et al., 2011). After introducing the framework, we apply it to our case studies and, with the aid of our data analysis and case study findings, we reflect on which elements of our case studies the framework has been able to explain and which elements it has not been able to cover. On the basis of our discussion, we subsequently suggest some areas for future development and discussion.

For our Limpopo case study, we discuss the following topics with regard to the conceptual framework of Renaud et al. (2011): country of origin and types of migration, conditions in the place of origin, reasons for migration, and the journey to South Africa and lack of official documentation. For our Gaza Province case study, we discuss reason for displacement, and staying in the resettlement camp vs returning to the original place of living. We subsequently reflect on a number of ways in which the conceptual framework of Renaud et al. (2011) fell short of explaining the situations pertaining to environmental migration and displacement in our two case study areas.

Secondly, we investigate the ability of migrants to adapt in the place to which they have moved through an adaptive capacity lens. Here, we focus on the concept of adaptive capacity from a theoretical perspective, followed by the introduction of a conceptual framework to determine and assess adaptive capacity in our case study areas.

In order to examine the two case studies through an adaptive capacity lens, we make use of the framework suggested by the Overseas Development Institute (ODI) (Jones et al., 2010) called the Local Adaptive Capacity Framework (LAC). The LAC is ideal for our case study analysis as it deals specifically with communities and individuals at local level and takes into account the role of the processes and functions that can support adaptive capacity (Jones et al., 2010). The LAC comprises five adaptive capacity elements: asset base, institutions and entitlements, knowledge and information, innovation, and flexible, forward-looking decision making and governance. Subsequently, we apply the LAC to each of our case study areas, and discuss adaptive capacity in the case study areas along the lines of the five elements of adaptive capacity.

Thirdly, we investigate the positive and negative impact of environmental migration on our Limpopo and Gaza Province case study areas. For this analysis, we refer to the schematic representation of Abel et al. (2019) of the interplay between climate, conflict and forced migration, with a specific focus on the impact of migration on conflict over scarce resources, and demographic pressures in the destination area.

RESULTS AND DISCUSSION

Our case study analysis yielded the following results:

- In line with the views of other authors, we confirm that it is very difficult to study migration linked to slow-onset events due to the multiplicity and complexity of factors influencing migration in such cases. On the basis of our Limpopo case study, we have found that, in most cases, it is impossible to attribute cross-border migration into South Africa exclusively to environmental reasons.

Nonetheless, we reiterate the importance of studying such cases, even if they cannot be classified as “pure” environmental migration. This is because of the increasing prominence of environmental stressors on people’s livelihoods linked to climate change, and particularly in countries that are also characterised by political instability and severely limited economic opportunities. This research project has been a start in doing research in this direction, particularly in the southern African context, but considerably more remains to be done.

- We have found that a major problem regarding the impact of migration in general, and specifically environmental migration on the Limpopo case study area, is the lack of reliable data on how many international migrants reside in South Africa. Statistics South Africa estimated the number of foreign-born nationals living in South Africa to be 2.2 million in 2011, while the United Nations estimated the number to be 3.14 million in 2015 and 4 million in 2017. Other sources, noticeably the media, have put the number to be much higher. This uncertainty causes considerable confusion about the number of international migrants residing in South Africa, but also makes it impossible to ascertain their actual impact on urban areas and related services, as well as to plan for and address such impacts. Furthermore, such uncertainty fuels dangerous rumours and, in turn, results in the aggravation of xenophobic sentiments, as witnessed in the recent renewed outbreaks of xenophobia across South Africa. We therefore argue for the need for considerably more rigorous and robust research to try to determine migrants’ impacts – both positive and negative – on the South African economy and other services and systems within the country.
- Given that labour migration into South Africa is an age-old phenomenon, and given the continued attraction of South Africa as a destination by people from other African countries, a securitised “keep out” policy is likely to only have limited success. The government’s intentions to document and regularise international migrants already in South Africa is probably a step in the right direction, and can be supported by various initiatives, such as strengthening and improving upon existing formalised labour exchange programmes outside the normal general work permit procedures. An example is the current Zimbabwean Exemption Permit, which legalises Zimbabweans living, working and studying in South Africa. Here, and this relates to the previous point, it is also important to look at the positive aspects of international migration (even of low- and medium-skilled migrants), who often come into South Africa with an entrepreneurial spirit and willingness and eagerness to work, which opens up opportunities to contribute to the South African economy. At the same time, given the undisputed social, economic and political burden of hosting substantial numbers of foreign nationals, embracing migrants is not something the South African government should have to do on its own. Here, and in accordance with regional and global frameworks that address the issue of migration and environmental migration, the government should try to look outside its borders for bilateral, regional and third-country or donor support to help shoulder the responsibility of hosting foreign nationals who have moved for environmental and other reasons.
- A prominent finding in the Mozambican case study has been the adaptive capacity of people who were resettled to drought-prone, high-lying areas, noticeably the Chiaquelane resettlement area in Chokwe District, and who now commute between their fertile original lands and these areas to try to continue to make a living off the land. While the Mozambican government has expressed a concern about people returning to their areas of origin, it should perhaps try to embrace such movements and develop ways of enabling people to benefit from both their areas of origin and the safe havens to which they have been resettled, for example through secure tenure of both parcels of land. An alternative may be to further develop the resettlement areas by providing more economic opportunities, amenities and services to make them more attractive to stay in. This could be done by further building on the infrastructural development that has taken place in Chinhacanine. Introducing additional infrastructure can also take the form of adaptive infrastructure whereby below-the-ground floodwater is captured to reduce the impact of flooding and which can be extracted during drier periods, and to recharge ground water reserves (Petja, 2017) or through the construction of drainage ditches to accommodate flood flows (Twumasi et al., 2017).

CONCLUSION

This project contributed to addressing the dearth in empirical data on environmental migration in southern Africa by providing rich and detailed theory-based case study analyses of two southern African case studies, as well as covering migration linked to slow-onset and rapid-onset environmental factors. Our analyses therefore make a valuable contribution to existing literature on the topic of environmental migration.

Based on our case study analysis and the contributions of international expertise on the topic of environmental migration, we developed six guidelines to help policy makers better understand the concept of environmental migration within their particular context (SADC, South Africa and Mozambique). We furthermore set out a number of context-specific policy recommendations to enable decision makers to better respond to the challenges of environmental migration.

Based on our study, we have identified a number of areas for further investigation:

There is a need to further disentangle the complexity of studying migration influenced by slow-onset events. Because of its “creeping” nature, the effects of drought occur slowly over an extended period. As a result, the onset and the end of drought are difficult to determine, making it even more challenging for scientists and policy makers to agree “on the basis of declaring an end to drought” (Wilhite et al., 2014). Similarly, as a result of its protracted nature, it is often difficult to determine related migration or mobility patterns, as there is no sudden displacement of a critical mass of people. It is also one of the most difficult to predict because of the types of migration (seasonal, return, repeat, permanent and temporary), the multi-causality of intervening variables (socio-economic status and migrant selectivity) and the complexity of environmental outcomes (deforestation and fisheries depletion) (Curran, 2002).

Environmental factors will always be one of several that contribute to the decision to migrate in the case of slow-onset events, and may not be the main reason behind somebody’s decision to migrate. Nonetheless, even if environmental factors only constitute a contributing reason for migration, this does not justify ignoring their influence (Warner et al., 2009). This is especially the case because climate change, and in particular drought, is predicted to exert a growing and progressively severe influence on the southern African region (Mambo and Faccer, 2017). This research project has provided some insights into the influence of environmental factors on people’s decisions to migrate, but considerably more needs to be done in this regard, also linked to considerations of households’ adaptive capacity and resilience.

More research is needed on cross-border environmental migration and displacements. While the number of internal displacements within the borders of countries as a result of environmental factors is well documented, noticeably by the Internal Displacement Monitoring Centre (IDMC) (2019), very little data and analysis exist about cross-border displacements and migration as a result of environmental factors (Mcauliffe and Klein Solomon, 2017). An additional factor that complicates the study of cross-border displacements is irregular and undocumented migration. Given that southern Africa has a history of cross-border labour migration, and given the dire economic and political conditions in some of South Africa’s neighbouring countries (e.g. Zimbabwe and Mozambique), cross-border migration is an important topic in the context of the southern African region.

Remittances turned out to be a topic of great importance in our research in terms of strengthening the adaptive capacity of individuals and households who had moved away from their places of origin. With a particular focus on environmental migration, it is important to establish how remittances are used in communities of origin to offset the negative impacts of droughts and flooding. Examples include drilling boreholes to access water for irrigation during droughts, reinforcing housing infrastructure to better withstand flooding, or buying food to sustain livestock during dry periods.

A research topic of arguably national importance to South Africa is to develop an accurate picture of the real impacts (both positive and negative) of international migrants on the infrastructure and services of the places to which they relocate. A better understanding of these impacts is crucial to being better able to manage them, but also to avert emotional reactions to the perceived negative influences of international migrants, which have contributed considerably to several spates of xenophobic attacks in South Africa.

ACKNOWLEDGEMENTS

The authors would like to thank the Reference Group of the WRC Project K5/2768/2 for the assistance and constructive discussions for the duration of the project:

- Dr Chris Changwe Nshimbi (University of Pretoria)
- Dr Nelson Odume (Rhodes University)
- Mr Donavan Pietersen (Council for Scientific and Industrial Research)
- Prof Johann Tempelhoff (North West University)

We furthermore thank the United Nations High Commissioner for Refugees in South Africa and the International Organisation for Migration in South Africa for their excellent guidance during the starting phase of the project. Thank you also to all the research participants who gave of their time and insights, without which this report would not have been possible.

Special thanks also goes to the Council for Scientific and Industrial Research for providing considerable co-funding to the project.

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LIST OF ABBREVIATIONS

CSIR	Council for Scientific and Industrial Research
DRC	Democratic Republic of Congo
ETC	Emergent thematic coding
GDP	Gross domestic product
IDMC	Internal Displacement Monitoring Centre
IGO	Intergovernmental organisation
ILO	International Labour Organisation
IMF	International Monetary Fund
INDC	Intended Nationally Determined Contributions
IOM	International Organisation for Migration
IPCC	Intergovernmental Panel for Climate Change
LAC	Local Adaptive Capacity Framework
MECC	Migration Environment and Climate Change
MECLEP	Migration, Environment and Climate Change: Evidence for Policy
NACI	National Adaptive Capacity Index
NGO	Non-governmental organisation
OCHA	Office for the Coordination of Humanitarian Affairs
ODI	Overseas Development Institute
OECD	Organisation for Economic Cooperation and Development
SADC	Southern African Development Community
SDGs	Sustainable Development Goals
SPSS	Statistical Package for the Social Sciences
Stats SA	Statistics South Africa
UN	United Nations
UNCHR	United Nations High Commissioner for Refugees
WRC	Water Research Commission

CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE PROJECT

1.1 RATIONALE AND PROBLEM DEFINITION

According to the United Nations High Commissioner for Refugees, the earth's climate has already started to change at a rate exceeding that predicted by scientific forecasts. An overwhelming majority of actively publishing climate scientists agree that climate change is an indirect consequence of human activity (also known as anthropogenic climate change) (NASA, 2020) and results in the degradation of ecosystem services (Renaud et al., 2011). In particular, climatic pressures can lead to the loss of provisioning services (such as land, food, fibre, fuel and freshwater) and regulating services (such as air quality maintenance, climate and water regulation) (Renaud et al., 2011). Consequently, individuals, families and communities are suffering from climate-related pressures and disasters, which are forcing them to leave their homes in search of better living conditions and livelihoods (UNCHR, 2019).

Worldwide, 17.2 million people were internally displaced in 2018 due to natural disasters (IDMC, 2019) (see Figure 1-1). In southern Africa, between 0.9 and 1.5 million internal displacements linked to climate change are predicted by 2050 (World Bank, 2018). Southern Africa is projected to continue experiencing rising temperatures, often resulting in reduced rainfall or drought, which renders communities more vulnerable and therefore increases the likelihood of further displacement and migration across the region (Mambo and Faccer, 2017). The problem of climate-induced or environmental migration is increasingly being recognised as one of the foremost crises of our times (Jägerskog and Swain, 2016).

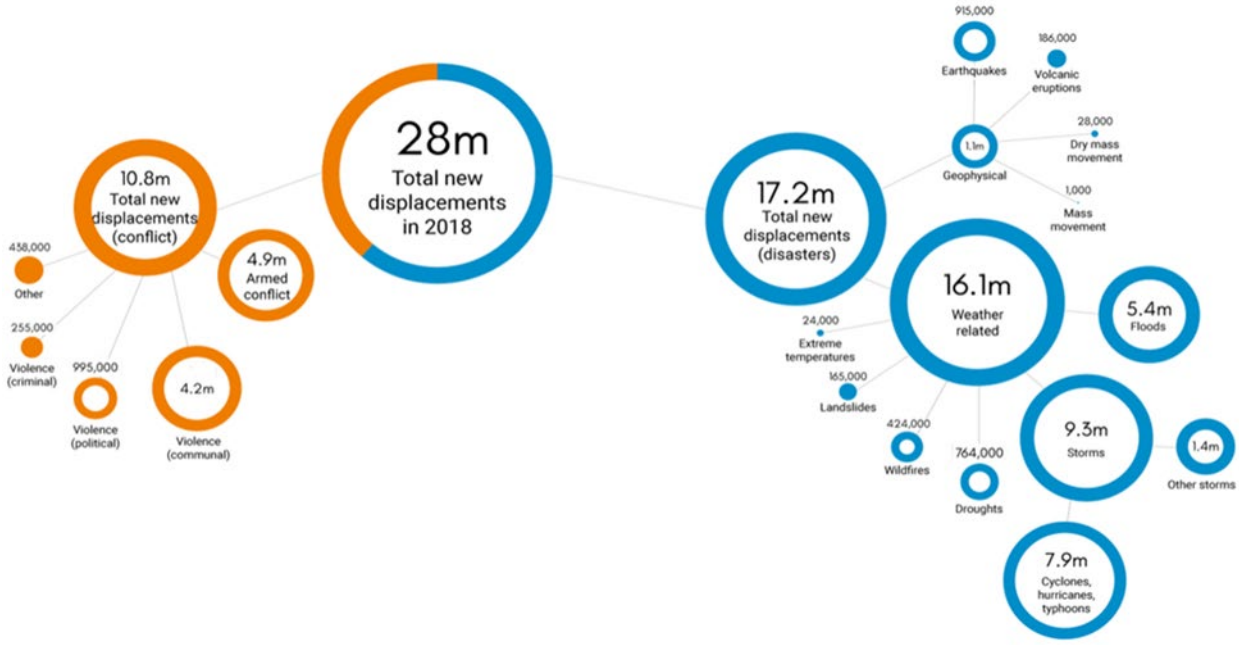

Figure 1-1: Total new internal displacements in 2018, including total new displacements as a result of disasters (IDMC, 2019)

The impact of natural disasters on displacement and migration in southern Africa is both substantial in scale and diverse in nature. Two types of disasters that frequently hit the SADC region are flooding, associated with tropical cyclones, and severe drought. So, for example, Cyclone Eline resulted in the displacement of around five million people across southern Africa in 2002 (The Nansen Initiative, 2015).

Across southern Africa, drought is a persistent and “creeping challenge” (Vogel and Van Zyl, 2016), also known as a slow-onset disaster. Some 60% of the SADC region is vulnerable to the effects of drought, which especially impact on the region’s poorest and most vulnerable communities (The Nansen Initiative, 2015). Recent drought episodes in southern Africa have led to the displacement and migration of many people, although relatively little is known about the extent of these human movements (World Bank, 2018).

Until recently, the issue of climate-induced or environmental displacement and migration has tended to be overlooked. However, the sheer assumed size of these human movements (Weiss, 2015) has now forced political leaders to pay attention. This demonstrates the growing regional and global importance of this topic, which is increasingly finding articulation in various international frameworks.

The First Assessment Report of the Intergovernmental Panel for Climate Change (IPCC) in 1992 predicted that climate change would have a serious impact on human migration. This prediction was reiterated in the IPCC’s Fifth Assessment Report (IPCC, 2014). Five years later, at the September 2015 Sustainable Development Summit, United Nations (UN) member states adopted the Sustainable Development Goals (SDGs), which are 17 international goals to eradicate poverty, combat inequality and injustice, and address climate change by 2030. These goals integrate migration policies in broader development strategies (UN, 2019). Additionally, the Sendai Framework for Disaster Risk Reduction 2015–2030, which is adopted by 187 states, takes human mobility into account (UNDRR, 2019). More recently, the Global Compact for Safe, Orderly and Regular Migration, which is the first intergovernmentally negotiated agreement that covers dimensions of international migration in a holistic and comprehensive manner, was adopted by a majority of UN member states in December 2018 (IOM, 2019).

The state of knowledge on the migration-environment nexus has improved considerably over the past 10 years with the publication of flagship studies such as the Foresight: Migration and Global Environmental Change Report (2011) and the more recent Migration, Environment and Climate Change Report: Evidence for Policy (IOM, 2014). Nonetheless, the understanding of local impacts and issues, and empirical data in particular, remains limited and unbalanced. So, for instance, in these and other reports, some geographic locations have received more attention than others. Particular attention has been paid to climate migration hot spots such as Bangladesh, small island states, West Africa and the Horn of Africa, yet there is still a dearth of information on the migration, environment and climate change nexus, particularly for southern Africa (Ionesco et al., 2017).

In response, this research project has aimed to investigate the impact of environmental displacement and migration in southern Africa, and particularly in South Africa and Mozambique. For South Africa, it has focused on cross-border migration into South Africa from other African countries across the Beitbridge border with Zimbabwe, linked to slow-onset disasters or threats such as drought and loss of ecosystem services. For Mozambique, it investigated internal environmental displacement as a result of the massive flooding of the Limpopo River in 2000 and 2013 in the Chokwe and Guija districts of the Gaza Province.

We addressed this research focus in several ways. Firstly, we investigated the regional, national and subnational policy landscape and the preparedness of the South African and Mozambican governments to respond to future internal and cross-border displacements as a result of environmental disasters. On the basis of this investigation, the case study data and international expertise on the migration, environment and climate change nexus, we developed policy guidelines with recommendations on how to improve the capacity of these countries to respond to displacement and migration as a result of environmental disasters. These included one set of policy guidelines directed at decision makers at the SADC level, one set of policy guidelines directed at the South African government, one set of policy guidelines directed at the Mozambican government, and a set of guidelines for each case study area that takes into account migrants’ adaptive capacity.

In addition, this project acknowledges the evolution of global discourse from viewing migration as a problem that reflects a failure to adapt to changes in the physical environment to migration as a key adaptive response to climate change. There has also been an emerging understanding of the role of local and national institutions in supporting and accommodating mobility. However, most governments still tend to focus migration policies on reducing pressures to migrate, managing authorised movements, and controlling irregular flows. Migration therefore continues to be framed as a threat to national security and stability, with claims that mass migratory flows lead to competition for natural resources and services, social unrest and conflicts (Mcauliffe and Klein Solomon, 2017).

Furthermore, the project contributes to the lack of empirical, case study-specific data on environmental migration in southern Africa by providing a detailed analysis of three components of the displacement and/or migration linked to natural disasters of the migrant research respondents. Firstly, we investigate the reasons why people move and, on the basis of this, discuss whether or not they can be classified as environmental migrants. Secondly, we investigate the adaptive capacity of the migrant interview respondents in their new destinations. Thirdly, we discuss the impacts, both positive and negative, of the migrants on the areas to which they have moved. Each of these sections is underpinned by an analytical framework, in the context of which we discuss the primary data that we collected for each of our case study areas, with supplementary information from relevant literature where necessary. Through this discussion, we contribute to the development of a southern African research capability on environmentally related human movement patterns and contribute to the body of research on this topic in the region.

1.2 KEY DEFINITIONS AND DIMENSIONS PERTAINING TO THE CONCEPT OF ENVIRONMENTAL MIGRATION

According to the 1951 Refugee Convention, a refugee is a person who flees their home country due to a “well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion” (The UN Refugee Agency, 2019). This definition, under international law, therefore excludes those displaced for environmental reasons.

While the term environmental refugee is sometimes used in academic papers, it is mostly found in newspaper articles and publications targeted at a wider audience. Implementation agencies such as the International Organisation for Migration (IOM), the Office for the Coordination of Humanitarian Affairs (OCHA) and others have stated that using the term ‘‘refugee’’ in relation to environmental stressors is problematic (Guterres, 2008). This is because “nature” and “the environment” cannot be seen as being responsible for persecution, as per the 1951 definition of the Refugee Convention, and therefore cannot be interpreted as being entities that intend to harm affected communities, which is often considered to be a component of the definition of persecution (Hathaway, 1991). Also, importantly, governments that sign the Refugee Convention agree to offer protection and assistance to those who have been awarded refugee status. This assistance includes funding and resources from the receiving states, and several governments are concerned that these resources might be diluted if more people (including people who are displaced or migrate due to environmental reasons) were granted refugee status (Renaud et al., 2011).

For the reasons discussed above, the IOM prefers to use the term environmental migrants, who are defined as “persons or groups of persons who, predominantly for reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently, and who move either within their country or abroad” (IOM, 2014).

Importantly, environmental migration can be forced and voluntary, temporary and permanent, internal (domestic) and international (cross-border), without forgetting the flip side, i.e. the forced immobility of many populations, trapped by the impacts of environmental change and/or poverty.

The term environmental migration can be interpreted as being a political construct that is useful for highlighting the growing importance of environmental degradation as a factor of migration. Additionally, in order to obtain more conceptual clarity, there are noteworthy nuances that deserve further elaboration pertaining to forced vs voluntary migration, migration as a result of rapid- vs slow-onset events, trajectories and timeframes.

The first important distinction is between voluntary and forced migration. Certain forms of mobility are chosen, whereas others contain an element of coercion that threatens survival and forces people to move (Ionesco et al., 2017). In this regard, the term environmentally displaced person becomes relevant. According to the IOM (2014), environmentally displaced persons are “persons who are displaced within their country of habitual residence or who have crossed an international border and for whom environmental degradation, deterioration or destruction is a major cause of their displacement, although not necessarily the sole one”. A range of factors determines whether migration is forced or voluntary, e.g. the presence of social capital, access to information and the appreciation of risks, and the ability or inability of people to resort to migration as a response to natural disasters. Often the most vulnerable, either because they are the poorest or the most exposed, do not have the means to migrate, despite wanting to do so (Ionesco at al., 2017).

The notion of “planned relocation” further complicates this debate. Planned relocation refers to persons whose livelihoods have been rebuilt in another place. Such relocation has also been defined as the “permanent (or long-term) movement of a community (or a significant part of it) from one location to another, in which important characteristics of the original community, including its social structures, legal and political systems, cultural characteristics and world views, are retained: the community stays together at the destination in a social form that is similar to the community of origin” (IOM, 2014). The concept of planned relocation further blurs the lines between forced and voluntary migration because some people may need to be relocated as the areas in which they are living have been rendered uninhabitable, while others are asked to leave because their living areas are rendered inhospitable due to climate change, infrastructure projects or by recurrent disasters. These issues raise the question of whether an evacuation is voluntary or forced.

The voluntary vs forced migration debate is not only a semantic one, but also causes problems for the recognition of environmental migrants under international law. Ionesco et al. (2017) argue that terminology is at the heart of political responses that can be employed to manage migration, while respecting human rights. The ambiguity that persists between the notions of forced and voluntary migration also prevents the creation of an internationally recognised legal term to characterise environmental migrants (Ionesco et al., 2017). If the term “environmental migrant” does not exist in any international legal framework, then no mechanism exists to provide them with support when migrating.

The second important distinction is between a rapid-onset event and a slow-onset event. Here, distinctions exist between slow-onset environmental changes, such as desertification, a rise in sea level and soil degradation, and rapid-onset changes, such as tropical cyclones, heavy rains and floods, and disasters such as earthquakes and volcanic eruptions. This differentiation is useful because it highlights the different ways in which environmental disasters (be they rapid- or slow-onset) prompt people to move and the different mode or pace of action that can be taken by the affected person(s) (Renaud et al., 2011). In this regard, it can assist with determining the type of assistance and intervention required, identifying who will be most in need of immediate support from either national governments or international aid agencies, and planning for resource allocation at a time of crisis or to prevent a crisis (Renaud et al., 2011). Another dimension of the distinction between rapid-onset and slow-onset disasters is in terms of the complexity involved in studying and developing an understanding of the migration linked to either of these types of disasters.

Migration linked to rapid-onset events is arguably less difficult to study and analyse due to the obvious and visible nature of such an event. Typically, rapid-onset events, such as floods, are characterised by sweeping environmental and infrastructural damage, which often results in the environmental displacement of hundreds of thousands of people. An example of such an event is the flooding of the Limpopo River in Mozambique in 2013, which left 150,000 people displaced in the Gaza Province alone (Humanitarian Country Team for Mozambique, 2013). After the occurrence of a rapid-onset event, some victims are able to return to their homes, depending on the extent to which the recovery of the "social, economic and physical" characteristics of the affected area has been rapid and effective, or rather slow and ineffective (Warner, 2010; Renaud et al., 2011).

In contrast, slow-onset events such as drought and the loss of ecosystem services are described as "creeping" phenomena, which occur slowly and over a protracted period of time. The creeping nature of such events can complicate matters for scientists and policy makers as, for example, they can find it very difficult to agree on the point in time at which a drought has ended (Wilhite et al., 2014). This also makes it difficult to plan for and respond to such a phenomenon. Relatedly, it is also difficult to determine the impact of slow-onset events on the migration of people as, unlike with a flood, there is no sudden and forced displacement of large numbers of people. In this regard, authors have argued that environmental degradation, if proven, is only one of several factors that affect migration (Renaud et al., 2011). Nonetheless, even if environmental factors only constitute a contributing reason for an individual's decision to migrate, this does not justify ignoring the phenomenon (Warner et al., 2009). As shown earlier, climate change, and in particular drought, is predicted to exert a growing and progressively severe influence on the southern African region (Mambo and Faccer, 2017).

The third important distinction in migration patterns is one of trajectories. The bulk of environmental migration tends to take place within a country's borders, i.e. internal migration or displacement. As Ionesco et al. (2017) note, disasters usually result in proximity displacement, i.e. people evacuate temporarily with the aim of returning and rarely travel far. People with far-reaching social networks may, however, be able to move further distances to seek support from friends and relatives living in other cities. When slow-onset environmental changes affect livelihoods that are dependent on local natural resources, e.g. fish in rivers or grass for cattle, communities frequently migrate to other regions within the same country as is often the case with pastoral communities throughout Africa. The distances that people are able to move is often also dependent on the type and scope of environmental issues, household characteristics, the attractiveness of conditions at the place of destination, alternative options available to households, distance and connectivity, and policy frameworks (Ionesco et al., 2017). Despite most environmental migration being internal, many people also cross international borders in search of protection and assistance. While some examples of cross-border displacements are well documented, the overall number of cross-border displacements and migration as a result of environmental factors is unknown (Mcauliffe and Klein Solomon, 2017). An additional factor that complicates the study of cross-border displacements is irregular and undocumented migration. Given that southern Africa has a history of cross-border labour migration, and given the dire economic and political conditions in some of South Africa's neighbouring countries (e.g. Zimbabwe and Mozambique), cross-border migration is an important topic in the context of the southern African region.

The fourth distinction worth noting is one of timeframes. Environmental migration takes many forms, from shorter daily movement, to longer or permanent migration, and from temporary evacuations to protracted displacement (Ionesco et al., 2017). Temporary and circular migration has been a traditional way to adapt to seasons in many African communities where, for example, pastoralists have engaged in seasonal transhumance, moving their livestock to summer and winter pastures. These movement patterns have been gradually altered by climate change as drought increasingly forces pastoralists to find new routes or to travel further distances. In the context of disasters, people are usually temporarily displaced to evacuation or displacement centres and shelters, where they can find support until they are able to return home or find an alternative long-term solution (Ionesco et al., 2017).

There are, however, cases where temporary displacement has turned into protracted displacement when people have been unable to return home and have remained in temporary shelters for months and even years. The IDMC has identified over 715,000 people living in protracted displacement worldwide, many of whom have been displaced since the 1980s (Ionesco et al., 2017). Governments are not always able to implement lasting solutions for return or resettlement, and cannot clarify unclear land rights or unsafe environmental conditions at the places of origin, or have limited funding capacity. The result is that thousands of people remain in precarious situations, living in ageing temporary structures, unsafe houses or overcrowded townships.

CHAPTER 2: METHODOLOGICAL APPROACH

2.1 CASE STUDY SELECTION

The project focused on two countries in southern Africa – South Africa and Mozambique – with the following case study sites:

- Musina and surrounding areas in the Vhembe District, Limpopo, South Africa – as an example of slow-onset events linked to cross-border migration into South Africa from other Africa countries
- Chokwe and Guija, Gaza Province, Mozambique – as an example of rapid-onset events and resultant internal displacement

The two case studies were selected for several reasons. Firstly, they were chosen because they are located in different geographic areas within the southern African region, which fall under different governments. This has made it interesting to study the different policy landscapes of South Africa and Mozambique as they pertain to environmental migration, and to gauge how these two countries plan for and respond to natural disasters in different and sometimes complementary ways. Secondly, the two case studies feature different types of environmental events: rapid-onset and slow-onset events. While for the South African case, cross-border migration into South Africa linked to slow-onset events (primarily drought) was studied, Mozambique presented an interesting case of internal displacement and planned relocation as a result of (repeated) massive flooding of the Limpopo River. The former made for a fascinating, but complex case study, as drought is often only one of the factors "pushing" individuals to migrate to South Africa. However, as is discussed further on, it is a crucial factor. Thirdly, the two case studies exhibit different degrees of voluntary vs forced migration in the context of environmental factors. While many of the research respondents coming into South Africa stated that they were left with no other choice but to move, their act of migrating differs from that of disaster displacement as a result of the rapidly rising flood waters in the Gaza Province, which swept away people, livestock, homes and belongings. Finally, while the South African case study looks at the complex and emotionally fraught issue of often illegal and undocumented cross-border migration and its impacts, the Mozambican case study is focused on internal displacement within the Chokwe and Guija districts, as well as the challenge faced by the government of people returning to practice agriculture and/or to live in their flood-prone areas of origin.

2.2 METHODOLOGICAL APPROACH TO STUDYING THE IMPACT OF ENVIRONMENTAL MIGRANTS IN SOUTHERN AFRICA

2.2.1 Research design

This project made use of a mixed method research design in the sense that it included both quantitative and qualitative data collection methods for the two case study areas. In terms of qualitative data collection for the project, use was made of environmental migration-related literature to set the scene for the primary data analysis (e.g. a review report of the policy landscapes related to environmental migration in the case study areas), and to complement the findings of the primary data collection.

The three main primary data collection methods used (as elaborated on in section 2.2.2) were surveys, semi-structured interviews and focus group discussions. These three methods were chosen to triangulate the results. The surveys provided scoping information for the broader environmental migrant population in the case study areas. This was then followed up with targeted interviews with selected survey respondents to provide more in-depth information pertaining to specific issues that arose from the survey results, and that needed further elaboration by participants. Households were taken as the unit of analysis for the survey, while the qualitative component considered individual and community effects. A focus on households enabled an analysis of all types of households – origin, destination, return and whole-household in-migration – and the effects of migration on those households.

Interviews were also conducted with intergovernmental organisations (IGOs), government representatives at the national, provincial and local levels, non-governmental organisations (NGOs) and academia in both countries. Focus group discussions were held with the migrants to cross-validate the survey and interview findings in a group setting.

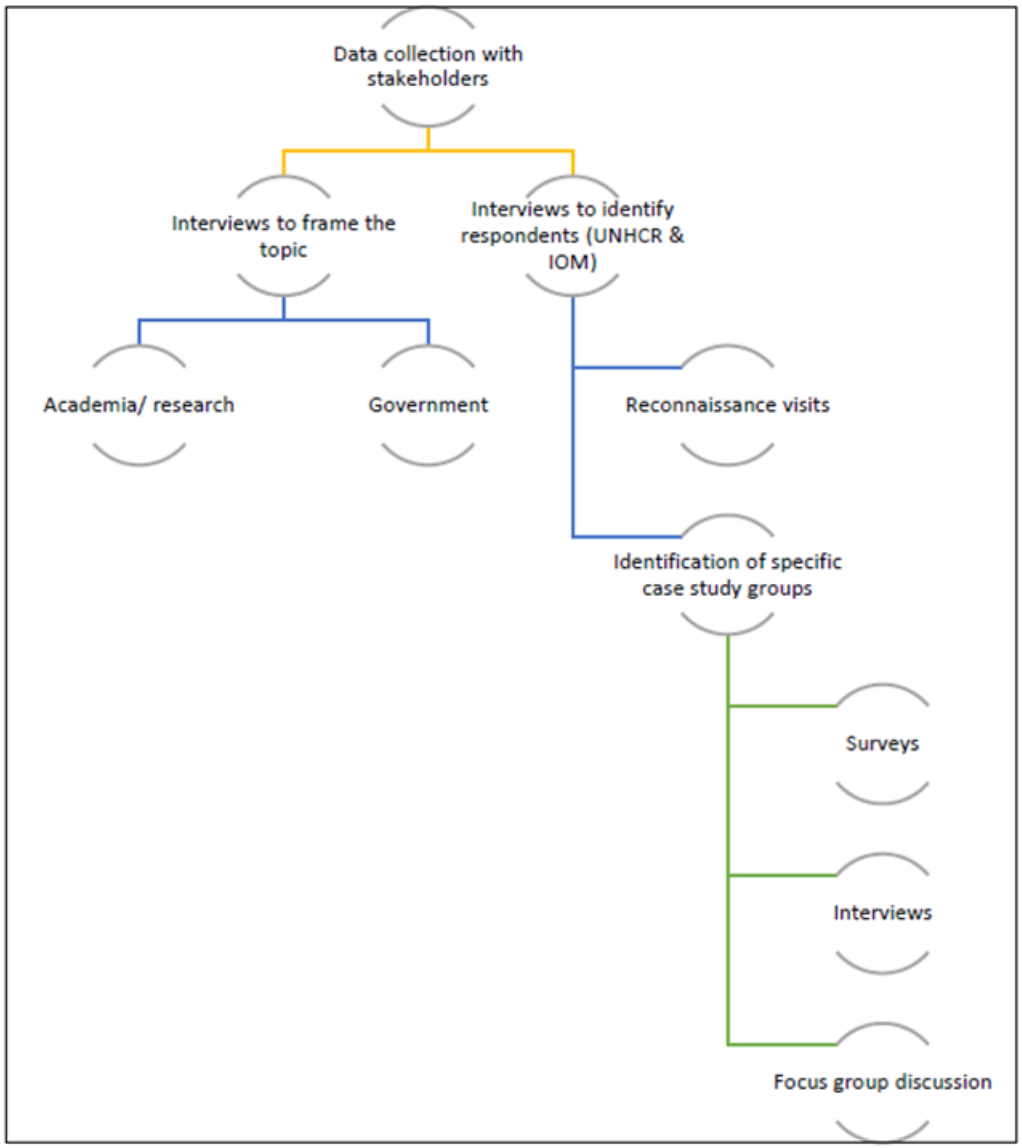

Figure 2-1: Conceptual representation of the research design for the project

2.2.2 Data collection and analysis

a. Surveys

The surveys that were conducted with the migrants aimed to determine the experiences of these migrants, and the extent to which environmental factors had forced them to relocate. The sampling technique adopted for the study was non-random, purposeful and snowballing sampling. Purposeful sampling is a non-random selection of participants based on purpose. The variables according to which the sample is drawn up are linked to the research question. Purposeful sampling is widely used in qualitative research for the identification and selection of information-rich cases related to the phenomenon of interest. Snowball sampling is a type of purposeful sampling where existing participants recruit future subjects from among their acquaintances. Thus, the sample group appears to grow like a rolling snowball.

Government and IGO (e.g. IOM) officials helped to identify migrant communities in the case study areas. From there on, use was made of the snowballing technique where participants were asked to identify other possible participants to the study. The criteria for recruitment was purposefully wide. Participants were considered eligible for participation if they were a resident of the case study area (18 years or older), albeit temporarily. For the South African case study, the CSIR project team administered surveys at the men's and women's refugee shelters in Musina and at a farm in the Weipe irrigation area in November 2017 and June 2018. For the Mozambican case study, the CSIR project team subcontracted researchers from Edoardo Mondlane University to administer the survey in the Chiaquelane and Chinhacanine resettlement camps in the Chokwe and Guija districts, respectively, in July 2019.

The survey instrument used in this study was based on the European Union-funded Migration, Environment and Climate Change: Evidence for Policy (MECLEP) project survey, conducted between January 2014 and March 2017 (IOM, 2014) (see Appendix 1 for the survey). This decision was taken to ensure comparability of data with an international study and with other country case studies.

The first section of the household survey collected information on the makeup of the household and focused on its socio-economic profile. The indicators of vulnerability included elements of food security, access to finance and levels of infrastructural development (e.g. housing materials). The second section collected the full migration history of all present and absent members who had contributed to or relied on the resources of each sampled household in the last 10 years. It provided researchers with quantitative data on migration patterns in the case study area, including the type, duration and date(s) of migration, which was a prerequisite to assess impacts. The migration history section also explored some socio-cultural aspects of migration decision making, such as place attachment, attitudes towards migration and the importance of social networks. The third section focused on the perceived overall financial, economic and social impact of migration at the household level. This section also looked at financial remittances and their use, as well as the type of skills migrants learnt at the destination and whether they used them and/or taught them to others upon return (Melde et al., 2017).

For the Limpopo case study, 113 surveys were conducted, with 52 being conducted at the men's and women's refugee shelters in Nancefield, Musina, in November 2017, and 61 being conducted at a farm in the Weipe irrigation area along the Limpopo River in June 2018. For the Gaza Province case study, researchers from Edoardo Mondlane University conducted 106 surveys, with 60 being conducted in Chokwe town and the Chiaquleane resettlement camp in the Chokwe district, and 46 being conducted in the Chinhacanine resettlement camp in the Guija District in July 2019. The research team had originally aimed to administer 100 surveys per case study area, and therefore exceeded the target for each case study area.

Table 2-1: Summary of surveys conducted in the two case study areas

Surveys administered in the two case study areas	
Case study area	**Number of surveys**
South Africa – Musina	52
South Africa – Weipe irrigation area	61
Mozambique – Chokwe town and Chiaquelane resettlement camp	60
Mozambique – Chinhacanine resettlement camp	46

The survey data was captured on a Microsoft Excel spreadsheet, which was then imported into the Statistical Package for the Social Sciences (SPSS) Version 23 to analyse data and perform relevant statistical tests. Once the data had been transferred to SPSS, a descriptive statistics analysis was run on the responses of the surveys, which resulted in tabulated descriptions (percentage and frequency tables) and graphic descriptions (bar charts and pie charts) of the survey data (Laerd Statistics, 2013).

The results of the survey data were incorporated into the case study analysis and discussion section, as applicable to the three sections that were discussed for each of the case study areas, and also informed the policy guidelines that were developed.

b. Semi-structured interviews

For the project, semi-structured interviews were conducted with migrants from each case study area, as well as with IGOs, government representatives at the national, provincial and local levels, NGOs and academia in both countries. The interviews were conducted with respondents working in the areas of climate change, migration, environmental policy, disaster management, spatial planning, health and/or migrant/refugee communities. The CSIR project team conducted the interviews with the interview respondents in South Africa and respondents from government, IGOs and academia in Mozambique, while the research team from the Edoardo Mondlane University conducted the interviews with migrants from Mozambique. The interviews took place throughout the duration of the project, between July 2017 and July 2019.

The interviews that were conducted with the migrants in both case study areas aimed to provide more in-depth information pertaining to specific issues that arose from the survey results, and that needed further elaboration by participants. Engagements with government at various levels aimed to establish the impacts of cross-border migration and internal displacement on the country of destination's environmental, economic and social resources, and the capacity of these governments (South Africa and Mozambique) to address the challenges pertaining to cross-border migration into South Africa, and internal displacement as a result of flooding in Mozambique. A further aim of engagements with local government officials was to assess the resilience and absorptive capacity of local government and communities to accommodate either an influx of environmental migrants or an outflow of inhabitants and resources as a result of environmental disasters. This fieldwork was conducted with a view to informing the policy guidelines aimed at informing government on how to address the impacts of cross-border migration and internal displacement. For more information on the questions asked, please refer to the interview questions in Appendix 2.

For the Limpopo case study, nine interviews were conducted with government representatives at national, provincial and local level, four interviews were conducted with academia and NGOs, 21 interviews were conducted with migrants at the farm and five interviews were conducted with migrants at the shelter. For the Gaza Province case study, four interviews were conducted with national and local government, six interviews were conducted with IGOs and academia, 16 interviews were conducted with migrants from the Chinhacanine resettlement camp and nine interviews were conducted with migrants from Chokwe town and the Chiaquelane resettlement camp. In total, and across both case studies, the research team had planned to conduct 10 interviews with government, 10 interviews with IGOs, NGOs and academia, and 30 interviews with migrants. The targets for the first two categories of interviews were therefore exceeded, but the team fell slightly short of its target for interviews with migrants.

Table 2-2: Summary of interviews per case study area

Summary of interviews conducted per case study area		
Interview respondent category	**Number of interviews in Limpopo case study**	**Number of interviews in Gaza Province case study**
Government	9	4
IGOs, **NGOs** and **academia**	4	6
Migrants	26	27

All interviews (individual interviews and focus group discussions) were voice recorded and transcribed by the interviewers. The transcripts were sanitised by removing all identity markers linking the text to specific participants. Based on the interviews conducted, three stakeholder groups were formed into which transcripts were grouped: migrants, government, and IGOs, NGOs and academia. All transcripts categorised under these stakeholder groups were merged into a single document per group in Microsoft Word format. A macro was then created and enabled to allow for inductive and emergent thematic coding (ETC) (also referred to as open coding by grounded theorists, or latent coding (Shapiro and Markoff, 1997)) using comment boxes (see example in Figure 2-2). ETC is a qualitative data analysis approach in which the text (in this case interview transcripts) is read several times to identify themes that emerge from the data (Amundsen and Sohbat, 2008).

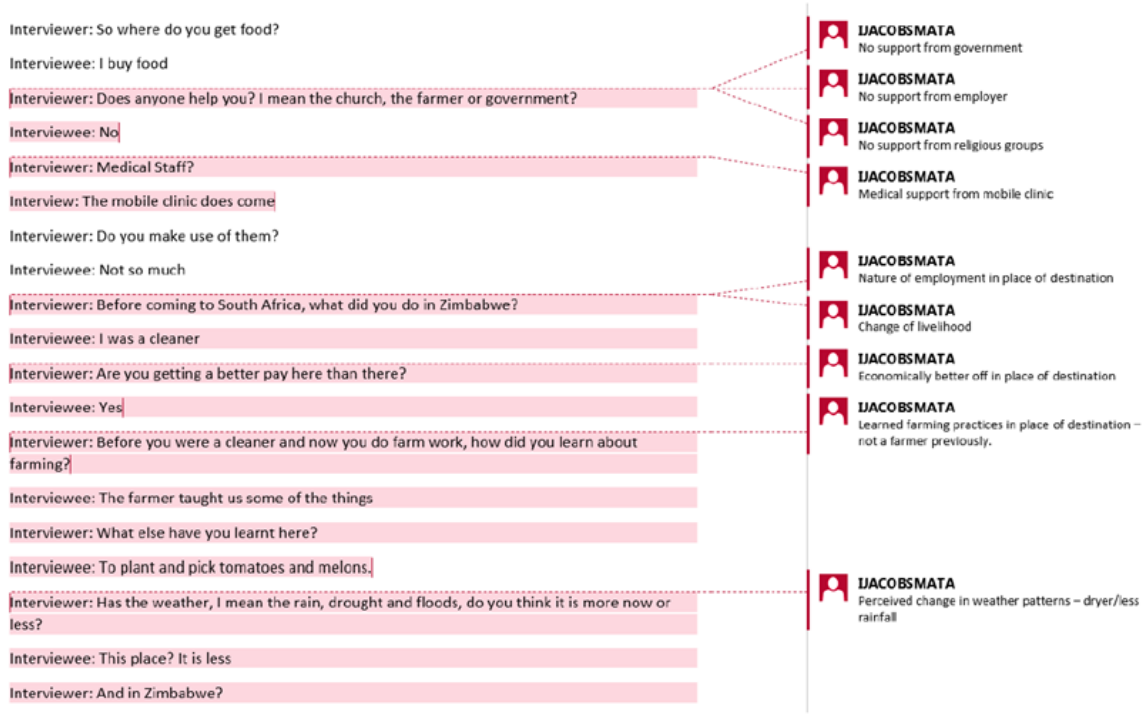

Figure 2-2: Example of how the interview text was coded

An independent coder then coded all transcripts into themes, coding anything that might be relevant from as many different perspectives as possible. Codes could refer to substantive things (e.g. particular behaviours, incidents or structures), values (e.g. those that inform or underpin certain statements, such as a belief in the link between drought and punishment by the ancestors), emotions (e.g. sorrow, frustration, hopelessness) and more impressionistic or methodological elements (e.g. the interviewee found something difficult to explain, the interviewee became emotional, the interviewer felt uncomfortable) (Gale et al., 2013; Saldaña, 2009). Themes were identified through inductive reasoning using two major methods of theme identification: repetition (phrases or opinions that were consistently mentioned) and indigenous categorisation (identifying phrases or words specific to the situation or subculture) (Pattinson, 2017; Ryan and Bernard, 2003).

The semi-structured interviews helped to better understand community-wide circumstances such as legal and policy frameworks that enabled or hindered migration (especially border policies, labour migration policies, disaster management strategies and spatial planning programmes), other intervening socio-cultural and environmental obstacles, and the influence of social networks.

The results of the interview data analysis were incorporated into the case study analysis and discussion section as applicable to the three sections that were discussed for each of the case study areas.

c. Focus group discussions

Two focus group discussions took place in the Limpopo case study to further discuss some of the themes that had emerged from the interview and survey analyses. The first focus group discussion took place at the men's refugee shelter in Nancefield, Musina, in February 2019, with participants from Burundi, the Democratic Republic of Congo (DRC) and Zimbabwe. Participants were asked to reflect on some of the major problems in their country of origin, and why they had left to come to South Africa. The discussion was subsequently directed towards how the participants felt about life in South Africa and how they had adapted.

The second focus group discussion took place at the women's refugee shelter in Nancefield, Musina, with participants from Zimbabwe in June 2019. The participants were asked to reflect on some of the major political and environmental events that had taken place in Zimbabwe from 2000 to 2019. The participants were also asked to reflect on environmental changes over the years, as well as changes to the political situation and living conditions in Zimbabwe. Subsequently, they were asked to reflect on the difference between migrants and refugees, and to speak about any skills they have that they could employ to make a living in South Africa.

No focus group discussions took place in Mozambique, but, while visiting the Chokwe and Guija districts to film a documentary on environmental migration in August 2019 (one of the project deliverables), the CSIR project team asked people about issues related to their adaptive capacity in the resettlement camps.

The focus group discussions were voice recorded and transcribed. They were subsequently coded for themes, and the emergent analysis was used in the case study analysis and discussion section, where applicable.

CHAPTER 3: CASE STUDY CONTEXT: EVIDENCE OF CLIMATE-INDUCED MIGRATION

3.1 CLIMATE CHANGE AND VARIABILITY IN THE LIMPOPO RIVER BASIN

The Limpopo River Basin straddles four countries: Botswana, Mozambique, South Africa and Zimbabwe, and covers an area of 408,000 km^2 (see Figure 3-1). It is also one of the most populated river basins in Africa, with 18 million people calling it home. The economic drivers are agriculture, mining, industrial development and large urban centres. Water usage in the Limpopo River Basin system is currently dominated by irrigation – the agricultural sector accounts for half of the total water usage, urban usage accounts for 30% and the remaining demand is divided evenly across the rural, mining and power sectors (LBPTC, 2010). Water usage for commercial irrigation is mainly focused in Zimbabwe and South Africa. Water is already over-allocated to irrigation in the South African part of the basin, creating problems for downstream users such as Mozambique. In fact, the Limpopo River Basin is regarded as a "closed" basin in that all of its allocable water has already been allocated to existing uses (Midgley et al., 2013). South Africa's water usage alone exceeds the basin's yield by 800 mm per annum (Midgley et al., 2013).

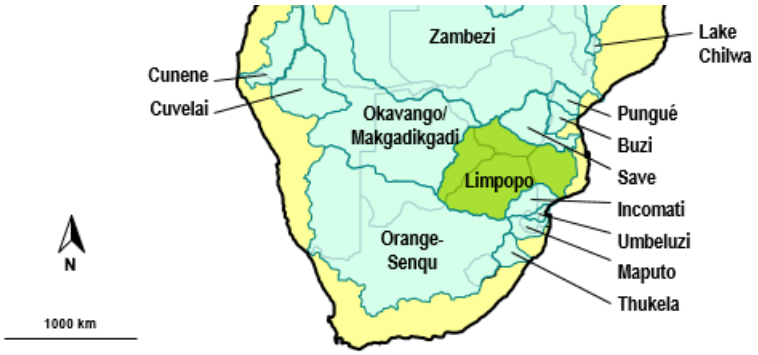

Figure 3-1: The Limpopo River Basin in southern Africa straddling four riparian countries

Water from the Limpopo River is also essential for sustaining the livelihoods of subsistence farmers in sparsely populated rural areas across all four countries, who rely on small-scale irrigation schemes and boreholes for domestic use. In Mozambique, the downstream riparian country, subsistence farming by rural families constitutes the majority of water usage from the basin, with the exception of some large-scale irrigation schemes in Chokwe (Midgley et al., 2013).

In South Africa, Botswana and Zimbabwe (the upstream riparian countries), the river supplies the major urban centres of Gaborone, Francistown, Johannesburg, Pretoria and Bulawayo. South Africa, Botswana and Zimbabwe also have major mining projects and power stations that utilise the river's resources (Midgley et al., 2013). Given its highly varied rainfall patterns, ranging from 1,200 mm per annum in the southeast to 200 mm in the central west, this basin is characterised by both drought and floods, and had registered a number of severe floods in the last 50 years, especially in 1955, 1967, 1972, 1975, 1977, 1981 and 2000 (Mondlane, 2010).

It is furthermore expected that increased volatility in rainfall will occur in future owing to climate change, thereby escalating the threat of drought and flooding. This leaves the rural subsistence farmers, a population already suffering from insufficient water resources (only two out of every five seasons produce sufficient crop yields) especially vulnerable (Earle et al., 2006).

3.2 HUMAN MOBILITY IN THE LIMPOPO RIVER BASIN

There are two main types of environmental migration in the Limpopo River Basin. The first is migration linked to rapid-onset events – arguably the easiest to classify due to the visibility and extreme nature of the natural event. This type of event is characterised by widespread environmental and socio-economic damage that often leaves hundreds of thousands of people displaced. After the occurrence of a rapid-onset event, some victims are able to return to their homes, depending on the extent to which the recovery of the "social, economic and physical" characteristics of the affected area is "rapid and effective, or rather slow and ineffective" (Warner, 2010). The second type of environmental migration that occurs in this basin is as a result of slow-onset events such as drought. Because of its "creeping" nature, the effects of drought occur slowly over an extended period. As a result, the onset and the end of drought are difficult to determine, making it even more challenging for scientists and policy makers to agree "on the basis of declaring an end to drought" (Wilhite et al., 2014). Similarly, as a result of its protracted nature, it is often difficult to determine related migration or mobility patterns, as there is no sudden displacement of a critical mass of people. It is also one of the most difficult to predict because of the types of migration (seasonal, return, repeat, permanent and temporary), the multi-causality of intervening variables (socio-economic status and migrant selectivity) and the complexity of environmental outcomes (deforestation and fisheries depletion) (Curran, 2002). When it can be observed, slow-onset migration is often caused by the depletion of resources (land and water), deforestation, desertification and pollution.

Additionally, for slow-onset events, the intervening factors that prevent or enable people to return (or avoid migration and displacement in the first place) become more complex than with rapid-onset events. The urgency for flight is temporally less pressing, because the rate of environmental change is slower. People may not have a choice to return to their former place of residence due to the physical loss of their land, e.g. due to coastal erosion or a sea level rise. However, in cases where the physical land is still available, people may have the opportunity to return to their original place of living, particularly if they can implement alternative livelihoods. Accelerated or slower environmental change affects the livelihoods of people to the degree that some or all household members migrate.

A further complicating factor regarding slow-onset events is the extent to which the event in question contributed to a person's decision to migrate. In a country such as Zimbabwe, for instance, political and economic factors often constitute the main reasons for people to migrate to other countries, with drought only constituting one of several additional contributing factors.

3.2.1 Flood-related migration

Most flood-related migration in the Limpopo River Basin takes place in downstream Mozambique, and is largely internal displacement. Heavy rains have caused major floods along the Zambezi River and periodic flooding along the Limpopo River. The 2001 floods displaced over 100 000, people, of which half were evacuated to temporary accommodation centres (Warner, 2010). Given the frequent disastrous floods, many people lost their homes and livelihoods, including their harvests and access to medical services, fresh drinking water and sanitation. In terms of response strategies, the Mozambican government's approach to environmental migrants is predominantly situated within its disaster management approach, particularly given the regular occurrence of disasters in the country, which frequently results in considerable internal displacement. Given the frequency of natural disasters however, Mozambique has instituted several planned relocation programmes (Warner, 2010).

Following the 2001 floods, international humanitarian aid was unprecedented. Years later, the government provided people with incentives such as infrastructure to assist them in relocating further from the flood plains. This was achieved through a work-for-assistance programme in which the government committed to pay for the construction material and technical assistance needed to build houses and multi-purpose community buildings, in exchange for making bricks (Warner, 2010).

In the Gaza Province, the flood event of 2000 resulted in massive losses and damage, and areas affected (see Figure 3-2) were almost completely destroyed (Davies, 2013). The impact of the floods of 2013 exceeded the impact of the 2000 floods in the Gaza Province area, with 420,000 people being affected across Mozambique, and 150,000 being affected in the Gaza Province (Humanitarian Country Team for Mozambique, 2013). The floods caused significant damage to people's homes, to livelihoods like agriculture, cattle and trade, to basic social services such as schools, to healthcare centres and to community infrastructure like roads, bridges, electricity and drainage systems (Humanitarian Country Team for Mozambique, 2013).

Figure 3-2: Flood-affected areas in Mozambique as a result of the flood of January 2013 (Humanitarian Country Team for Mozambique, 2013)

After the big flood of the Limpopo River in 2000, the Mozambican government constructed the Chihaquelane resettlement camp in Chokwe District, followed by the Chinhacanine resettlement camp following the even bigger flood of 2013 (see Figure 3-3). Since the floods of 2000, many people living along the Limpopo River in the Chokwe and Guija districts have been forced into an increasingly nomadic lifestyle, commuting between their more fertile areas of origin in the Chokwe District, where they are able to practice subsistence agriculture, and the less fertile, but also less flood-prone areas to which they were resettled. Some people lost so much in the floods of 2013 that they choose poverty and hunger over returning to their flood-prone areas of origin, while others choose to take the risk of staying in low-lying, flood-prone areas as it is easier for them to make a living there (Warner, 2010).

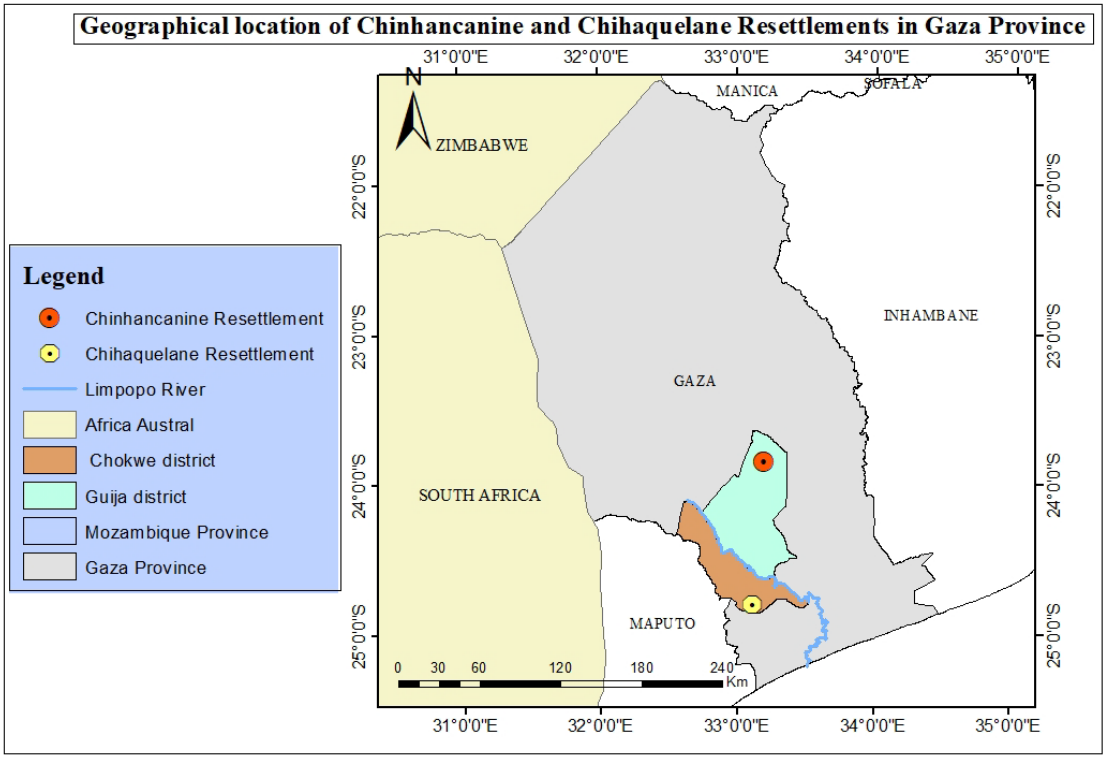

Figure 3-3: Geographic location of the Chinhacanine and Chiaquelane resettlement camps in Gaza Province

Earlier studies, which focused on the displacement of people living in relocation centres in Mozambique, revealed that, prior to the 2000 floods, the affected people had never been migrants. Instead, they were only temporarily evacuated from the flood plains and returned when it was safe to do so (Warner, 2010). Many indicated that they used to live in low-lying river areas that had frequently flooded during rainy seasons. Their decision to resettle elsewhere was voluntary (in order to move to a flood-safe area) or they had been moved by the government. However, given that flood-safe areas are also susceptible to drought, onward migration was not likely for those who were relocated, due to the lack of alternative livelihoods and the dependence on government-provided infrastructure and services (Warner, 2010). The relocation plan moved villages closer together to minimise the impact on social networks. NGOs offered training for farming techniques suited to the drought-prone conditions in resettlement areas. Yet many able-bodied people left the resettlement areas during the planting and harvesting season, and returned to the flood plains (Warner, 2010).

There have been several advantages and disadvantages of planned relocation in Mozambique. While it has led to substantial reductions in drowning cases, it has also led to major issues such as deforestation, soil erosion and water scarcity. Increased crop failure due to floods and drought has also exacerbated the vulnerability of people living in resettlement areas and flood areas.

Resettled people remain heavily dependent on governmental and international aid (Stal and Warner, 2009). Tilt et al. (2009) suggest that relocation programmes can better meet the needs of those displaced when authorities engage in a transparent process that ensures that basic human rights are upheld, and that they act early to ensure that resettled residents can participate in the relocation planning process.

3.2.2 Drought-related migration

The Limpopo River Basin also has a long history of cyclic droughts that have had crippling effects on its riparian states, and that have contributed to low life-expectancy levels and high levels of relocation. In 1992, southern Africa faced one of the most severe droughts in history, which resulted in the loss of livestock, with Zimbabwe at a 1.3 million loss (McGregor et al., 2011). The economic effects were also felt outside the agricultural sector. Largely as a result of the drought and subsequent water and electricity shortages, Zimbabwe experienced a 25% reduction in volume of manufacturing output (SADC-IUCN-ZRA-SARDC, 2000).

Another devastating drought affected southern Africa in the summer of 2015/16, due to the El Niño weather phenomenon. In February 2016, the UN food agency reported that the rainfall in large parts of Zimbabwe, Malawi, South Africa, Mozambique, Botswana and Madagascar had been the lowest in 35 years, and that this was having detrimental impacts on harvests and food security. Drought emergencies were declared in most provinces in South Africa, as well as in Zimbabwe and Lesotho, and water restrictions were put in place in Botswana, Swaziland, South Africa and Namibia. It was projected that the need for emergency food assistance and livelihood recovery support in the region would increase considerably (Phys.org, 2016).

In terms of the Limpopo River Basin, Mozambique and Zimbabwe were marked by food insecurity due to the 2015/16 drought, with 1.9 million people and 4.1 million people being impacted, respectively (see Figure 3-4 for a schematic representation of the impact of this drought on Zimbabwe). In addition to its food security challenges, Mozambique is characterised by high levels of poverty and limited resilience to climatic shocks. Mozambique also regularly suffers from cyclones, droughts, floods and epidemics that inflict damage on already inadequate infrastructure, and further impact on its agricultural sector. Food insecurity in Zimbabwe in 2016 was aggravated by the sharp economic downturn, which resulted in even higher levels of unemployment. Cereal production decreased and the condition of the country's livestock worsened during the 2015/16 season. The drought exacerbated the already extreme levels of poverty in Zimbabwe, where 72% of the population survives on less than US$1.25 per day. Vulnerable population groups, in particular households headed by children or the elderly and households affected by HIV, who have little or no livestock and only limited access to remittances, have been worst affected. In southern Africa as a whole, food insecurity furthermore weakened the ability of households to cope, damaged their resilience and negatively affected their ability to recover from future shocks. Continuing food insecurity in the region was expected until the harvest season in March 2017 (FSIN, 2017).

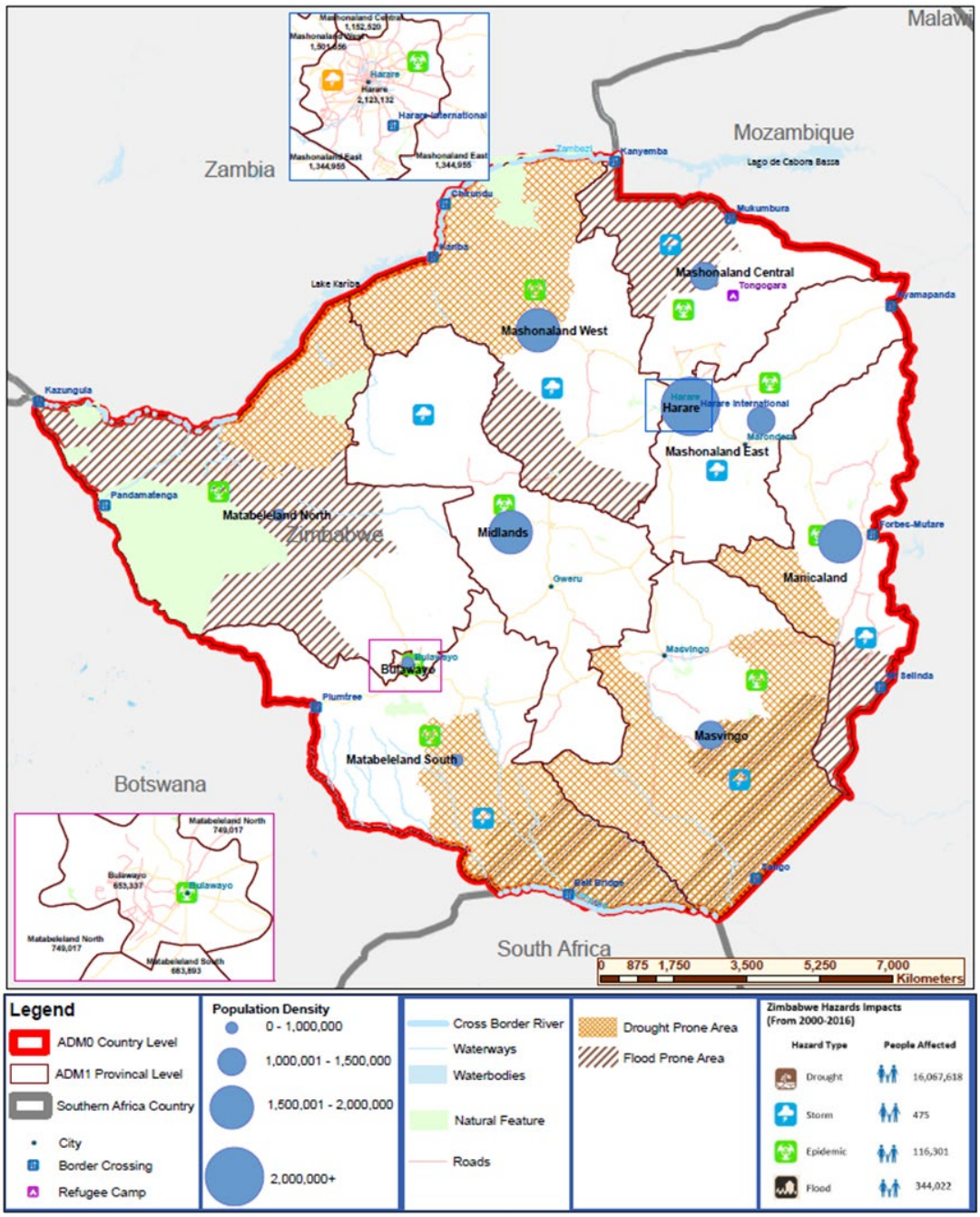

Figure 3-4: The impact of natural disasters in Zimbabwe, one of the main "sending countries" of the SADC region, 2000–2016 (Melde et al., 2017)

The link between drought and migration is not as evident as it is with rapid-onset events, and there is arguably less articulation of drought impacts in climate adaptation policy. That being said, however, since the creation of the Paris Agreement, countries have started to submit Intended Nationally Determined Contributions (INDCs) that outline their post-2020 climate actions, including adaptation measures, which they aim to take under the new international agreement (Kelpsaite and Mach, 2015). Both South Africa and Mozambique have submitted their INDCs to communicate internationally the local realities of climate change and their proposed measures to reduce climate risk.

Given the longstanding trend of labour migration from Zimbabwe to South Africa, it is difficult to isolate environmental migration, as Zimbabweans have increasingly migrated over time as opposed to waiting until a crisis point arrived.

Displacement across international borders poses an additional, distinct set of protection needs and challenges. As previously noted, there is no international legal assurance that, in the event of a rapid-onset disaster, or when a slow-onset disaster has forced people to move, a person will be able to seek international protection in another country (UNHCR, 2012). Although human rights law provides “an indirect right to be admitted and to stay where the removal of a person back to the country of origin would amount to inhumane treatment”, this does not address all displacement situations (The Nansen Initiative, 2015).

CHAPTER 4: CASE STUDY RESULTS AND DISCUSSION

This section presents the results and discussion of the analyses of the South African and Mozambican case studies, and does so in a systematic and structured manner.

4.1 CATEGORISATION OF (ENVIRONMENTAL) MIGRANTS AND INVESTIGATION OF REASONS FOR MIGRATION

4.1.1 Conceptual framework for categorising individuals who move due to environmental stressors

Firstly, the conceptual framework developed by Renaud et al. (2011) for categorising individuals who move due to environmental stressors (see Figure 4-1) is presented. This framework aims to distinguish between whether someone can or cannot be defined as an environmental migrant. If someone can be defined as an environmental migrant, the framework helps determine whether the person is an environmentally motivated or an environmentally forced migrant. Environmentally motivated migrants are people who “may leave” a steadily deteriorating environment in order to pre-empt the further deterioration of their livelihoods. Environmentally forced migrants are people who “have to leave” in order to avoid the worst of environmental deterioration, but not with the same urgency as environmental emergency migrants or displaced persons (Renaud et al., 2011).

Furthermore, the framework focuses on the interplay of economic, political, social and environmental stressors in shaping someone’s decision to leave their home. To help explain the complexity of this interplay of stressors, the framework relies on the concepts of socio-ecological systems and ecosystem services, which are also included in the discussion (Renaud et al., 2011). The conceptual framework of Renaud et al. (2011) provides a useful analytical lens to this study as it takes the concept of “environmental migrant” as a starting point and helps interrogate the reasons behind someone leaving their original place of living. The framework furthermore focuses on critical analytical elements such as rapid- vs slow-onset hazards, degrees of forced vs voluntary migration, and the dominance or not of environmental factors in influencing an individual’s decision to migrate.

After introducing the framework, it is applied to the case studies and, with the aid of the data analysis and case study findings, the research team reflects on which elements of the case studies the framework has been able to explain and which elements it has not been able to cover. On the basis of the discussion, some areas for future development and discussion are suggested.

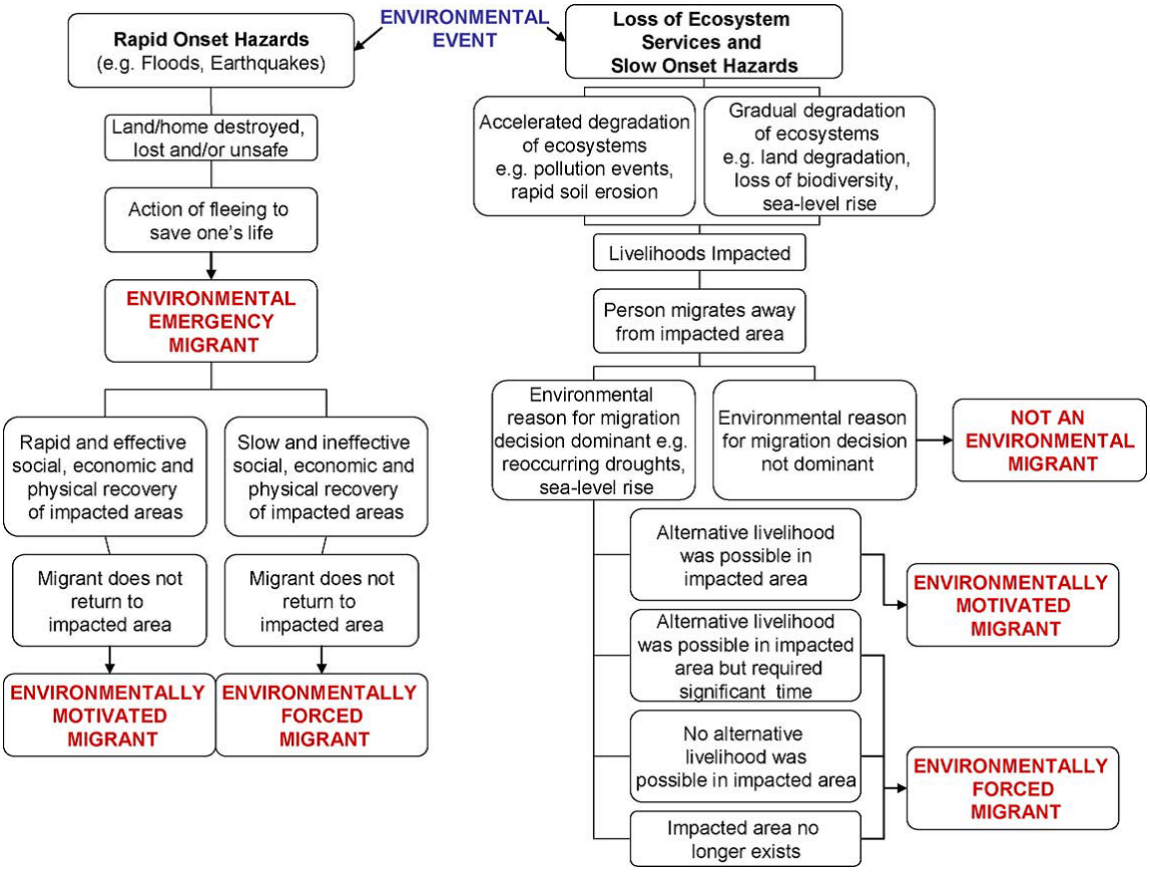

Figure 4-1: Conceptual framework to distinguish environmental migrants from other migrants, and to define different types of environmental migrants (Renaud et al., 2011)

Due to its focus on environmental migration, the starting point of the framework is an environmental event. The framework distinguishes between a rapid-onset hazard such as a flood or an earthquake (see left hand side of Figure 4-1) and the gradual loss of ecosystem services and "creeping" slow-onset hazards such as drought or land degradation (see right hand side of Figure 4-1). Rapid and slow-onset hazards should be distinguished from each other as people affected by these different types of hazards will require differing support, coping and adaptation strategies. For example, someone affected by a severe flood will require shelter and assistance away from their home as they may not be able to return for a while. In contrast, those who feel they need to leave their homes in search of better livelihood opportunities due to a slow-onset hazard such as a drought will require assistance in finding a new place to stay, and accessing crucial services (e.g. healthcare) and employment opportunities. Those who stay behind and have to face the impacts of the drought may need support in terms of techniques or training to adapt or change their main livelihoods (Renaud et al., 2011).

Focusing on the left-hand side of Figure 4-1, after a rapid onset hazard has taken place, a number of factors will determine how quickly a displaced person can return to their original place of living. These factors include casualties or trauma suffered by the person, institutional and financial support, the extent of the damage, the post-impact state of the environment, and social or demographic factors such as the composition of the remaining and returning populations. According to Renaud et al. (2011), individuals who do not return to their original way of living, even if there has been effective and swift social, economic, physical and ecosystem recovery after the emergency phase, are environmentally motivated migrants. These individuals would be considered environmentally motivated rather than environmentally forced migrants because, although environmental factors remain the cause of the original migration, recovery in the place of origin means that people are, in principle, able to return and rebuild their lives.

The act of migration and the decision not to return is therefore not linked to urgency anymore, which makes such an individual an environmentally motivated rather than an environmentally forced migrant. If, on the other hand, the social, economic and physical recovery in the impacted area is slow or ineffective, preventing individuals from returning, these individuals should be considered environmentally forced migrants.

The right-hand side of Figure 4-1 focuses on the progressive loss of ecosystem services, and slow-onset hazards. These include land and soil degradation, desertification, water resources degradation, pest infestations, droughts, a rise in sea level, etc. According to Renaud et al. (2011), if the dominant reason forcing individuals to move is environmental, such individuals should be defined as environmental migrants. In cases where the environmental reason cannot be significantly separated from other reasons (e.g. social, economic, cultural or political reasons), the migrant cannot be considered an environmental migrant (Renaud et al., 2011).

Once somebody in the category of loss of ecosystem services and slow-onset hazards has been classified as an environmental migrant, this individual can be further described as either an environmentally motivated migrant or an environmentally forced migrant. The first category of environmental migrants applies to individuals who decide to move or not to return to their original place of living despite alternative livelihoods being possible in the impacted areas, for example, through self-help or external interventions. Environmentally forced migrants are individuals who have moved from places where alternative livelihoods are not possible, will take a significant time to implement or where the impacted area has disappeared completely (e.g. through permanent inundation due to riverbank erosion or a rise in sea level) (Renaud et al., 2011).

Related to the classification of environmental migrants of Renaud et al. (2011) as environmentally motivated or environmentally forced migrants, it is also important to determine the combination of reasons why individuals decide to migrate and the influence of environmental factors on this combination of reasons. Determining the role that environmental reasons or stresses play in forcing an individual to move is complex because multiple factors, such as social, political and economic factors, are often at play when it comes to an individual's decision-making process regarding whether they should move or not. It can therefore be difficult to disentangle the influence of environmental factors from the other factors that influence their decision-making process. Here, it is also important to look at the coping capacities and adaptive capabilities of affected communities (Renaud et al., 2011).

In this regard, and in addition to the framework of Renaud et al. (2011), it is argued that, when considering the interplay of social, political, economic and environmental factors in influencing an individual's decision to migrate, environmental factors can often magnify or worsen the combination of other pressures an individual or household faces (see Figure 4-2). This is particularly the case if, in the context of social, economic and political pressures, an individual or household's access to an alternative livelihood is negatively impacted on due to environmental factors. So, for instance, if a country is characterised by high unemployment, political instability and extreme poverty, individuals or households will face a myriad of pressures and, in the absence of social and economic support and opportunities, will need to look to themselves to stay alive. Differently said, they will need to be resilient enough to carry on coping with the challenges of everyday life under extremely adverse circumstances. If, however, these individuals or households cannot make a living off the land (e.g. by means of subsistence farming) due to environmental factors (e.g. drought, land degradation, flood, etc.), their adaptive capacity, associated coping mechanisms and resilience have been severely impacted on by such environmental factors.

Figure 4-2: **Diagram indicating the interdependency of political, social and economic stressors of factors, which is often overlain by the influence of environmental factors. The grey arrows originating from the environmental factors circle indicate that such factors can strongly influence or aggravate political, social and economic stressors. In combination, these factors or stressors can result in the decision of an individual or household to migrate.**

Renaud et al. (2011) argue that environmental degradation processes are often a consequence of the degradation of social, economic and political conditions and vice versa. In order to unpack this complex relationship and determine the extent to which environmental factors impact on people's decision to migrate, it is useful to reflect on the concepts of socio-ecological systems and ecosystem services. The concept of a socio-ecological system is linked to that of sustainable development, with its focus on attaining the developmental needs of societies without sacrificing the state of the environment (Turner et al., 2003; Colding and Barthel, 2019). More specifically, a socio-ecological system is a complex system that is characterised by the interaction and mutual dependence of societal (human) and ecological (biophysical) subsystems (Gallopin, 2006; Colding and Barthel, 2019).

An important issue that is linked to socio-ecological systems is to investigate the cause of environmental degradation. While certain instances of environmental degradation can be argued to be natural and not initiated by human activity (e.g. volcanic eruptions or earthquakes), others can be linked to human activity either directly (e.g. land degradation) or indirectly (e.g. climate change). The connection between human actions and environmental degradation further complicates the process of analysing the contribution of environmental factors to an individual's decision to leave their original place of living (Renaud et al., 2011).

In addition to the concept of socio-ecological systems, it is also important to consider the concept of ecosystem services. Ecosystem services can be defined as the benefits that people obtain from ecosystems, such as provisioning services (e.g. land, food, fibre, fresh water) and regulating services (e.g. climate and air quality), and which contribute to human wellbeing and poverty reduction.

More and more, the world's ecosystem services are experiencing severe pressure, which is increasingly resulting in the loss of provisioning and regulating services. The threatening of these services also contributes to environmental and economic migration (Renaud et al., 2011).

At this point, we move on to discussing the actual process of migration. Some authors consider migration to be an adaptation process, for example by sending some family member abroad to support the household by means of remittances, thereby increasing the household's resilience, while others see it as the end result of failed attempts at adaptation (Renaud et al., 2011).

4.1.2 Application of the conceptual framework: Limpopo case study

In this section, we apply the conceptual framework of Renaud et al (2011) on how to determine whether individuals are environmental migrants and what kinds of environmental migrants they are, together with an additional focus on examining the combination of factors that may cause an individual to migrate, to the Limpopo case study. Here, use is made of the data from the surveys, interviews and focus group discussions and, where applicable, this data is supplemented with other literature.

a. Country of origin and types of migration

Of the 111 respondents in the Limpopo case study who replied to the survey question: Place of birth, 109 were born outside South Africa. Regarding specific locations of origin, 65% of respondents came from Zimbabwe, 25% came from the DRC, 9% came from Burundi, and 1% came from South Africa (see Figure 4-3).

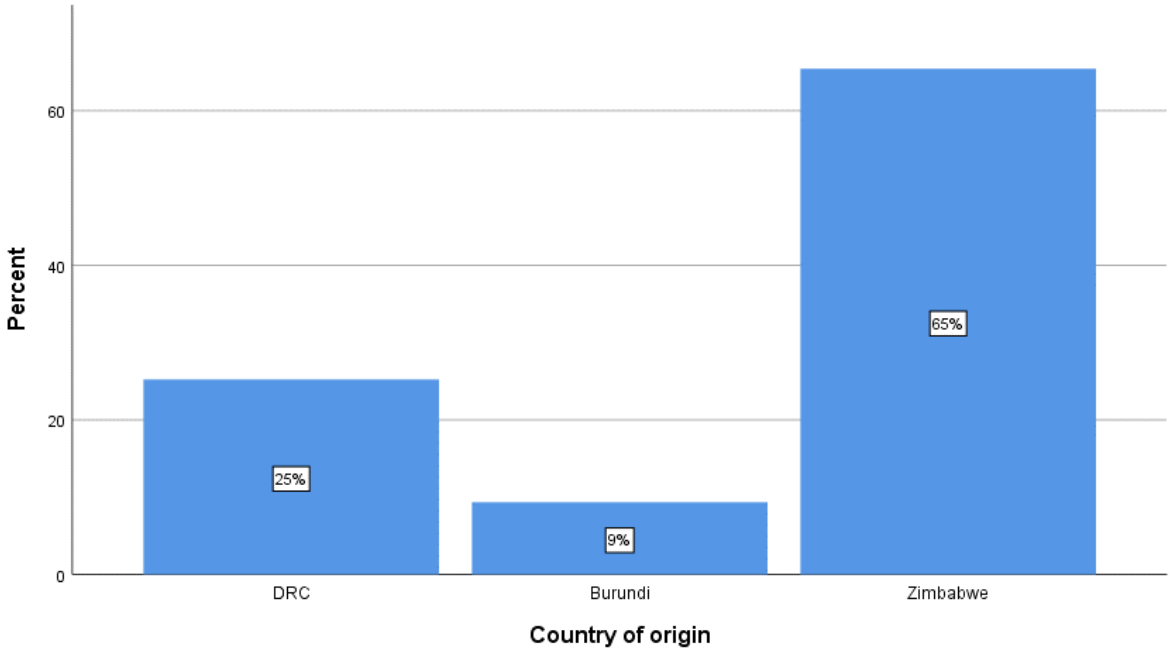

Figure 4-3: Percentage of survey respondents per country of origin

Looking at the type of movement into South Africa, 50% of respondents indicated that their movement was long term (over a year), 29% indicated that their movement was short term (three months to one year), 20% indicated recurrent or seasonal movement (three months to one year) and 1% indicated relocation or assisted return to their countries of origin by authorities (see Figure 4-4). These results indicate that half of the respondents intend to stay in South Africa in the longer term in an effort to make a life for themselves there.

Some of the survey respondents who have been in South Africa for between three months and a year are based at the refugee shelters in Musina, which are places of transit as migrants decide what their next steps will be. The recurrent or seasonal movement can be explained by the farmworker survey respondents, who come back to the Weipe farm at which they work during the harvesting season every year.

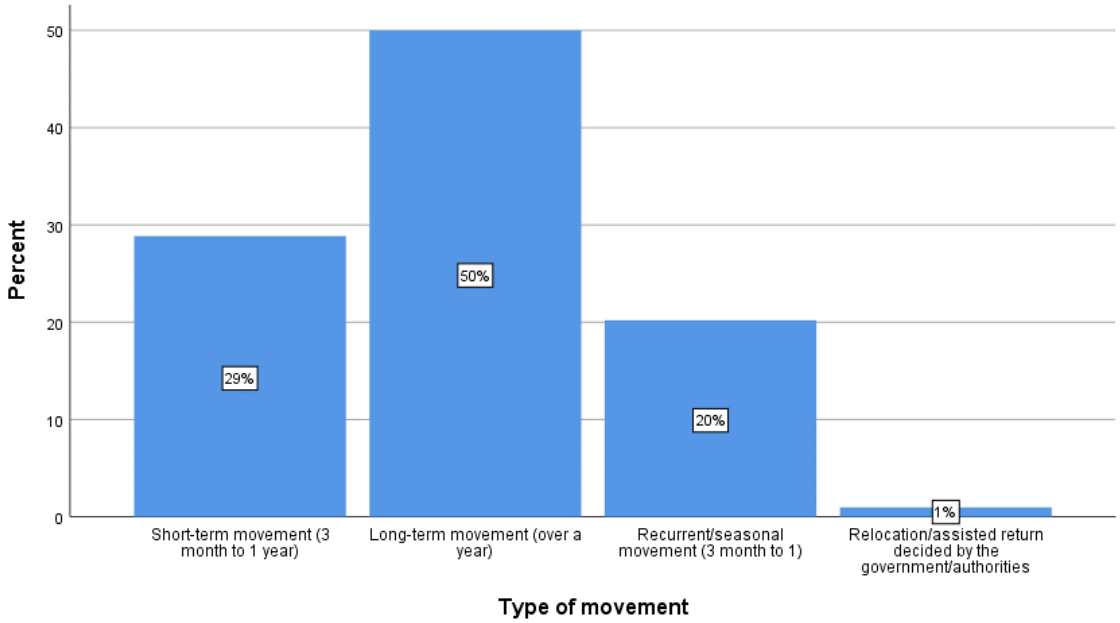

Figure 4-4: Percentage of survey respondents per type of movement indicated

Having established the origin and type of migration of the survey respondents, it is important to look at reasons why the respondents came to South Africa, and the extent to which environmental stressors or factors impacted on their decision to move. To this end, use was made of the survey and interview analysis, as well as the results of the focus group discussions at both Musina shelters.

b. Conditions in the place of origin

Most of the interview respondents from Zimbabwe had been unemployed there, and some therefore practiced small-scale farming of, for example, maize, melons and sorghum. At times, the produce would be sold to generate a small income. From the interviews with the Zimbabwean migrants, it could also be deduced that small-scale farmers either pay a considerable monetary contribution to belong to an irrigation scheme, or practice rain-fed agriculture in generally dry conditions: *"We wait for the rain"*. Knowledge about farming is often passed on from generation to generation.

Also, according to the interviews with migrants from Zimbabwe, other employment (generally not secure or well paid) included working in a tavern, mixing concrete for builders, selling clothes, working as a security guard and working for government on a short-term contract. The respondents were quite clear that being educated in Zimbabwe does not translate into finding a good job, as illustrated by this quote:

> *I came to South Africa because there are no jobs in Zimbabwe. There are many of us in our country and both educated and uneducated people struggle to find a job.*

The interview respondents were also vocal about the difficult political conditions in Zimbabwe, which translated into economic hardships:

> *When we do receive rainfall, harvest is plenty, but how can we sell our harvest when people have no money … Politics is a huge problem.*

They also reflected on the lack of change, which many were hoping for, after the elections. One of the challenges in Zimbabwe is the lack of available cash to conduct financial transactions, as illustrated by the quote below:

> *I really didn't enjoy anything about the job in Bulawayo, I was just doing it because I had to feed my family. We never got any physical cash; money was loaded into an account and we could only swipe without being able to withdraw any of it. It was very tough, as I had to go around shops asking people who were buying with cash if I could swipe their grocery for them and they pay me in cash. I felt like a nuisance, but I had to at least try.*

The above examples indicated a complex interplay of factors that impacted on Zimbabweans' ability to make a living, including environmental factors, particularly drought or irregular, unpredictable rainfall, which makes it difficult to farm. These observations fit the conceptual framework of Renaud et al. (2011), and its emphasis on a combination of factors that make it difficult, if not impossible, to make a living, and may eventually force individuals to leave their place of origin.

c. Reasons for migration

At the onset of this section, it is important to state that some of the survey respondents said outright that they see themselves as refugees and not as environmental or other types of migrants. For the survey, these respondents answered that there had not been a single climatic or weather-related event that affected them more than others, but that instead, they were impacted on by political factors (1.8%) and war (10.6%). When the surveys were administered, these survey respondents stated quite categorically that it was not environmental factors that caused them to leave their homes, but that they did so for fear of their lives due to political tension and violence in the DRC and Burundi (e.g. The Conversation, 2017; Steers, 2019). During a focus group discussion at the men's shelter in Musina, respondents mentioned the problem of tribalism in the DRC, and that of current leaders not wanting to step down, which then affects the country as a whole. At the same discussion, respondents from Burundi spoke about a gang of youngsters aligned to the ruling government that forced young people to join them and killed those who refused. This is the reason why Burundians decide to migrate to South Africa. Those respondents who fled their country as a result of persecution "for reasons of race, religion, nationality, membership of a particular social group or political opinion" can therefore be termed refugees, as per the definition of the 1951 Refugee Convention (UNHCR, 2019). Their main reason for migration is political and/or war-related and not environmental, and they can therefore not be classified as environmental migrants.

We now move on to other possible reasons why respondents from Zimbabwe in the Limpopo case study area migrated to South Africa. According to an interview with one of the interview respondents from academia, the reasons why people move when faced by slow-onset environmental pressures are complex. It is therefore very difficult to show causality as, in such cases, an individual's decision to leave their original place of living can probably be attributed to more than one reason. This relates to the addition to the conceptual framework of Renaud et al. (2011), which emphasises the need to examine the combination of factors that influence an individual's decision to leave their original place of living. An interesting quote from the interviews with migrants illustrates this interplay of (environmental) push and (economic) pull factors:

> *We depend on agriculture, yet we don't receive rainfall. These are the pushing factors, but there also has to be something pulling you. You know about the economic crisis in Zimbabwe; money can pull you to come to South Africa because you can't stay with your family and do nothing, we would starve. I used to work in government and now the country is just not the same.*

According to the interviews with local government in the Limpopo case study area, the search for employment seems to be a main driver for migration into South Africa from countries such as Zimbabwe and Mozambique.

This interpretation was echoed in statements from the interviews and a focus group discussion with the migrants. The main drivers for migration that were mentioned in these interviews and in the focus group discussion are a search for employment in South Africa, the political situation in Zimbabwe, hunger, good and free healthcare in South Africa and the need to support children and family.

Here are some quotes that illustrate the migrant interview respondents' stories:

> *One of my brothers was working on this farm, he told me about it, so I came here with one mission: to get a job.*
>
> *Yes, I had to find other means to feed my family, we were living off unground mielie meal. It was very tough. I came to South Africa to look for money, I could no longer live in Zimbabwe and watch my mother and my siblings struggle. And now, my family is enjoying rice, bread and nice food because of my migrating.*
>
> *The political instability back home also contributed to me migrating to South Africa and I think many people move for this reason too.*
>
> *My uncle has had to sell his house just to cover his hospital bill. There's no public or private healthcare in Zimbabwe, you pay for everything. You pay for each pill, each stitch, etc. Here in South Africa, everything is free and it's good healthcare.*

This can be explained by a number of factors that make it difficult to eke out a living in Zimbabwe. These factors include, but are not limited to the unemployment rate in Zimbabwe, which is estimated to be very high, but is also very difficult to quantify (Africa Check, 2014), the inflation rate which the International Monetary Fund (IMF) pegs at 300% (Muronzi, 2019) and a complete lack of social support from government to sustain impoverished households, thereby severely impacting on the resilience of such households. South Africa, by contrast, has a social grants system to support the country's poorest households (Joubert, 2019).

From an environmental perspective, the interviews with local government in the Limpopo case study area showed that farmers in Zimbabwe are not able to farm as they used to due to severely reduced rainfall and repeat occurrences of drought, and may therefore move to South Africa due to better farming conditions there. This sentiment was echoed in the focus group discussions with female migrants from Zimbabwe, where a respondent said, "*My grandmother told me there was too much rain back then, they were able to plant and harvest."*

The findings from the interviews with local government also indicate that the recent drought conditions in Zimbabwe contributed to considerable food shortages in that country (e.g. of maize), which could contribute to people's decision to relocate. The struggles of Zimbabweans with drought and its impact on their decision to come to South Africa are reflected in the quotes below:

> *There was a drought, we had no rainfall for a very long time and could not grow crops, and we could not feed our families. Regardless of the drought, I would have moved to South Africa because there are no jobs back in Zimbabwe and I wanted my kids to go to school.*
>
> *For me, it's mainly economic reasons; employment. However, I can also say the drought in Zimbabwe caused so much poverty and hunger, we end up stealing from one another as a coping mechanism.*

Linked to the prevalence of drought and reduced rainfall is the perception of many people that extreme weather events are a punishment from God for Zimbabwe's civil conflicts that took place between 1964 and 1979, and again in the early 1980s:

We all have different belief systems; others would say it was sabotage from the war. There were certain places that we respected (sacred places). During the rainfall season or when things weren't going well, our people would gather and pray to the ancestors. But during the war, the sacred spaces were destroyed; trees were cut. So, people linked what's currently happening to Zimbabwe to the war destroying our sacred land.

These interview findings support other research data that indicates that drought is a recurrent problem in the southern African region. Drought is perceived as a persistent and creeping challenge across the SADC region (Vogel and Van Zyl, 2016) with 60% of the region being vulnerable to its effects (The Nansen Initiative, 2015). Recent drought episodes in southern Africa, including the severe drought of 2015/16, have seen the displacement and migration of people across the region, although little is known about the extent of these human movements (World Bank, 2018).

The findings discussed above are mirrored in the survey results, Regarding climatic or weather-related events or environmental stressors impacting on the respondents' households that may have contributed to the respondents' decision to migrate, 58.6% of survey respondents indicated that they had been affected by drought several times over the past ten years, and 9.9% of respondents indicated that they had been affected by drought once over the past ten years.

Some 81% of the survey respondents indicated that one climatic or weather-related event affected them more than the others (see Figure 4-5), and of these respondents, 79% stated that the climate or weather-related event that affected them the most was drought or irregular rains (see Figure 4-6). This finding again demonstrates the prominent effect of drought on people's livelihoods in the southern African region.

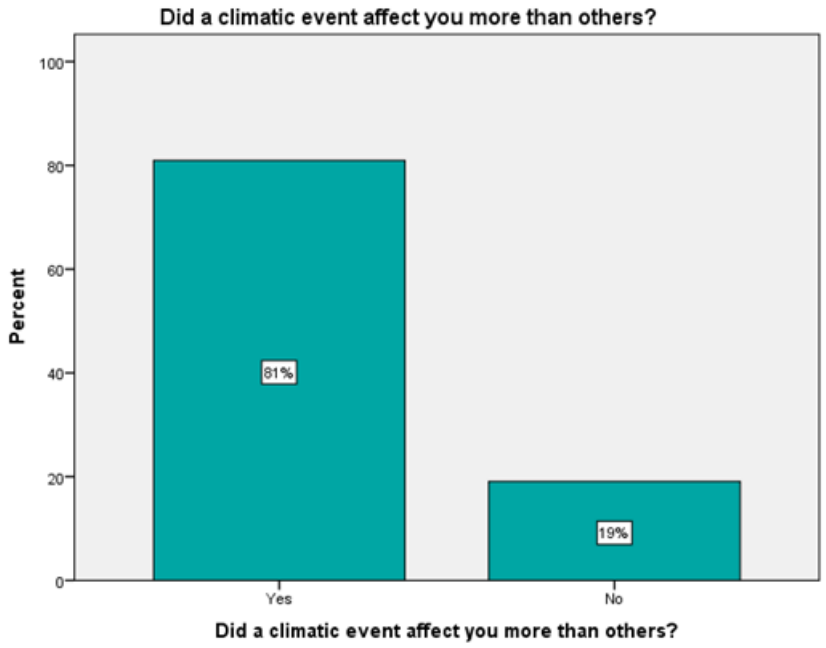

Figure 4-5: Percentage of survey respondents indicating that one climatic or weather-related event affected them more than others

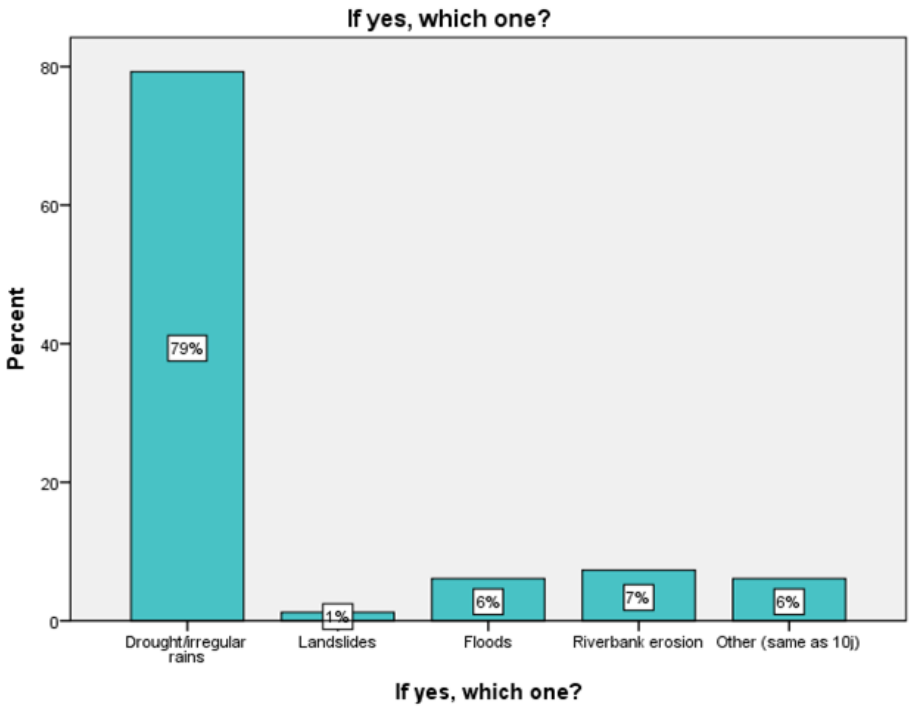

Figure 4-6: Percentage of survey respondents indicating which climatic or weather-related event affected them the most

Other notable climatic or weather-related events that affected the survey respondents over the past 10 years included riverbank erosion (with 29.1% being affected several times and 19.1% being affected once), floods (with 24.3% being affected several times and 19.8% being affected once), storm surges (with 21.8% being affected once and 8.2% being affected several times), earthquakes (with 19.3% being affected once), cyclones or hurricanes (with 17.4% being affected once and 11.0% being affected several times), wildfires (with 14.8% being affected once and 13.0% being affected several times) and landslides (with 13.8% being affected once).

Relatedly, and based on the interviews with academia, one of the factors determining whether or not an individual will leave their original place of living is the vulnerability of a household, and how dependent the household is on the environment (for example, for subsistence farming activities). The ability or inability of a household to adapt to or withstand unfavourable climatic conditions will also influence whether the movement of individual(s) from that household is forced or voluntary, or temporary or permanent. These observations link back to the importance of understanding the coping capacities, adaptive capabilities and resilience of affected communities both at their original places of living and in the areas to which they have moved (Renaud et al., 2011).

Adaptive capacity can take on several forms. According to the interviews with academia, one of these forms is the capacity of an individual to adapt to challenging environmental circumstances, which can enable that person to stay in their place of origin rather than to move. Another is the capacity of an individual to adapt once they have moved into South Africa from a neighbouring country. An example of an individual or household's adaptive capacity to stay in their place of living is their means to take out insurance against extreme weather events. From the interviews with the Zimbabwean respondents, drought conditions severely impacted on the adaptive capacity of their households as they were unable to become self-sufficient, for example by practicing subsistence agriculture, in the absence of other economic opportunities and support from the government. The presence or absence of adaptive capacity, in turn, impacts on whether or not a household can be resilient in the face of external challenges.

Also, according to the interviews with academia, migration often takes place when an individual or household feels that no other option remains. In line with this interpretation, several of the interview respondents indicated that they were left with no other choice but to migrate to South Africa, as this quote illustrates*: "You don't decide, you're forced to. I was forced by the situation."*

When linking this section to the arguments of Renaud et al. (2011) to determine whether an individual is an environmental migrant and, if so, whether they are an environmentally motivated or an environmentally forced migrant, the research team concluded the following:

The factors for migration for many of the respondents in the Limpopo case study, particularly the respondents from Zimbabwe, have been difficult to disentangle. Most of the respondents from Zimbabwe cited the search for better employment opportunities as the main reason for their migration, but this economic reason went hand in hand with a number of other reasons, including political instability, lack of social support from government, an expensive healthcare system and drought conditions. According to the framework of Renaud et al. (2011), most of the Zimbabwean respondents should therefore not be classified as environmental migrants. However, it can be argued that some of the Zimbabwean respondents could be classified as environmental migrants due to their emphasis on the severity of the drought conditions affecting them and strongly influencing their decision to come to South Africa, i.e. becoming the dominant reason for their decision to move. Here, one should also reflect on the reasons why respondents give certain answers to certain questions. Given that many migrants coming to South Africa follow the asylum-seeker process, they may have wanted to emphasise the political and economic hardships they were facing in their country of origin, even when speaking to researchers. Highlighting the environmental reasons for their decision to come to South Africa would be of little benefit to them, as environmental migrants have no legal rights under South African or international law (McAuliffe and Klein Solomon, 2017). Finally, it is argued that, even if environmental reasons may not have come out as dominant in the Zimbabwean migrants' decision to come to South Africa, it is still important to interrogate their role and influence on the combination of pressures that cause people to move to South Africa.

d. The journey to South Africa and lack of official documentation

Most of the interview respondents indicated that they crossed the Zimbabwean-South African border illegally via the Limpopo River due to not having work permits in place. The river is considerably more difficult to cross when it is full, due to the risk of drowning and the presence of hippos and crocodiles, than when the riverbed is dry. However, the respondents indicated that they were willing to take the risk in order to pursue employment possibilities in South Africa. The following quotes illustrate the journey of migrants via the Limpopo River:

> *We crossed the river to come here because it's very difficult to cross at the border post without papers. After a few months I did get a passport, but now getting a work permit is a mission on its own. They give you three days to stay in South Africa, which is useless. Crossing the river becomes the only choice.*
>
> *It's scary when the river was flooded; crocodiles and hippos are out in numbers. Now the river is dry, but in January, it will be full. We've been away from work because of the flooded river, making it difficult to cross.*
>
> *In 2012, it was very full, but we crossed it. Back then, I wasn't as scared, but now I am because I know a lot of people who have died in that river.*

A number of the interview respondents had passports in place, but these are of no use without a work permit, which is very difficult to obtain:

> *I only have a passport, which I can't use because I don't have a work permit, so it's a useless document.*

Not having a work permit in place makes it difficult for migrants to live and work in South Africa:

> *If you're here as an illegal migrant, then you don't have freedom of anything. You are constantly looking over your shoulder like an animal. This is the main bad thing about being here.*

The border patrol does not seem to present too many problems to Zimbabweans coming into South Africa illegally:

> *Other soldiers are not good, but most of them are good to talk to, they understand our situations. When we want to go home to Zimbabwe, we have to tell them so they can be aware. It's easier if they know who you work for.*

> *They (the border patrol) ask you if you're working, and if not, they take you back. If you're working, they take you to your boss and ask for the staff register to verify whether you work or not.*

4.1.3 Application of the conceptual framework: Gaza Province case study

In this section, we apply the conceptual framework of Renaud et al. (2011) on how to determine whether individuals are environmental migrants and what kinds of environmental migrants they are. Here, use is made of the data from the surveys and interviews for this case study area and, where applicable, this data is supplemented with other literature.

a. Reason for displacement

For the Gaza Province case study, 69.8% of the survey respondents had been affected by the severe flooding of the Limpopo River in 2000 and/or 2013. During the 2000 floods, people were resettled in the Chiaquelane resettlement camp in the Chokwe District and to the Chinhacanine resettlement camp in the Guija District, but many decided to return to their original places of living after the flooding had subsided. During the 2013 floods, which led to the displacement of thousands more than the 2000 floods had, people were again resettled in Chiaquelane, but because there was not enough space, many people were also taken to Chinhacanine. According to the interviews with respondents from Chokwe and the Chiaquelane and Chinhacanine resettlement camps, government had invested in the two resettlement camps, particularly in Chinhacanine, through the provisioning of roads, water, schools and clinics to enable people to make a living for themselves in these areas. Here is a quote from a respondent who was resettled in Chinhacanine to illustrate the development the area has undergone since the arrival of people affected by flooding in 2013:

> *They used to fetch water from ditches. So, when we arrived, the government and aid agencies installed that big water tank over there and a secondary school. So, after Grade 8 our children can now attend Grade 9. In the past, the children used to go to Chokwe (40 km away) and Guija (30 km away). Some children dropped out of school because of these difficulties. With this new school, our children are able to attend school.*

Overall, the interview respondents from Chokwe town and the Chiaquelane resettlement camp, as well as those from the Chinhacanine resettlement camp, were in agreement that the 2013 floods exceeded the 2000 floods in terms of severity and damage caused. The following quotes illustrate this point:

> *Yes, the floods of 2000 were devastating. But the floods of 2013 were stronger than those of 2000.*

> *The floods of 2000 were not difficult, even though we were caught by surprise and did not measure the real dimension or impact. But the floods of 2013… aiii, they were very complicated and challenging. We lost everything because we underestimated the impact. We lost cattle, houses, goats, clothing.*

> *It was a lot of water that I have never seen before (2013 floods). Because of that water, we lost everything again. The pressure of the water was so big that even those who had means of transportation were not able to take anything. That water did not give us time to breathe. We had two vehicles and one wagon, but with the fury of the waters, everything was dragged, then we lost everything. We did not take anything. In those circumstances, we decided to leave Barragem and accepted to settle here (Chinhacanine), otherwise we could be killed by the water.*

The interview respondents' experience of the magnitude of both floods is supported by a number of authors. For example, Davies (2013) states that the Limpopo Valley suffered massive losses and damage in 2000, and that the areas affected were almost completely destroyed. Hundreds of people died from starvation due to being stranded without food or clean water, and agricultural lands and irrigation systems were wiped out, resulting in the loss of livelihoods of over 100,000 families. This topic is also analysed in great detail in the book *Mozambique and the great flood of 2000* (Christie and Hanlon, 2001). According to a consolidated early recovery strategy report by the Humanitarian Country Team for Mozambique (2013), an estimated 420,000 people were affected by the 2013 floods in Mozambique, with 150,000 people being temporarily displaced in Gaza, the most affected province in Mozambique. The floods caused significant damage to people's homes, to livelihoods like agriculture, cattle and trade, to basic social services such as schools, to healthcare centres and to community infrastructure like roads, bridges, electricity and drainage systems (Humanitarian Country Team for Mozambique, 2013).

While people were warned about the imminent arrival of both floods, and mechanisms were put in place to bring affected people to safety, many were reluctant to leave their homes for a number of reasons. According to the interviews with respondents from the Chokwe/Chiaquelane and the Chinhacanine resettlement camps, these reasons included not being able to foresee the magnitude of the flood (especially that of 2013 compared to 2000), the warnings being at too short notice, and not wanting to leave behind their belongings because they might be stolen by the people who stayed behind.

Here are some quotes to illustrate the points above:

> *People don't want to move. They compared floods. Firstly, they compared it with the floods of 1977 and said those floods weren't so big. So, people did not leave the place. They argued that the (2013) floods would not be as big as those of 2000. Because of that, they did not leave earlier. That's why they lost many things. A lot of people lost all the assets that they have, including houses and animals, and some died.*

> *We did not refuse to come. The police of Chokwe came to inform us that we had to be aware of the rising water because we were living in risky zones (flood of 2013). We were living in the lower zones. When the police left, people were not seeing water and decided to stay and not to leave. But, we realised that the water was reaching our machambas (agricultural lands). So, that's why we started to gather our belongings in order to leave the place. But it was too late. Most of us were surrounded by water. The water surprised us as we did not think that it would come so quickly. Water was coming from the ditches and then came towards our houses very quickly.*

> *Some said that they heard some rumours because they saw water in their fields (flood of 2013). But, we did not care. Since the water came suddenly, we did not have time to take anything.*

> *In 2013, the government also announced that water was coming and warned us to leave the lower areas. And we said: "they have started", they want to steal from us. We refused as in our previous experience some people did not leave the place that was going to be flooded and stole our things.*

Some of the respondents said that they had not received any warning of the impending floods and were caught completely off guard:

> *There are those of ARA-Sul (the company that manages the Mozambican Southern Basin), but they did not warn us. They did not inform us. They fled and we stayed with the floods. When we awoke that morning, we realised that it was completely flooded. Water entered during the evening.*

According to the discussion above, and in line with the conceptual framework of Renaud et al. (2011), the respondents that were displaced as a result of the 2000 and 2013 flooding of the Limpopo River, a rapid-onset hazard, can be classified as environmental emergency migrants.

b. Staying in the resettlement camp vs returning to the original place of living

Some people decided to stay in Chihaquelane, but from the interviews with respondents in the Chokwe and Chihaquelane areas, it could be gauged that a large number of people preferred to return to their original place of living in the "lowlands" (flood-prone areas) closer to Chokwe town. This was due to the lower lying areas having more fertile soils, and people being able to access water for irrigation more easily from the large irrigation channel that runs through the Chokwe District, or from the Limpopo River directly. Chihaquelane, on the other hand, is characterised by "sandy and salty soils" that are not suited for agriculture, as well as the absence of water for irrigation, frequent droughts and irregular rainfall, which respondents say has got progressively worse over time. The situation is well illustrated by the following quote from one of the interview respondents. This quote also suggests that some people have found a middle ground by living in Chihaquelane, but farming in the lower lying areas:

> *Because of a lack of rain and people being dependent on agriculture, the situation is terrible. There are entire families who are literally starving and have to ask for aid. They have received food in a free food distribution scheme run by Caritas and the Red Cross. However, people don't like to be dependent on that distribution because they have land, and they know how to do agriculture. What they want is water for their agriculture. They have found a solution, which is to do agriculture in the riverbed… The danger of doing this is that, in case of floods, they lose all their crops.. But there is a saying, which is: Those who do not risk do not eat.*

According to the interviews with people in Chokwe town and the Chiaquelane resettlement camp, other reasons why people prefer to go back to their original places of living include having a close connection to their original land ("the land is part of them"), their agricultural lands being too far from Chiaquelane, better opportunities for odd jobs, and better healthcare and other facilities in Chokwe town.

The situation differs for the interview respondents in Chinhacanine, where the majority said that they prefer to stay in the resettlement area, rather than return to their place of origin. Although they face similar difficulties as the people of Chihaquelane in making a living (as discussed in more detail in section 4.1.4), respondents stated that they had lost so much in the flood of 2013 that they never wanted to face that situation again. Here are some quotes from the interviews that illustrate this position:

> *Now I decided to stay here as I am not sure if these floods were the last in our lives. In my heart I still have the feeling that we will have more floods. We lost our belongings. We lost them twice, in 2000 and in 2013. We will not want to experience this three times. We will not return.*
>
> *I will not return, because I lost many things.*
>
> *We are no longer willing to live there, because we have had enough of rain and floods. We are tired of water. We don't want to be worried about any kind of rain. In the past, once it rained, we got worried that our houses would get flooded.*
>
> *Here it is good, because when it rains it does not create problems. We don't have that worry of floods. When it rains, it rains in a normal way. Not excessive water as we witnessed in Macarretane.*

In line with the conceptual framework of Renaud et al. (2013), the environmental emergency migrants can be further classified as environmentally forced migrants, due to the slow and ineffective recovery of their areas of origin, which makes it difficult for them to return. However, interestingly, the Gaza Province case study is also characterised by a number of people wishing to return to their areas of origin, for reasons discussed in the section above, despite these still being high-risk areas in which to live, and despite the Mozambican government strongly discouraging people from returning to these areas.

4.1.4 Reflections on and suggested amendments to the conceptual framework for categorising individuals who move due to environmental stressors

In this section, we reflect on a number of ways in which the conceptual framework of Renaud et al. (2011) fell short of explaining the situations pertaining to environmental migration and displacement in the two case study areas.

Regarding the events following a rapid-onset hazard, and those who have been displaced being classified as environmental emergency migrants, Renaud et al. (2011) divide such migrants into environmentally motivated or environmentally forced migrants. This difference in classification is determined by the migrant's choice not to return, even if the impacted area has swiftly and effectively recovered (environmentally motivated migrated). In the Gaza Province case study, the research team has, however, come across numerous examples of environmental emergency migrants who have chosen to return to the impacted areas they were forced to leave for a number of reasons. The dominant reason is that they are unable to make a living in the area to which they were resettled. This is a scenario that the conceptual framework of Renaud et al. (2011) does not explain at all. The question arises whether people who return to the impacted areas are no longer migrants at all, because they have returned. Does returning then deprive them of their migrant status? What about the respondents in the Gaza Province case study area who have homesteads in both the originally impacted area and the resettlement area, and who work in the impacted area, but live in the resettlement area? Do they become partial migrants? These are interesting theoretical questions that deserve further attention and discussion.

Regarding the loss of ecosystem services and slow-onset hazards, the framework of Renaud et al. (2011) specifies that environmentally forced migrants are individuals who have moved from places where alternative livelihoods are not possible, will take a significant time to implement or where the impacted area has disappeared completely (e.g. through permanent inundation due to riverbank erosion or a rise in sea level). It is argued that this scenario also applies to people who, according to the framework, cannot be classified as environmental migrants, because environmental factors were not the dominant reason for their migration. Here, it is argued that, even if people migrate predominantly due to economic reasons (as was the case with the Zimbabwean respondents), it is possible and even likely that they did not have any alternative livelihood options in their original places of living. For instance, in Zimbabwe, people without jobs or other economic means should ideally become self-sufficient by practicing subsistence agriculture. However, in the absence of reliable, regular rainfall, this potential alternative means of making a living is severely compromised, which also links environmental factors or stressors to such individuals' reasons for migration. The argument is therefore repeated that, even if environmental factors are not the main reason for an individual's decision to migrate, their impact and influence on this decision should be analysed and studied. The position of the research team on this issue is supported by a systematic review of 53 studies on environmental change and migration by Borderon et al. (2018) that focus on Africa. This review found there to be no evidence of environmental change being the sole driver of migration. Considering complex interactions between migration drivers is thus essential when examining the link between climate and migration.

4.2 UNDERSTANDING MIGRANTS THROUGH AN ADAPTIVE CAPACITY LENS

Secondly, the ability of migrants to adapt in the place to which they have moved is investigated through an adaptive capacity lens. Here, the focus is on the concept of adaptive capacity from a theoretical perspective, followed by the introduction of a conceptual framework to determine and assess adaptive capacity in the case study areas.

4.2.1 From adaptation to adaptive capacity

The concept “adaptive capacity” is derived from “adaptation” (Brooks, 2003; Gallopín, 2006; Smit and Wandel, 2006; Engle, 2011), which, according to the IPCC, is defined as “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” (IPCC, 2001). Authors who research adaptation are generally in agreement that a significant aspect of adaptation is the capacity of the system to adapt, especially over time, and in the face of hazards, to moderate risk in order to reduce social vulnerability (Brooks, 2003; Smit and Wandel, 2006). As such, adaptation is researched and understood within the context of an increasingly changing climate.

The characteristics of adaptation that give organisms or systems the necessary mechanisms to not only survive, but also reproduce in the face of environmental changes, have been debated, specifically within the natural sciences (Smit and Wandel, 2006). Engle (2011) uses the notion of adaptation to understand an organism’s ability to respond to its natural environment and, more importantly, to persist despite its environment through a process of learning and adjustment. Within the social sciences, adaptation has also received much attention. For example, anthropologist Julian Steward examined the extent to which culture adapts to environmental and technological factors (Steward, 1955). According to Janssen and Ostrom (2006), social scientists, in general, perceive adaptation to “include an adjustment in socio-ecological systems in response to actual, perceived or expected environmental changes and their impacts”. Within the social sciences, therefore, adaptation is seen as context-specific and case studies are used to illustrate findings.

Other social scientific work on adaptation examines society and its cultural adaptation to climate variability through history (Orlove, 2005; Brooks, 2006), society’s vulnerability to environmental hazards and the ensuing food insecurity (Dilley and Boudreau, 2001), and the adaptation of practices that allow for cultural survival (O’Brien and Holland, 1992; Adger, 2000; Adger, et al., 2003). Interestingly, Adger et al. (2003) argue for the inclusion of a discussion of the role people or stakeholders play in adaptation, in other words, people, as social agents of adaptation across various geographic scales, their interests, as well as their motives for response. Adger et al. (2003) therefore suggest that adaptation may not be a neutral concept as it can be “motivated by many factors, including the protection of economic wellbeing or improvement of safety”. Pelling and High (2005) similarly note that social adaptation can be reactive and anticipatory, while also being spontaneous or planned. Lastly, Pelling and High (2005) argue that one should take note of the fact that, while social adaptation may be stimulated by non-climatic factors, these factors also influence the capacity of society to deal with environmental and climate-related hazards and stressors (Pelling and High, 2005). The difference between adaptation and adaptive capacity is illustrated in Figure 4-7.

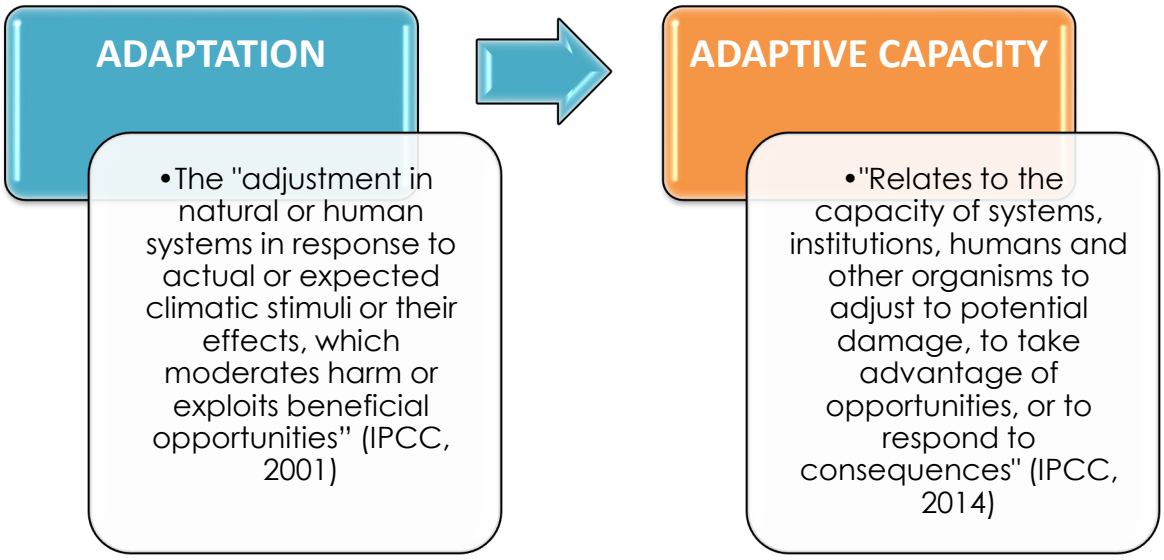

Figure 4-7: Definitions of adaptation and adaptive capacity

Adaptation has emerged as an important concept, especially in climate and global change literature, and specifically in relation to the capacity of humanity to adapt (Vincent, 2007; Engle, 2011). According to Engle (2011), adaptive capacity is simply the ability to adapt. However, this is a simplistic definition. The IPCC (2014) defines adaptive capacity as relating "to the capacity of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities or to respond to consequences". Other authors, such as Burton et al. (2002), suggest that adaptive capacity is about a system's ability to adjust to climate change to limit any damages. This adjustment includes a system's ability to find the benefits and limit the costs of the adjustment. Adaptive capacity, according to Vincent (2007), is about the change of flow in resources, which is linked to the different capitals (such as social and natural capital), and how these resources are applied to adapt. A number of authors also define adaptive capacity in terms of resilience, where adaptive capacity is a characteristic of a socio-ecological system and its resilience, with a specific focus on learning and experimentation to adopt novel solutions (Walker et al., 2002; Armitage, 2005; Folke et al., 2005). Gallopín (2006), in turn, argues that, in relation to a socio-ecological system, the concept of adaptive capacity should be viewed in terms of two components. The first component is the capability of the socio-ecological system to manage and maintain its condition, despite changes in the environment. This component is not much different from what other authors are saying. However, the second component is slightly more aspirational. Here, Gallopín (2006) suggests that adaptive capacity should also include the ability to improve one's condition consistently and not only if the system within which one is situated changes, and, in addition, that one should strive to increase the scope of environments to which one is adapted.

4.2.2 Determining and assessing adaptive capacity

O'Brien et al. (2004) argue that most of the definitions of adaptive capacity are linked to the notion of vulnerability. They argue that these interpretations are either "end point" (a measure of adaptation options and whether they can be implemented in the future) or "starting point" (the present ability to cope and respond to stressors' interpretations of vulnerability) (O'Brien et al., 2004). Smit and Wandel (2006) also argue that adaptive capacity is another way of looking at vulnerability. Instead of asking how vulnerable a community or place is, they argue that one asks what the adaptive capacity of that community or place is. They argue that the determination of such adaptive capacity involves the selection of variables, indices or criteria, which are then subjected to a comparative evaluation or rating. They argue that these indices are normally chosen by the analysts themselves and that there is little room for local inputs, yet such inputs can occur (Smit and Wandel, 2006). Brooks (2003), however, argues that the connection between adaptive capacity and vulnerability is subject to the timescales and hazards that are faced.

The scale at which adaptive capacity should be measured has also received a lot of attention in the literature. As such, adaptive capacity has been described as being "context-specific" (Smit and Wandel, 2006), "multidimensional" (Vincent, 2007) and a "scale-dependent concept" (Adger and Vincent, 2005). Authors argue that these scales should not be seen as independent from one another (Adger and Vincent, 2005; Smit and Wandel, 2006) and that they cut across different levels, from households to national governments (Adger and Vincent, 2005; Smit and Wandel, 2006). Vincent (2007) asks an important question with regard to how one could possibly measure adaptive capacity or gain any insight if the concept is so context-driven. Researchers generally agree that developing a list of generic determinants of adaptive capacity will deal with the issue of context (IPCC, 2001; Adger and Vincent, 2005; Smit and Wandel, 2006; Vincent, 2007; Engle, 2011). In fact, Chapter 18 of the IPCC report on impacts, adaptation and vulnerability (IPCC, 2001) speaks about how adaptive capacity may vary across systems, sectors and locations, and how the determinants of adaptive capacity may include specific characteristics that speak to these systems, sectors and locations. Yohe and Tol (2002) argue that the determinants of adaptive capacity play a role in defining coping ranges and thresholds beyond only the change and variability of the environment. These determinants should, however, not be seen as being independent of one another, but may also manifest differently in different contexts (Smit and Wandel, 2006). The outcome of much of the research into adaptive capacity has been to use a generic list of determinants of adaptive capacity to develop a predictive model that can help one to better determine the adaptive capacity of systems, communities and even nations into the future (Yohe and Tol, 2002; Adger and Vincent, 2005; Yohe and Tol, 2007; Hinkel, 2011).

There are a number of examples of lists of determinants and frameworks to assess adaptive capacity. Table 4-1 provides an overview of some of the prominent examples.

Table 4-1: Examples of lists of determinants and frameworks for assessing adaptive capacity

Author	List of determinants or framework to assess adaptive capacity
Smith et al. (2001) (IPCC) **Determinants of adaptive capacity in the context of climate change**	1) Economic resources; 2) technology; 3) information and skills; 4) infrastructure; 5) institutions; 6) equity
Yohe and Tol (2002) **People and societies in relation to adaptive capacity**	1) The range of available technological options for adaptation; 2) the availability of resources and their distribution across the population; 3) the structure of critical institutions, the derivative allocation of decision-making authority, and the decision criteria that would be employed; 4) the stock of human capital, including education and personal security; 5) the stock of social capital, including the definition of property rights; 6) the system's access to risk-spreading processes; 7) the ability of decision makers to manage information, the processes by which these decision makers determine which information is credible, and the credibility of the decision makers themselves; 8) the public's perceived attribution of the source of stress and the significance of exposure to its local manifestations
Vincent (2007) **National Adaptive Capacity Index (NACI) for comparing adaptive capacity among African countries**	1) Economic wellbeing and stability; 2) demographic structure; 3) global interconnectivity; 4) institutional stability and wellbeing; 5) natural resource dependence
Jones et al. (2010) (ODI) **A framework for analysing adaptive capacity at the local level**	1) Asset base; 2) institutions and entitlements; 3) knowledge and information; 4) innovation; 5) flexible, forward-looking decision-making and governance

In order to examine the two case studies through an adaptive capacity lens, the research team decided to make use of the framework suggested by the ODI (Jones et al., 2010): the Local Adaptive Capacity Framework (see Table 4-2). The LAC is ideal for the case study analysis as it deals specifically with communities and individuals at local level. It also aims to move "away from simply looking at what a system has that enables it to adapt, to recognising what a system does to enable it to adapt", thus taking into account the role of the processes and functions at the local level that can support adaptive capacity (Jones et al., 2010). An additional important characteristic that ties to adaptive capacity is that of an affected community's resilience, or ability to recover or spring back from a disaster or misfortune. For the purposes of this study, "the system" refers to migrants in their receiving countries or places.

Table 4-2: Local Adaptive Capacity Framework

Adaptive capacity at the local level	
Characteristic	**Features that reflect a high adaptive capacity**
Asset base	Availability of key assets that allow the system to respond to evolving circumstances. These can be both tangible and intangible assets. Often also referred to as capitals.
Institutions and entitlements	Existence of an appropriate and evolving institutional environment that allows fair access and entitlement to key assets and capitals. Can be both informal and formal institutions – these institutions encompass the rules and regulations that govern belief systems, behaviour and organisational structure.
Knowledge and information	The system has the ability to collect, analyse and disseminate information in support of adaptive activities.
Innovation	The system creates an enabling environment to foster innovation, experimentation and the ability to explore niche solutions in order to take advantage of new opportunities.
Flexible, forward-looking decision making and governance	The system is able to anticipate, incorporate and respond to changes with regard to its governance structures and future planning.

In the following two sections, the adaptive capacity of migrants in each of the two case studies will be examined. The LAC's characteristics will be followed to provide structure to the discussion.

4.2.3 Application of the LAC conceptual framework: Limpopo case study

a. Asset base: Availability of key assets that allow the system to respond to evolving circumstances

The respondents in the Limpopo case study do not generally have a lot of access to or control over assets. Because these people are very poor, tangible assets or capitals such as natural, physical and financial capital are hard to come by and retain. The lack of these assets is one of the contributing reasons why these migrants moved from their homes to another country. A number of respondents noted that they had lost everything in their countries of origin. For many, this included their land and their house.

Not having any tangible assets or capitals becomes part of the reason why migrants want to move, so that they can build up these assets again. However, what is interesting for the receiving countries is that the migrants often tend to rebuild some of their access to and control over tangible assets in their countries of origin. This was seen, in particular, with migrants from Zimbabwe who were able to move mostly unhindered across the border. Respondents tended to want to rebuild houses and homesteads back in Zimbabwe and many reported using the money they made in South Africa to buy and rear livestock at home. Such investments of the respondents in their communities of origin contribute to increased levels of adaptive capacity and resilience to future environmental disasters.

For example, two respondents noted:

> *I moved alone, I left my wife and twins. She is at home taking care of my cattle and responsible for dipping, etc. I take care of my family. I send money home and my brothers also assist my wife at times, and I pay them back the money.*
>
> *I moved alone, there was no way I could migrate with my children. They had to look after the little livestock we had; goats and chickens. Their only responsibility was to sell some livestock and live off the rest. I'm currently the only one supporting them.*

These comments also point to the fact that respondents tend to move on their own, often as two parents or one parent who comes to work in South Africa and sends money and food back home. As such, in some cases such as Zimbabwe, the family structure, while divided by a national border, is often kept intact in the country of origin. However, in order to do this, intangible assets or capitals become an important source of support. Intangible assets or capitals are those that are linked to the human and social aspects of life, and while difficult to measure quantitatively, the research showed that they are essential to the adaptive capacity of individuals. For example, intangible assets are things like strong networks between family members, neighbours or even people coming from the same village. People want to be assured that their children and families back home are taken care of. They also want to be assured that any money or goods that are sent back home reach those for whom they are intended. Intangible assets serve to provide this peace of mind for migrants, and can determine whether one is able to adapt to one's new destination. Again, social and familial networks play an important role here as people rely on these networks to help them find employment or a safe place to stay until they are able to make it on their own. For some migrants, even intangible assets such as networks are hard to come by. Those coming from war-torn countries such as the DRC have lost contact with their family and friends, and have to forge new support networks in the country of destination. This ability becomes an essential part of one's capacity to adapt.

A tangible asset that is often overlooked, but that plays an essential role in securing intangible assets, is access to a cellular phone. It provides access to those back home, especially in the case of Zimbabwean migrants, and is the key to accessing one's networks in one's new country. Most importantly, it is a lifeline to employment. The importance of a cellular phone as an asset to migrants became very clear one morning as the CSIR team arrived at the women's shelter in Musina. The team was told that the evening before, all the women's cellular phones had been stolen while they were sleeping. For many of these women, this was a major blow to their ability to survive. One woman had just arrived from the DRC. The number of her brother who lives in Johannesburg was saved on the phone. She was supposed to let him know she had arrived the next day and he would give her his address so that she could join him in Johannesburg. She did not know his number, and he was unaware that she had arrived. She also did not know his address so she could not go to him. As a result, she was stuck in Musina with no way of contacting her lifeline. Other women had similar issues. For many, the fact that their employers, for whom they work part-time, can no longer get a hold of them was a significant blow to their ability to survive.

b. Institutions and entitlements: The existence of an appropriate and evolving institutional environment that allows fair access and entitlement to key assets and capitals

Respondents in the South African case study come from different African countries and, as such, the institutional context from whence they come differs. These institutional contexts contribute to the socialisation process of individuals, families, households and communities to a particular worldview. This may include behavioural rules and beliefs relating to assets, their access to and power over these assets, as well as labour, for example, ownership of property, and rules with regard to land tenure and division of labour. Respondents from Zimbabwe, for example, noted that there is not much of a difference between Zimbabwe and South Africa with regard to these kinds of institutions.

Since migrants do not generally have the financial capital to own any land in South Africa, rules regarding the ownership of property are not an issue. In addition, the case study respondents included both men and women, where both men and women have a variety of occupations, including farm labouring. Thus, when it comes to entitlements to land or property, societal rules do not play a major role in the adaptive capacity of the respondents.

South Africa itself has a long history of migrant labour within its own borders. This was especially the case during the apartheid era, where, due to the Group Areas Act of 1954, young men and women migrated to the urban centres in search of jobs to send money back home to their families in the homelands. As such, the idea that families are split up and that there is a proverbial home to which money is sent is not a foreign concept. South Africans, particularly those living in border towns such as Musina, are therefore accepting of the way in which Zimbabwean migrants are forced to seek work in a different place to that in which their families are located. Local governance structures, such as traditional authorities and chieftainships, have been reported to be particularly accepting of this. For example, the local headman generally welcomed the respondents and registered them within two or three days. Linguistic similarities with the residents of Musina (of multiple nationalities) also helped many of the respondents to adapt. In cases where they did not speak the local languages before moving to South Africa, they made an effort to learn them, for example:

> *No, I am Venda, and most people around here are also Venda, so it has been smooth.*
>
> *No, I am fine here. I am Ndebele, but I speak most of the Nguni languages. Most people here speak Venda and Shona, but over the years, I have also learnt these two languages.*

Seeking and obtaining employment is an important aspect of migrants' capacity to adapt. In order to gain access to employment in South Africa, migrants have to have formal documentation. For those migrants who come from war-torn countries such as the DRC, formal documentation comes in the way of refugee status. This allows them to move freely and, after a while, to look for employment. Others who do not qualify, either have to apply for a work permit or work illegally. Many Zimbabwean migrants, by their own admission, are in South Africa due to drought – they could no longer make it in their own country and therefore came to South Africa looking for new opportunities. Institutional entitlements with regard to working are, however, not on their side as they are unable to obtain refugee status, and obtaining official documentation to work in South Africa is difficult and can cost a lot of money. This research has shown, however, that employment is essential to migrants being successful in adapting to their new situation. As such, the ability to work and access a work permit is a major constraint to their adaptive capacity. A discussion among a group of Zimbabwean women during a focus group discussion illustrates this point well when the facilitator asked them what advice they would give to others coming to South Africa:

> *Respondent 1: They need to get their passport, get a job and they'll be okay.*
>
> *Respondent 2: They need to enter South Africa legally and not via the river because it's dangerous.*
>
> *Respondent 3: I'll tell them to come to South Africa, but they need to prepare their papers. There's no point in coming if you have no legal documentation.*

This research has shown that many respondents have some form of employment, be it seasonal, part-time or full-time. In the surveys, it was noted that a large majority of the jobs are in the agricultural sector (mainly due to the fact that Musina has a fairly well-established farming economy). However, many also noted that they are employed informally. Access to employment is essential to the respondents' adaptive capacity. Without this, they cannot survive. While some international migrants are able to secure employment without formal documentation, these are often not secure or good jobs. In desperation, women, for example, sometimes take employment that compromises their health and safety, such as prostitution. In the short term, such employment can contribute to their survival, but this is not sustainable. In the long term, it actually diminishes their capacity to survive.

c. Knowledge and information: The system has the ability to collect, analyse and disseminate information in support of adaptive activities

Knowledge and information play an important role in the ability of migrants coming from other countries to adapt in South Africa. Intangible assets, such as networks, are key to this. This research has shown that there is a regular flow of information back and forth between sending and receiving countries. There are different types of information that are essential to the survival of migrants in South Africa to adapt both pre- and post-arrival:

- *Which country to migrate to*: For some migrants, this decision is predetermined as they have friends and family already established in that country. The Zimbabwean respondents, in particular, had very specific reasons for coming to South Africa as they had already received information with regard to employment opportunities. Other migrants, such as those from the DRC and Burundi, seldom have a lot of information, only that there is peace in South Africa. The team encountered many respondents who said that all they knew was that they had to find safety here.

- *The migration journey:* The journey to South Africa for migrants who come from countries further afield is often fraught with danger and uncertainty. Making use of big trucks as transport seems to be a common way of making the journey down to South Africa. This does not come cheap, as people have reported having to pay up to US$100 for this opportunity. Women with children are particularly vulnerable as they have very little choice – either pay up or be left behind. While not articulated as such, many of the female respondents alluded to the fact that if they could not pay, there were always other “methods of payment” they could explore. In other words, sexual favours were exchanged for safe passage.

- *Best method of entry legally:* There is a lot of information shared between respondents on how to obtain the correct papers, either as refugees or as migrants. Respondents who are seeking asylum noted that their friends and families coached them in terms of what to say to the officials who would interview them upon entry into South Africa. What to say, what not to say and how to say it are important pieces of information that can make or break a migrant’s application to obtain refugee status.

- *Best method of entry illegally*: Zimbabwean respondents noted that information is particularly important in terms of entering the country illegally. Good information and knowledge with regard to the border patrol patterns can ensure safe passage into the country. Safety is also a huge concern for those entering the country illegally, especially for those crossing the Limpopo River into the country. Zimbabwean respondents noted how they have learnt over the years how to cross in groups of people. Not only does this help in terms of keeping a lookout for border police, but more importantly it helps with safety as there are criminals who hide in the bushes and prey on individuals, stealing all their belongings and money, and often assaulting women and young girls. An important part of the Zimbabwean migrant’s adaptation strategy is to move freely across the border back and forth between South Africa and Zimbabwe. The ability to do so is paramount to their adaptive capacity.

- *What to do when you arrive – where to find shelter*: For migrants, possibly their most significant moment of vulnerability is when they arrive in the country for the first time. The knowledge of what to do and where to go is essential. Many respondents noted that their networks and connections told them what to do and where to go. Respondents who do not have these kinds of networks found it more difficult. One respondent from Rwanda travelled with her two small children. She recounted how she arrived at 02:00 in the morning and did not know what to do or where to go. She noted how a man whom she did not know gave her and her children a lift from the border to Musina, and from there gave her directions to the Catholic Church’s women’s refugee shelter. Many other women had similar stories of Musina residents sharing this important information with them upon arrival.

Once a person is settled, there are different kinds of information that become essential to the sustained survival of the migrants. For example:

- *Where to find employment:* It is known that most respondents find some sort of employment. The ideal, however, is to find employment that is good work and that is permanent. The research uncovered a number of farmers in the Musina area who are particularly sensitive to the plight of the migrants, and provide employment for these migrants, even for those who do not have official papers. The employment on these farms is mostly in the form of farm labourer jobs. However, they generally pay relatively well and one can depend on the income. Speaking to the migrants who have found employment on these farms, it became clear that networks played a pivotal role in securing their jobs. For example, a respondent who works on one of the farms noted that: *"Most people from my neighbourhood told me about this farm. So, I decided to come, and ask them for a job, that time, their older brother was still in charge."* The team also tested this with migrants at the shelters – very few of them knew about the jobs on the farms. Clearly there is a group of migrants who makes use of this knowledge network to find and secure employment.

- *Access to health services*: A number of respondents noted that one of the main reasons they chose to come to South Africa was because they knew that basic healthcare was free there. A local health official noted in an interview that primary healthcare providers are obliged to provide healthcare services to human beings irrespective of their nationality: *"We always joke with locals when they try to discriminate, that HIV/Aids or malaria doesn't choose who has legal documents or what their race is, it just attacks."* Respondents from Zimbabwe noted that people in Zimbabwe know this. In a focus group interview with Zimbabwean women, this issue was discussed, for example:

  Respondent 5: Back in Zimbabwe, you pay for everything.

  Respondent 1: I've given birth in Zimbabwe and I had to pay for it. If you have no money, they take something from your house, e.g. chickens, but this happens in the rural hospitals.

  Respondent 2: My uncle has had to sell his house just to cover his hospital bill. There's no public or private healthcare in Zimbabwe, you pay for everything. You pay for each pill, each stitch, etc.

  Respondent 1: Here in South Africa, everything is free and it is good healthcare.

  The team also noted that many women came to South Africa specifically to give birth. A number of ladies argued that they planned their birth in this way because they knew from others and their own previous experience that it is much better to give birth in South Africa than in their own countries.

- *How to stay safe – especially for those who are here illegally:* Moving into a country without having the legal papers to ensure your legitimacy and safety requires certain kinds of knowledge. Many of our respondents noted that one of the most important things a migrant who is in South Africa illegally needs to know is how to bribe people, be they government officials, border post officials or even just border patrol officers. This includes knowledge about who one can or should bribe, and more importantly, what the going rate is. One does not want to pay too much and set a precedent, and therefore knowing how much is expected is also important information to have. Bribes are often paid for gaining access to the country without having papers. People who work on farms illegally also have to be careful of being stopped by patrol officers who will ask them for their papers – bribes often help to smooth the way and ensure that you remain in South Africa.

d. Innovation: The system creates an enabling environment to foster innovation, experimentation and the ability to explore niche solutions in order to take advantage of new opportunities

The survival of any system in a changing or changed environment is heavily dependent on its ability to adapt through innovation. Innovation, in this sense, does not have to be technological advancement, although this kind of innovation is often highlighted as it is easily quantifiable. However, especially in the case of migrants, innovation that enhances adaptive capacity comes in a number of different forms.

Innovation, or finding a different way of coping, is essential for migrants, especially because they have limited entitlements to the official support structures that are available to the residents of the receiving country. For example, the survey data revealed that only 16% of the survey respondents are able to make use of formal credit solutions within South Africa. Rather, the migrant respondents make use of informal credit solutions (50%) or none at all. Instead, migrants rely on their intangible assets to help them with financial solutions. For example, one respondent noted:

> *I have friends here and we help each other financially, for example, when they call me at home and there is a problem and I have no money, I ask them to lend me money and even the boss assists you financially when you need him too.*

A well-known form of innovation migrants utilise is being able to send and receive money from home – also called remittances. The survey data revealed that, in the last year, just under 60% of households sent and received remittances. Figure 4-8 shows that, in the last year, 26% of households spent between R1,000 and R5,000 on remittances; 13% spent between R5,000 and R10,000; 13% spent between R10,000 and R15,000; 3% spent between R15,000 and R20,000; and 7% spent between R20,000 and R25,000. Remittances also present a key way to boost the resilience of a household. For example, drilling a borehole will enable the household to continue irrigating their crops, even in the face of irregular rainfall or drought.

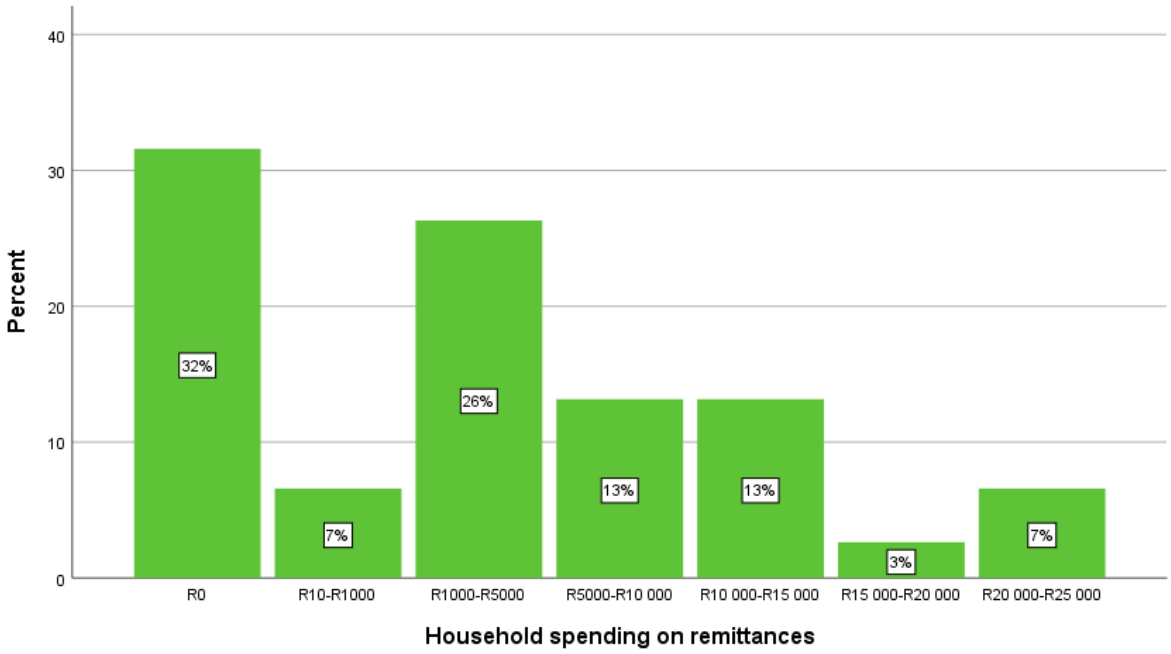

Figure 4-8: Household spending on remittances in the last year

The survey data also revealed that remittances play a large role in the wellbeing of the household as a whole, as more than 61% of respondents noted that the whole household benefits from remittances.

Remittances are used to pay for school fees, purchase cattle, build accommodation, save to drill a borehole and buy a pump, and buy groceries. Here follow a number of quotes to illustrate the use of the remittances sent home by migrants who are farm labourers:

> *I bought one cow and also built my house. I also sent money home for my children's school fees.*
>
> *I've purchased a plot back home, so I need to start building a house. I have started sending money for building equipment.*
>
> *I am working here because I am trying to get a borehole and a pump to start planting and irrigating my farm. I own a piece of land back at home.*

Sending the remittances home is not easy, and people have to innovate to ensure the safe transfer of goods and money. Sending money via formal channels is not ideal as companies charge quite a bit of commission for their service. A more informal way of transferring remittances is to cross the Limpopo River and meet the recipients of the remittance close to the border post:

> *I cross the river and meet them at the nearest township, which is Beitbridge, and they go back home to Bulawayo. If I use eco-cash, by the time they withdraw, there would be nothing. The deductions are too high. Crossing the river and giving them the physical cash works better.*

Innovation around support structures is also extremely important. Migrants tend to diversify their support structures to ensure that if they require assistance, they are able to get it. In turn, they become part of support structures to others, thus ensuring mutual benefit. A number of support structures are important when the migrants start settling into their new life in South Africa. The respondents' employer was mentioned repeatedly as someone who would assist in problem cases, for example, by lending or advancing money, or by teaching workers the skills they need. Respondents also rely on the friends they have made in South Africa (often co-workers), and very importantly, the churches that they attend. Here are some quotes to illustrate the existing support structures of which the respondents make use:

> *We also have church, so some church members help when they can. Maybe if I am in need of food or money.*
>
> *When I'm out of mielie meal, I can ask my bosses and they deduct it from my salary. At the compound, I have friends who help me if I'm really in need of money or food.*
>
> *One of the farm owners is a pastor, so once a week he invites us for a bible study. No one is forced to participate, it's voluntary. He sends drivers to pick us up and drop us off at the compound. He is a very nice man; he's also a counsellor, if you need anything, whether it is money, someone to speak to or if you are sick, he's always there to lend a hand or an ear.*

e. Flexible, forward-looking decision making and governance: The system is able to anticipate, incorporate and respond to changes with regard to its governance structures and future planning

Adaptive capacity is strengthened by forward-looking approaches and future planning. For migrants in South Africa, this relates to the way in which they are able to structure and set up their lives towards a sustainable future, not only for themselves, but also for their households back home. For some, it means having a particular strategy for making it or assuring success. For example, one respondent noted that what makes her different is her work ethic:

> *I think I've adapted quite well from 2006. I came here looking for a job, I worked extra hard so that my employers noticed and called me back and offered me a permanent position. Yes, the money wasn't that great back then, but now it is way better than before. I can say I'm happy. Migrating to South Africa was a good decision because I can send money home. I plan to have a chicken business back home. This is after I realised how chickens are in demand in Zimbabwe.*

This particular respondent is also thinking about the future in terms of setting up a business now while she is still in South Africa to enable her to go home eventually. Adaptive capacity is also about identifying possibilities and options. Many respondents who work on the farms have realised that one should perhaps not only look for permanent work, as there are many opportunities in terms of seasonal work. For example, temporary employees go home regularly to see their families, but mostly return to continue working when work (e.g. harvesting vegetables or fruit) becomes available again.

Regarding employment, many of the respondents, who are now working on the farm, have changed their employment from what they used to do in Zimbabwe. This has also necessitated the learning of new skills, which they have learnt from their employer. The respondents stated that they are considerably better off financially than they were in Zimbabwe, and that they are able to reinvest their earnings in their communities in Zimbabwe to improve the living conditions there. Here are some quotes that illustrate the employment situation of the respondents:

> *Here at the lodge, I work as a painter and I sometimes help with garden work when there is no painting work. I am happy here and the job is fine, but given the opportunity, I would be a farmer.*
>
> *My life has changed ever since I moved here, I am better now because in Zimbabwe we were starving and almost died of hunger, but now I am able to send money home.*
>
> *My life has changed, many people from my village think I earn a lot of money because I've improved my family's standard of living. I'm respected more, people come to me asking for piece jobs back home, so I also help where I can.*
>
> *Of course, I can now drive a tractor, operate a TLB, I've even worked in the office where I learnt some administration.*

4.2.4 Application of the LAC conceptual framework: Gaza Province case study

a. Asset base: Availability of key assets that allow the system to respond to evolving circumstances

Assets and the loss of assets are a significant consideration in the adaptive capacity of migrants in the Mozambican case study. In this case study, respondents from both Chiaquelane and Chinhacanine reported a significant loss of tangible assets due to environmental hazards, particularly the floods of 2000 and 2013. Homesteads and agricultural fields were lost due to the floods and, as such, their source of livelihood as well. After the floods, the government and donor agencies concentrated on restoring some of the assets so that displaced people could rebuild their lives. However, this was a protracted process as some chose to stay in the places to which they had been relocated, while others wanted to return. A respondent from Chiaquelane gave an account of what happened during the 2000 and 2013 floods:

> *I witnessed the floods of 2000 and again of 2013. When people arrived here, they went to the Headquarters of our village near the primary school. They went there because there was no other place where they could go. They sat outside and then we, as leaders, came and rescued them from that place. At the beginning, we gathered them under a cashew tree to be protected against the winds. We feel they were more protected under the cashew tree than in front of an open space. This happened for just a couple of hours, while we were distributing tents to them and mosquito nets. Each individual erected his or her tent on a given plot of land. We gave them mosquito nets because, in the floods of 2000, this place was full of mosquitos. It was one tent per family as they have children. Later, they were given food. They were coming from various villages, such as N'Konhane, Massavasse, Chokwé, Lionde and Machikolwane. Each ward secretary called his or her people. Then they were given food, blankets and tents.*

> *Then we reached a phase that people said: Even if the waters disappear, they wouldn't return to their previous places of residence. They spoke with the community leader and then the leader showed them the places where they could build their houses. For those who said they would return, they were staying in tents in the resettlement area. However, the government, with the support of NGOs and the Catholic Church (CARITAS), built small houses for those who were poor and had lost everything. These houses had two bedrooms and one living room. Obviously, there is more demand than supply and the priority was given to people with disabilities. They used grass and sticks to build their houses. Some declared that even in these conditions, they would not return to Chokwe.*

For both groups of displaced people, those who wanted to stay and those who wanted to return, the consideration of a loss of and rebuilding of assets became an important consideration. For those who wanted to stay, the rebuilding of tangible assets proved too high a price. In the Chiaquelane resettlement area, respondents mostly ended up going back to Chokwe, as people felt that they had personal assets left in Chokwe, which were still of value to them, and that the government's assets, such as infrastructure, were more readily available in Chokwe than in the resettlement camp.

In Chinhacanine, however, respondents noted that they had lost so much during the floods of 2013 that they would prefer to stay in the resettlement camp and only return to their areas of origin for agricultural purposes. Respondents noted that a major difference for them (as opposed to Chiaquelane) was that the resettlement area in Chinhacanine had received more investment from government in terms of infrastructure and support. As such, they felt they were in a better position to rebuild their assets there than in their areas of origin in other parts of the Guija District.

Intangible assets have also played a role in the resettlement of displaced people in the two resettlement areas of the Mozambican case study area. Within this context, intangible assets can be identified as the way in which displaced people are embraced within the host communities of Chiaquelane and Chinhacanine. Feelings of being welcome and belonging speak to their ability to integrate into their host communities and create new networks and trust relationships. Displaced people from Guija reported a stronger sense of belonging than those from Chokwe, which one could link to their wanting to stay in their resettlement area, rather than wanting to return. The presence of tangible social assets, such as churches, also played a part. For example, respondents from Chinhacanine mentioned the role the church played in restoring their lives:

> *The Apostolic Old Church helps, yes. I say that because, during the floods of 2000, we were given zinc plates. Each family received 12 zinc plates. Now, in 2013, we got aid in the form of clothes. Those white cloths of the church. If someone did not have this, it is because there were a lot of people. Also, we were given normal clothes. I mean, clothes that we can wear in our daily life. These white garments are meant for Sunday services and other church celebrations. Other people received sarongs, head scarfs, both female and male clothes. They helped us.*

b. Institutions and entitlements: Existence of an appropriate and evolving institutional environment that allows fair access and entitlement to key assets and capitals

In Mozambique, land is of extreme importance. The survey data shows that almost 80% of the Mozambican respondents are unemployed, with less than 20% having temporary employment (see Figure 4-9).

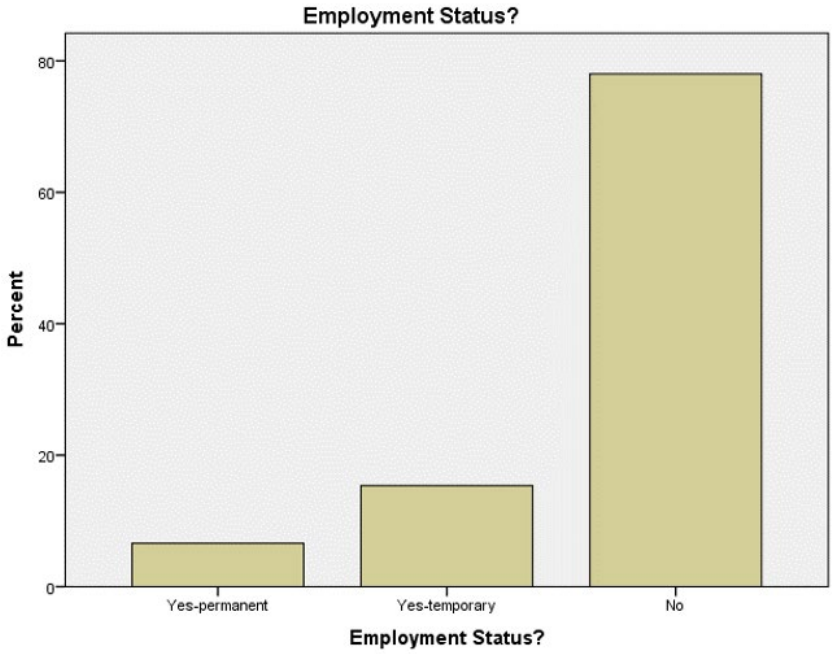

Figure 4-9: Employment status of the Mozambican survey respondents

Due to these extremely low employment levels, people rely heavily on their land and agriculture for their livelihoods. This is also the case for displaced people, specifically in relation to security of land. The respondents in Mozambique noted that displaced people often get a plot of land from members of the host community on which to plant vegetables so that they can produce food to eat. However, the land is often only on loan, and they have no security of land or tenure on the land. For example:

> *If they give you a land for agriculture, it is only for places suitable for vegetables (leaves). But they give it to you on a temporary basis as the owner can, without notice, ask for his or her land back. The argument is: We did not give it to you. We only lent it to you.*

Without security of land and tenure, people are not only vulnerable, but the opportunity for them to plan for the future is diminished, and as such, their adaptive capacity and resilience are extremely low too.

Directly after the floods, displaced people were in desperate need of help. Many were hungry and had no way of feeding themselves as their own lands, crops and potential harvest had been swept away by the water. In desperation, the displaced people invaded the crop lands of people who had not been affected by the floods in the same way. Under normal circumstances, this type of behavior would not be entertained, but the sense that these people were “in need” overrode the indignity felt about having one’s harvest stolen. For example, a respondent whose fields had been raided explained the situation as follows:

> *During the 2000 floods, our community suffered damages in their fields as people in need invaded the plantations of peanuts (groundnuts), cassava and vegetables. We couldn’t forbid people to use the crops in others’ fields because they were in need. However, as leaders, we had to intervene through sensitisation for not using the entire harvest. After that, we realised that people understood. We perceived them not to be prejudiced, but to help them as they are our brothers and sisters, who unfortunately lost their belongings due to the floods.*

As a community made up of a host community and displaced people together, the adaptive capacity of the community as a whole benefited from some people relinquishing their entitlement to their own harvests. In the short term, this kind of cooperation worked well. However, the respondents alluded to the fact that the host communities also felt somewhat taken for granted.

In a country such as Mozambique, where almost everyone is poor and struggling to make a living, becoming a host community to displaced people can be a drain on one's resources. In general, while people were open to receiving the victims of the floods, the host communities felt that when it came to receiving help from the government, they should also have benefited. For example, a respondent from a host community noted the following:

> *It is difficult for us to live with the people who came because of the floods: We receive them very well and there are no complaints about their presence because we are all humans. As a matter of fact, we host them in our houses and eventually we give them our land. But when it's time for the distribution of food and other stuff by the government, we are left behind. It is not fair.*
>
> *They [the government] argue that they only distribute food to those who came due to floods. But the issue of suffering is equally distributed as we, as a host community, also suffer because we have to share with them. We also suffer because we don't have food. But they allegedly say that it is only for the flood people. It is hard to accept it, because we also suffer. We just look at them without being able to do anything.*

Taking these comments into consideration, it is interesting to note that, while the adaptive capacity of displaced people is enhanced by the host community's willingness to take in and share their resources with the displaced families, their own adaptive capacity may be diminished in the process. The fact that the government has to rely on its own citizens so heavily to help, decreases the ability of the host communities to ensure their own survival.

c. Knowledge and information: The system has the ability to collect, analyse and disseminate information in support of adaptive activities

Knowledge and information are an essential component in the adaptive capacity of an individual, community or settlement. In the Mozambican case study areas, it is seen how context plays an important role in the adaptive capacities of these communities. In fact, as earlier noted, adaptive capacity is, in its essence, linked to context-specific actions and considerations.

The survey data revealed that 70% of the respondents surveyed only had some sort of primary school education (see Figure 4-10). This is an extremely low number. However, it also points to the fact that people here tend to learn and gather knowledge in different ways than typical formal schooling.

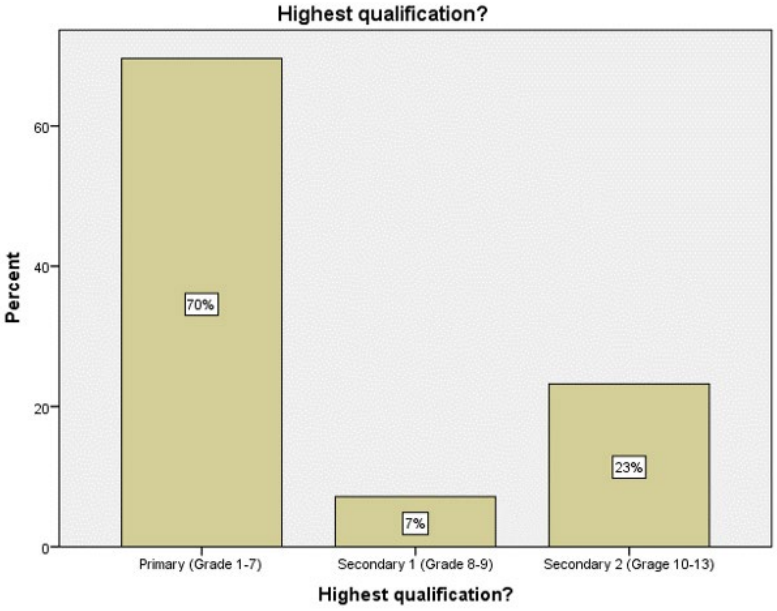

Figure 4-10: Highest qualification for Mozambican survey respondents

Informal ways of knowledge transfer, such as word of mouth, learning by doing, socialisation, etc. become essential in places such as these, where formal schooling is no longer an option. A positive side to this type of informal learning is that people tend to have hands-on experience. However, this knowledge and experience is very context-specific, as people who are displaced from the areas where they have local and contextual knowledge and wisdom may struggle to adapt to new places. This has also been the case for displaced people in Chokwe. In Chokwe, farmers were used to water being readily available through a gravity-fed canal system. Their knowledge of farming was therefore based on a system where water is abundant. However, when they were displaced by the floods, people were given plots of land to cultivate in high-lying resettlement camps. These areas are significantly drier than the places they are used to, and as such, many of their endeavours in the new place failed. To illustrate, a respondent from Chiaquelane noted the following:

> *… the government, with the support of NGOs and the Catholic Church (CARITAS), built small houses to those who were poor and had lost everything. These houses had two bedrooms and one living room. Obviously, there is more demand than supply and priority was given to people with disabilities. They used grass and sticks to build their houses. Some declared that even in these conditions, they would not return to Chokwe. And really, that's what happened to the people from the 2000 floods. They did not return. After their confirmation of not returning, the leaders gave them fields for cultivation and then they started to cultivate and sow these fields. Since they were coming from lower-lying and wetter lands, they did not know how to deal with cashew nut trees. So, we taught them how to plant and care for cashew nut trees.*

Here one can see that new knowledge with regard to types of crop, as well as a different type of climate, has been necessary for these farmers to adapt and become more resilient in the place to which they have been resettled.

d. Innovation: The system creates an enabling environment to foster innovation, experimentation and the ability to explore niche solutions in order to take advantage of new opportunities

For many of the Mozambican respondents, flexibility has been a very important form of innovation. For some, a niche solution to the dual problem of flooding and safety has been to move constantly between flood-prone agricultural plots to higher-lying homesteads in the resettlement camp. The displaced persons from Chokwe, who were given plots in Chiaquelane, have been innovative in this way. Respondents explain it as follows:

> *They have their houses here and others in a risky zone. So, they have two houses. What makes them do it like this is because this is a very dry area, while in Chokwe they have wet lands.*
>
> *I don't know. Some say that in the valley they produce more as they have an irrigation scheme and I don't know what, and... I don't know. But, there are some who live with us here. Some go back and forth according to the season.*
>
> *Here it is difficult. What we have done to deal with the hot weather, is that we go to the wet lands (lowlands) and valleys. We sow vegetables, we use our heads to carry water and then we irrigate the soils. This is the way we manage to feed our families and do other things.*

The Mozambican respondents informed the research team that the government allowed them to hold title deeds to both properties: a title deed to the area that is safe from flooding (the resettlement area) and a title deed to the other place in the "risky zone", which is prone to flooding, but guarantees the economic survival of the family.

For many respondents, however, after the floods and the loss of their tangible assets, farming has no longer been an option. As such, they have been forced to innovate. Not many options are available as the country and its residents are poor, people rely on themselves to produce their own food and cash is not readily available. Specifically, the lack of opportunities in resettlement camps has forced people to become more entrepreneurial, either by trying to find jobs or starting an informal business to sell goods. For example, a respondent explains:

> *Eish...they survive, as it is not raining…when it rains, we have cassava, some peanuts and vegetables. But, for a while…hum it is chaotic. Life is getting chaotic. They are surviving individually. They work in the fields of others. They do odd jobs in order to find something to feed their family members. But not everyone has the same luck. But they are still working in the fields, hoping that one day it will rain. It is difficult. But we are not stopping to cultivate. We are cleaning the fields.*

The above quote also illustrates the ability of people to diversify their income streams, thus increasing their adaptive capacity should one of their income streams cease to work.

e. Flexible, forward-looking decision making and governance: The system is able to anticipate, incorporate and respond to changes with regard to its governance structures and future planning

When a person is poor and has suffered significant loss due to catastrophic environmental events such as the floods of 2000 and 2013 in Mozambique, it is very difficult to plan for the future. Day-to-day living becomes the norm, and the future is something that people do not even consider. All they are aware of is the current need for food or shelter. Many of the respondents in the Mozambican case study reported this. However, a strong adaptive capacity and resilience require future planning.

In the case study in Mozambique, the team often encountered respondents who seem to wait for government or donor agencies to secure their survival in the form of aid, resettlement or new infrastructure. However, it was seen that, in Mozambique, this has not translated into secure livelihoods. There are some respondents who take up the challenge themselves and who argue that it is up to them to survive, and that they seek to do so by devising some sort of future plan. For example:

> *In circumstances of lack of rain, we don't wait for anybody. We look to survive. I cannot die because I am waiting for a response or guidance from someone. I have to go out looking for a job from a brother. That brother can pay me a little that I can use to buy food for my children.*

4.3 THE IMPACT OF ENVIRONMENTAL MIGRATION ON THE CASE STUDY AREAS

Thirdly, we investigate the impact of environmental migration on the Limpopo and Gaza Province case study areas. For this analysis, reference is made to the schematic representation of Abel et al. (2019) of the interplay between climate, conflict and forced migration (see Figure 4-11) with a specific focus on the impact of migration on conflict over scarce resources, and demographic pressures in the destination area. The research team has chosen to focus on this particular aspect of the diagram as linkages between environmental factors that lead to tensions over scarce resources and migration were discussed in section 4.1.1. This figure is useful to the analysis as it not only highlights the role that environmental pressures can play in influencing the decision to migrate, but also focuses on the impacts of migration on the environment and other sectors in the destination area.

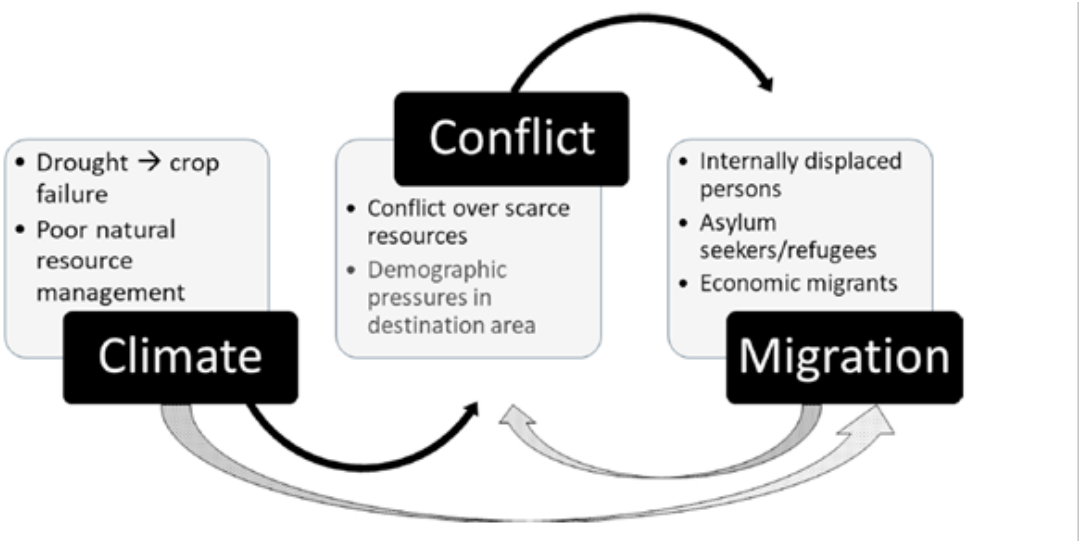

Figure 4-11: Conceptual model of climate, conflict and migration (Abel et al., 2019)

4.3.1 The impact of environmental migration on the Limpopo case study area

In discussing the impact of environmental migration on the Limpopo case study area, the research team predominantly made use of the interview data, as well as discussions with the provincial government of Polokwane and with the Disaster Management Advisory Forum of the Vhembe District Municipality. Where applicable, this data is supplemented with information from academic and other sources.

In the context of Limpopo, migration takes the form of migration into South Africa from neighbouring countries, migration within Limpopo from rural to urban areas in search of better opportunities, and migration out of Limpopo to South Africa's economic heartland of Gauteng. A number of the research respondents, and in this case mostly government officials from the case study area, stated that illegal, undocumented migration into South Africa and people moving into cities (rapid urbanisation) within Limpopo, but also elsewhere in South Africa, are putting considerable pressure on the government's ability to provide various services. With reference to the conceptual model of Abel et al. (2019), this assumption links to migration, resulting in demographic pressures in the destination area. The services mentioned by the research respondents include health, electricity, water and sanitation. In terms of healthcare, for instance, and as supported by the content of one of the focus group discussions, many migrants come to South Africa in part to benefit from free and good-quality healthcare, which is either absent or for which they need to pay in their countries of origin. This, according to local government respondents, puts considerable pressure on towns such as Musina, as hospitals and clinics plan for the population of the city to which they need to provide a free health service, and cannot also plan for an unspecified number of migrants coming from rural areas within South Africa and from other countries. According to Veary et al. (2017), contrary to popular assumptions, it is internal migration that presents greater governance, health system and health equity challenges than cross-border migration, and a coordinated, evidence-informed response is needed, which engages with health, migration and mobility. According to section 27 of the South African Constitution (RSA, 1996), everybody residing in South Africa has the right to free universal healthcare, regardless of their legal status.

Similar arguments can be made about migrants (both from other countries and from rural areas moving into urban areas), putting pressure on other services, such as housing, electricity, waste management, water and sanitation in South Africa's urban areas, because the existing infrastructure was not designed to cope with a large influx of people. This is particularly the case for people who settle in peri-urban areas on the outskirts of cities and towns, and the difficulty of incorporating such informal settlements into urban planning.

Linked to the issue of inadequate water and sanitation infrastructure is the backlog in maintenance and the upgrading of such infrastructure, which puts it at risk for failure. Particular problems include the security of water supply in areas other than major urban settlements, loss of water due to leaks and malfunctioning wastewater treatment plants (SAICE, 2017).

Several of the respondents from government also mentioned an assumed link between international migrants and crime, particularly as their lack of documentation renders them invisible and therefore exempt from the laws of South Africa. This mirrors other statements by the media and politicians that international migrants are responsible for the country's high crime rate (Faccini et al., 2011). However, Kollamparambil (2017), in a statistical analysis of the involvement of international migrants in urban area crime, concluded that migrants from other countries do not contribute significantly to South Africa's high crime rate. His study concluded that crime (other than sex-related crime) was higher in municipalities characterised by higher levels of inequality and a higher internal migrant ratio.

Relatedly, an interesting point can be made regarding cross-border traders bringing goods in and out of South Africa. Whereas many of them would be willing to pay tariffs, they seldom have the know-how to access preferential tariffs for the SADC region, or officials charge them incorrect, higher tariffs in order to make a profit. Traders therefore often resort to paying bribes to officials in order to pass their goods across the border, which these officials are happy to accept (Peberdy, 2002). Corruption, as a problem when it comes to immigration-related matters, was repeatedly mentioned by the respondents during the course of the research.

A major problem regarding the assessment of the impact of environmental migration on the Limpopo case study area is the lack of reliable data on how many international migrants live in South Africa. Statistics South Africa (Stats SA) estimated the number of foreign-born nationals living in South Africa to be 2.2 million in 2011 (Stats SA, 2011), while the United Nations estimated the number to be 3.14 million in 2015 (UN, 2014), and more recently 4 million (Business Insider, 2017). Other sources, noticeably the media, have put the number to be much higher (e.g. Carte Blanche, cited in Africa Check, 2017). This uncertainty causes considerable confusion about the number of international migrants residing in South Africa, but also makes it impossible to ascertain their actual impact on urban areas and related services, and also to plan for and address such impacts. Furthermore, such uncertainty fuels dangerous rumours and, in turn, results in the aggravation of xenophobic sentiments, as witnessed in the recent renewed outbreaks of xenophobia across South Africa (e.g. Fabricius, 2019; Opara, 2019). Interestingly, according to the research, xenophobia is less of an issue in Musina, as illustrated by the following quote: *"We don't have any of that because in one way or another we are all migrants."* This ties in with Musina's location as a transit zone with constant migration taking place into and out of South Africa.

Here, of course, it is also important to reflect on the positive impacts of international migrants on South Africa as a whole, and the Limpopo case study area in particular. A 2018 report by the Organisation for Economic Cooperation and Development (OECD) and the International Labour Organisation (ILO) on the contribution of international migrants on the South African economy states that international migrants are well integrated into the South African labour market, and, in general, do not seem to displace native-born workers. This differs somewhat at the subnational level, which could potentially also apply to the Limpopo case study area, where the presence of migrant workers has both negative effects (lower employment rates) and positive effects (higher incomes) for the native-born population. Regarding their contribution to the gross domestic product (GDP), the report estimates that migrant workers may raise the South African income per capita by up to 5% due to their relatively high employment rate in South Africa, their higher average educational qualifications, and the relatively high share of international migrants workers who are of working age. When one looks at border areas, informal cross-border trade contributes to economic development, poverty alleviation, the organisation of regional markets and regional integration (Peberdy, 2002).

Finally, international migrants also make a positive contribution to the South African economy as they tend to pay more in income tax and value-added tax. While these positive impacts relate mostly to documented legal international migrants, there is certainly scope to better integrate undocumented migrants who, according to the interviews, are willing to do work that South Africans do not want to do, into the country's legal systems and processes.

4.3.2 The impact of environmental migration on the Gaza Province case study area

The impact of the environmentally forced migration of 2000 and 2013 on the Chiaquelane and Chinhacanine resettlement camps seems to have been limited. From the interviews with the residents of the two resettlement areas, those who were resettled there were generally welcomed and accepted without too many problems. This can be attributed to the process of resettlement having been an organised, government-led initiative.

Some more negative impacts for the environmentally forced migrants in Chinhacanine included not having been allocated land to farm, but still having to do their farming remotely. For both resettlement camps, the conditions for agriculture in the higher lying areas were much less suitable than in the areas that they had left behind. As discussed earlier, this also resulted in a relatively high number of migrants from Chiaquelane returning to the lower lying areas close to Chokwe town once it was safe to do so.

Some resentment is felt by residents of Chiaquelane who said that those who had come because of the floods in 2000 were able to return home to Chokwe permanently to make a living on their agricultural lands close to Chokwe, or to have a second home in Chokwe while also keeping their house in Chiaquelane. Resentment is also felt because some land was taken from the people living in Chiaquelane and redistributed to the resettled people from Chokwe. This is in contrast to people who were already living in Chiaquelane prior to the floods, and only have a house there. The frustration felt is expressed in the quotes below:

> *However, some were given land that we (the people already living in Chiaquelane) used to cultivate, where we cultivated peanuts (groundnuts), cassava and fruit trees. Now we are feeling the pain, because they did not even stay here. They returned to Chokwe where they have houses or residences. We are no longer authorised to use that land, because we have been told that that land belongs to the people who came because of the floods. We suffered like them during the floods of 2000. The displaced people of the 2000 floods did not stay here because of hunger. Here we lack everything because of drought. Cassava does not cook and it does not matter how long it is on the stove. This is how we live nowadays. Alternatively, we use the leaves of sweet potatoes. We are like them. When it rains, they return to their resettlement area. Unlike us, who have to live in a dry area, the people of Chokwe cannot cope with living here. They plant rice, vegetables, beans, sweet potato and some maize in Chokwe, while we plant cassava, peanuts, some beans, cashew nuts, mangoes, etc. here in Chiaquelane.*

> *Did you hear me when I said they took our field (in Chiaquelane). They took our trees, everything we had. We did not get any compensation. The people who came because of the floods are not even grateful to us, considering that they made us suffer and took our things. They don't demonstrate gratitude.*

Regarding more positive impacts, in several of the interviews, the residents from Chinhacanine stated that the migrants who had been resettled there brought development with them. As a result of the resettlement, the Mozambican government and aid agencies invested considerably in the upliftment of Chinhacanine, for instance, through the provision of water supply services and the building of a secondary school. These positive impacts are illustrated by the following quotes:

No. We were not rejected due to xenophobia. There was a consensus from the people of Chinhancanine. They gave us their land freely. As a matter of fact, we were responsible for cleaning the area (full of bushes). Previously, this area was full of snakes and scorpions.

They did not hate us and neither did we hate them. They like us. They are happy because it was because of us that this place knows development. In the past, they did not have water from taps or electricity. We developed this area. They are proud of us.

CHAPTER 5: INITIATIVES TO PROMOTE AWARENESS-RAISING ON THE TOPIC OF ENVIRONMENTAL MIGRATION IN SOUTHERN AFRICA

During the course of the project, the research team engaged in several awareness-raising initiatives to promote the topic of environmental migration in Southern Africa. The first of these was a national dialogue, which was held at the CSIR Knowledge Commons on 20 June 2017. The aim of this dialogue was to introduce the combined CSIR and WRC climate-induced migration research programme to a broader community of practice, and to identify pertinent research questions and focus areas based on practical experiences from practitioners and policy makers working in the field. The discussion, furthermore, aimed to create partnerships to ensure the continued relevance and impact of future research findings. The dialogue furthermore provided an opportunity to launch the research programme, and provided the starting point for a follow-up dialogue, which was to be held in 2018.

The dialogue proved to be very successful, and also received considerable media coverage from the following sites:

- The Water Wheel (https://www.gate5.co.za/read/65524/qv/50311959/140237478/113018/p)
- Bizcommunity (http://www.bizcommunity.com/Article/196/356/163729.html)
- The Saturday Star (https://www.gate5.co.za/read/65524/qv/49995100/140136070/113037/p)
- Saturday Weekend Argus (https://www.gate5.co.za/read/65524/qv/49995435/140136196/113037/p)

A second dialogue at the SADC regional level was held on 5-6 June 2018. The CSIR co-hosted this successful SADC government regional forum meeting together with the IOM on the topic of Migration, Environment and Climate Change (MECC). The workshop was attended by MECC-related government representatives from all the SADC member states (except Zimbabwe) and the Indian Ocean Commission states. The WRC research project on environmental migration was well represented at the workshop. Inga Jacobs-Mata delivered a presentation on the CSIR's research programme on environmental migration, while Nikki Funke delivered a presentation on the complexities of the national policy landscape in South Africa as it pertains to environmental migration (the findings of Year 1 of the research). Both presentations were well received. Numerous areas of potential research were also flagged during the meeting, and the project team took careful note of these and has had a follow-up meeting with the IOM to establish where and how some of these areas of research could be pursued in future.

A further awareness-raising initiative took the form of one of the deliverables for this project: a documentary titled *Kukimbia: The impact of environmental refugees in Southern Africa*. The documentary introduced the topic and the reason behind the research, provided some information and context on the two main study sites that were visited, reflected on the plight of displaced people, and summarised some of the findings of the project. Being approximately 24 minutes in duration, the documentary did not attempt to be comprehensive; instead, it provides an overview of some aspects of the project and does so in an emotional manner. Where research reports speak to the mind, the idea behind this audio-visual product was to speak to the heart and create a sense of sympathy with the viewer.

The documentary was filmed in July and August 2019 and editing took place in September and October 2019. Footage of participants was only taken after consent was obtained (verbal or written), and permission to capture footage was granted from the managers of refugee shelters and municipalities, and the chiefs of rural villages.

The following hardware was used during video recording: Canon EOS M50 mirrorless camera, Canon EOS 800D DSLR, Yuneec Typhoon H drone, Rhode Video Micro microphone, Zhiyun Weebill Lab gimbal-stabiliser, Canon EF 50mm F1.8, Canon EF-M 15-45mm F3.5-6.3, Sigma 18-35mm F1.8 Art Series.

Raw video footage was edited using Filmora version 9.1 or newer (produced by Wondershare).

Video recording was done at a resolution of 1,080 p (1,920 × 1,080 pixels, full high definition), except for the drone footage, which was captured at a higher resolution of 2.7 K (2,704 x 1,520 pixels). South Africa uses the PAL broadcasting system, which prefers 25, 50 or 100 frames per second (fps) video footage. As such, the video material for this documentary was recorded in 25 or 50 fps. The final video was exported in MP4 format with a resolution of 1,080 p (full HD) and a frame rate of 25 fps.

The documentary has the potential to reach a wide audience and to spread constructive, research-based information about the plight of environmentally displaced persons and environmental migrants.

In order to ensure that the policy guidelines were informed by the views of one of their target audiences, decision makers at the Limpopo provincial and Vhembe district government levels, the CSIR team undertook a trip to Limpopo from 9 to 13 September 2019. During this trip, the team hosted two co-production workshops. The first workshop was held with officials from the Limpopo Provincial Government on 9 September 2019, and the second workshop was held with members of the Vhembe District Disaster Management Advisory Forum on 12 September 2019. During the workshops, Nikki Funke presented the aims, objectives and key findings of the project, and detailed a number of policy options identified in international best practice literature. The workshop participants were subsequently asked to discuss the feasibility of implementing these policy options in the context of Limpopo, and South Africa more broadly. The discussions took place in groups, and, at the end of the day, the groups gave feedback in plenary sessions. The outputs of the workshops form a key component of the South African policy guidelines that were developed as part of this project.

Finally, in addition to the fieldwork undertaken, the CSIR project team also engaged with staff from the following organisations and government entities during its fieldwork visits to talk to them about the project: the IOM’s Musina office, De Beers Venetia Diamond Mine, the Musina Women’s Shelter, Weipe Irrigation Board, Mopane Bush Lodge, Musina Legal Advice Office, Lawyers for Human Rights, the UNHCR Field Office in Musina, the Beitbridge Department of Home Affairs Office, Christian Women’s Ministries Boys Shelter, the Disaster Services Unit at Vhembe District Municipality, the Environmental Health Office at Vhembe District Municipality, the Vhembe District Disaster Management Advisory Forum, the Thohoyandou Office of the Department of Health (primary healthcare), the national Department of Social Development and the Department of Rural Development and Land Reform (Spatial Planning and Land Use).

CHAPTER 6: SUMMARY OF FINDINGS

This research has responded to the current dearth of information on the migration environment and climate change nexus in southern Africa by aiming to investigate the impact of environmental displacement and migration in Limpopo, South Africa, and the Gaza Province, Mozambique.

These are the key findings:

- In line with the views of other authors, it is confirmed that it is very difficult to study migration linked to slow-onset events due to the multiplicity and complexity of factors influencing migration in such cases. On the basis of the Limpopo case study, it was found that, in most cases, it is impossible to attribute cross-border migration into South Africa exclusively to environmental reasons. Nonetheless, the research team reiterates the importance of studying such cases, even if they cannot be classified as "pure" environmental migration. This is because of the increasing prominence of environmental stressors on people's livelihoods linked to climate change, and particularly in countries that are also characterised by political instability and severely limited economic opportunities. This research project has been a start in doing research in this direction, particularly in the southern African context, but considerably more remains to be done.

- The research team found that a major problem regarding the impact of migration in general, and environmental migration, in particular, on the Limpopo case study area was the lack of reliable data on how many international migrants live in South Africa. Statistics South Africa estimated the number of foreign-born nationals living in South Africa to be 2.2 million in 2011, while the United Nations estimated the number to be 3.14 million in 2015 and 4 million in 2017. Other sources, noticeably the media, have put the number to be much higher. This uncertainty causes considerable confusion about the number of international migrants residing in South Africa, but also makes it impossible to ascertain their actual impact on urban areas and related services, as well as to plan for and address such impacts. Furthermore, such uncertainty fuels dangerous rumours and, in turn, results in the aggravation of xenophobic sentiments, as witnessed in the recent renewed outbreaks of xenophobia across South Africa. The research team therefore argues for the need for considerably more rigorous and robust research to try to determine migrants' impacts – both positive and negative – on the South African economy and other services and systems within the country.

- Given that labour migration into South Africa is an age-old phenomenon, and given the continued attraction of South Africa as a destination by people from other African countries, a securitised "keep out" policy is likely to only have limited success. The government's intentions to document and regularise migrants already in South Africa is probably a step in the right direction, and can be supported by various initiatives, such as strengthening and improving upon existing formalised labour exchange programmes outside the normal general work permit procedures. An example is the current Zimbabwean Exemption Permit, which legalises Zimbabweans living, working and studying in South Africa. Here, and this relates to the previous point, it is also important to look at the positive aspects of migration (even of low- and medium-skilled migrants), who often come into South Africa with an entrepreneurial spirit and willingness and eagerness to work, which opens up opportunities to contribute to the South African economy. At the same time, given the undisputed social, economic and political burden of hosting substantial numbers of foreign nationals, embracing migrants is not something the South African government should have to do on its own. Here, and in accordance with regional and global frameworks that address the issue of migration and environmental migration, the government should try to look outside its borders for bilateral, regional and third-country or donor support to help shoulder the responsibility of hosting foreign nationals who have moved for environmental and other reasons.

- A prominent finding in the Mozambican case study has been the adaptive capacity of people that were resettled to drought-prone, high-lying areas, and now commute between their fertile original lands and these areas to try to continue to make a living off the land. While the Mozambican government has expressed concern about people returning to their areas of origin, it should perhaps try to embrace such movements and develop ways of enabling people to benefit from both their areas of origin and the safe havens to which they have been resettled, for example, through secure tenure to both parcels of land. An alternative may be to develop the resettlement areas more by providing more economic opportunities, amenities and services, and to make them more attractive to stay in. This could be done by further building on the infrastructural development that has taken place in Chinhacanine. Introducing additional infrastructure can also take the form of adaptive infrastructure, whereby below-the-ground flood water is captured to reduce the impact of flooding, and which can be extracted during drier periods, and to recharge ground water reserves (Petja, 2017), or through the construction of drainage ditches to accommodate flood flows (Twumasi et al., 2017).

CHAPTER 7: CONCLUSION

In this project, the research team contributed to addressing the dearth in empirical data on environmental migration in southern Africa by providing rich and detailed theory-based case study analyses of two southern African case studies, as well as covering migration linked to slow-onset and rapid-onset environmental factors. The analyses therefore make a valuable contribution to existing literature on the topic of environmental migration.

Based on the case study analysis and the contributions of international expertise on the topic of environmental migration, the research team has developed six guidelines to help policy makers better understand the concept of environmental migration within their particular context (SADC, South Africa and Mozambique). The team furthermore set out a number of context-specific policy recommendations to enable decision makers to better respond to the challenges of environmental migration.

Based on this study, a number of areas for further investigation have been identified:

There is a need to further disentangle the complexity of studying migration influenced by slow-onset events. Because of its “creeping” nature, the effects of drought occur slowly over an extended period. As a result, the onset and the end of drought are difficult to determine, making it even more challenging for scientists and policy makers to agree “on the basis of declaring an end to drought” (Wilhite et al., 2014). Similarly, as a result of its protracted nature, it is often difficult to determine related migration or mobility patterns, as there is no sudden displacement of a critical mass of people. It is also one of the most difficult to predict because of the types of migration (seasonal, return, repeat, permanent and temporary), the multi-causality of intervening variables (socio-economic status and migrant selectivity) and the complexity of environmental outcomes (deforestation and fisheries depletion) (Curran, 2002).

Environmental factors will always be one of several that contribute to the decision to migrate in the case of slow-onset events, and they may not be the main reason behind somebody’s decision to migrate. Nonetheless, even if environmental factors only constitute a contributing reason for migration, this does not justify ignoring their influence (Warner et al., 2009). This is especially the case because climate change, and in particular drought, is predicted to exert a growing and progressively severe influence on the southern African region (Mambo and Faccer, 2017). This research project has provided some insights into the influence of environmental factors on people’s decisions to migrate, but considerably more needs to be done in this regard, also linked to considerations of households’ adaptive capacity and resilience.

More research is needed on cross-border environmental migration and displacements. While the number of internal displacements within the borders of countries as a result of environmental factors is well documented, noticeably by the IDMC (2020), very little data and analysis exist about cross-border displacements and migration as a result of environmental factors (Mcauliffe and Klein Solomon, 2017). An additional factor that complicates the study of cross-border displacements is irregular and undocumented migration. Given that southern Africa has a history of cross-border labour migration, and given the dire economic and political conditions in some of South Africa’s neighbouring countries (e.g. Zimbabwe and Mozambique), cross-border migration is an important topic in the context of the southern African region.

Remittances turned out to be a topic of great importance in the research in terms of strengthening the adaptive capacity of individuals and households who had moved away from their places of origin. With a particular focus on environmental migration, it is important to establish how remittances are used in communities of origin to offset the negative impacts of droughts and flooding. Examples include drilling boreholes to access water for irrigation during droughts, reinforcing housing infrastructure to better withstand flooding, or buying food to sustain livestock during dry periods.

A research topic of arguably national importance to South Africa is to develop an accurate picture of the real impacts (both positive and negative) of international migrants on the infrastructure and services of the places to which they relocate. A better understanding of these impacts is crucial to being better able to manage them, but also to avert emotional reactions to the perceived negative influences of international migrants, which have contributed considerably to several spates of xenophobic attacks in South Africa.

CHAPTER 8: PUBLICATIONS AND PRESENTATIONS

The project yielded the following peer-reviewed publication:

JACOBS-MATA I, FUNKE N and NOHAYI N (2019) Managing human mobility and climate change in river basins. In: *Sustainable Management of River Basins,* ARLINDO P and DO CARMO SOBRAL M, Manole Publishers, Brazil.

Two dialogue proceedings were produced for each of the dialogues that were held:

FUNKE N (2018) National dialogue: Taking stock of the impact of environmental refugees and climate-induced migration in Southern Africa, 20 June 2017, Pretoria, South Africa. Water Research Commission, Pretoria, South Africa.

HERRERO I, FUNKE N and NOHAYI N (2018) Migration, environment and climate change: Regional policy forum for Southern Africa and the Indian Ocean Region, 5–6 June 2018, Pretoria, South Africa. Water Research Commission, Pretoria, South Africa.

The project team gave numerous presentations at different forums throughout the duration of the project:

1. A regional perspective on the environment-climate change-migration nexus: How can science inform governance and policy responses?, UNESCO-IHP Symposium, March 2017, Pretoria, South Africa.

2. A regional perspective on the environment-climate change-migration nexus: How can science inform governance and policy responses?, WRC Environmental Refugee Dialogue, 20 June 2017, Pretoria, South Africa.

3. A regional perspective on the environment-climate change-migration nexus: Governance and policy responses to environmental refugees, IWA WRBM Specialist Conference, 9–11 October 2017, Skukuza, South Africa.

4. A regional perspective on the environment-climate change-migration nexus: How can science inform governance and policy responses? IOM Capacity Building Workshop on Environmental Migration, 22 August 2017, Pretoria, South Africa.

5. Regional Policy Forum for Southern Africa and the Indian Ocean Region, 5–6 June 2018, Pretoria, South Africa.

    a. Presentation 1: An R&D perspective on the environment-climate change-migration nexus in Southern Africa

    b. Presentation 2: Cross-border and internal environmental migration in South Africa: deciphering the complexities of the changing policy landscape

6. The impact of environmental migration in South Africa. Policy considerations for Limpopo Province, Co-production workshops with Limpopo Provincial Government, 10 September 2019, Polokwane, South Africa and the Vhembe District Advisory Forum 12 September 2019, Thohoyandou, South Africa.

CHAPTER 9: CAPACITY BUILDING

All four students that were mentioned in the proposal for this project have been appointed.

Name	Student number	Youth	Gender	Race	Qualification registered for and university	PDI	Citizenship
Elliot Moyo	18382186	No	Male	African	PhD – Political Science (University of Pretoria)	Yes	South African
Nora Hanke-Louw	19347392	Yes	Female	White	PhD – Political Science (University of Pretoria)	No	German (South African permanent residence)
Ngowenani Nohayi	216057491	Yes	Female	African	Master's – Development Studies (University of Johannesburg)	Yes	South African
Lynn Madziwanzira	Not available yet	Yes	Female	African	Master's – International Relations (University of Pretoria)	No	Zimbabwean

Lynn Madziwanzira was accepted for a master's degree in International Relations in February 2020.

Degree	2017/18	2018/19	2019/20
PhD (Elliot Moyo)	X	X	X
Master's (Nina Nohayi)		X	X
PhD (Hanke-Louw)		X	X
Master's (Madziwanzira)		X	X

In terms of progress, Elliot Moyo's PhD proposal, titled "Climate variability and migration in Musina: An assessment of trends, flows and practices", was accepted in the second half of 2019/20 and he was awarded ethical clearance. He is currently conducting the fieldwork for his study. Nina Nohayi planned to submit her master's dissertation for marking in February 2020. Her dissertation is titled "Refugeeship as an adaptation to a changing environment: Young asylum seekers in Musina". Nora Hanke-Louw and Lynn Madziwanzira are in the process of finalising their proposals.

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APPENDIX 1 – CLIMATE-INDUCED MIGRATION AND ENVIRONMENTAL REFUGEES SURVEY

CLIMATE-INDUCED MIGRATION AND ENVIRONMENTAL REFUGEES SURVEY		
D1. Questionnaire number	D2. Date of data entry	D3. Name of data entry officer

A. IDENTIFICATION OF THE VILLAGE	
A1. Region	
A2. District	
A3. Municipality	
A4. Village name	

B. IDENTIFICATION MARKERS FOR INTERVIEWEE			
B1. GPS: Latitude		B2. GPS: Longitude	
B3. Full name of interviewee (if permission is granted by interviewee)			
B4. Telephone of interviewee (if permission is granted by interviewee			
Migrant or non-migrant			

C. IDENTIFICATION OF ENUMERATOR

C1. Name of interviewer	

C2. Number of visit	C3. Date			C4. Result	C5. Time begin	C6. Time end	Results code
	DD	MM	YYYY				1. Complete
1							2. Partial
2							3. Refused
3							4. No one currently / temporarily absent
							5. Uninhabited house

E. SOCIO-ECONOMIC PROFILE OF THE HOUSEHOLD

List of all present and absent members that contribute to/ rely upon the resources of the household (including children)

ID	E1. Name of all members that contribute to/rely upon the resources of the household (Start the list from the household head (HH))	E2. Relationship to HH		E3. Place of birth	E4. Age	E5. Sex	E6. Currently employed	E7. Currently attending school	E8. Years of education	E9. Current location for most of the year
		1 HH	8 Niece/ nephew	1. In this village / town 2. Elsewhere in the region 3. Elsewhere in the country 4. Abroad 99. Don't know 00.Refused to answer		1. Male 2. Female	1. Yes (permanent) 2. Yes (temporary) 3. No 99. Don't know 00. Refused to answer	1. Yes 2. No 99. Don't know 00. Refused to answer		1.This village or district 2.Elsewhere in the district (specify municipality) 3.Elsewhere in the country (specify municipality) 4. Abroad (specify country) 99. Don't know 00. Refused to answer
		2 Husband/ wife	9 Children in law							
		3 Son/ daughter	10 Parent in law							
		4 Father/ mother	11Grandpa/ Grandma							
		5 Brother/ sister	12 Other (specify)							
		6 Uncle/ aunt	99 Don't know							
		7 Cousin	00 Refused to answer							

	Name	Code	Specify	Code	Years	Code	Code	Code	Years	Code
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

E. NATURAL DISASTERS AND HOW THEY AFFECTED THE SOCIO-ECONOMIC PROFILE OF THE HOUSEHOLD	
E10. In the last ten years, has your place of origin (the place you come from) (USE ACTUAL NAME) been affected by? Read and answer all the options with: 1. Yes, several times / 2. Yes, once / 3. No	
a. Drought / irregular rains	
b. Landslides	
c. Wildfires	
d. Volcanic eruption	
e. Floods	
f. Cyclone / hurricane	
g. Storm surge	
h. Riverbank erosion	
i. Earthquake	
j. Other (specify)	
E11. Among these, was there a single climatic/environmental event that affected your livelihood more than any other? 1 Yes – specify number from table above; 2 No (go to E.14); 99 Don't know	
E12. In which year did this occur?	
E13. Did your household receive a warning before it happened? 1 Yes, with enough time to act 2 Yes, without enough time to act 3 No 99 Don't know	
READ IMPORTANT MESSAGE: If the respondent answers yes to question (E11), "before" in the following questions should be read as "before the event…"; if no, before should be read "10 years ago" now = past year, before = year before event or 10 years ago	
E14. Now, what is the main source of income for your household? If the answer is "other" specify here:	
E15. 10 years ago, what was the main source of income for your household? If the answer is "other" specify here:	
E16. Now, besides the activity you just mentioned, does your household have other sources of income? If the answer is "other" specify here:	
MULTIPLE ANSWERS POSSIBLE	
E17. 10 years ago, besides the activity you just mentioned, did your household have other sources of income? If the answer is "other" specify here: 1 Employed — 6 Remittances (people in country) 2 Small enterprises — 7 Remittances (people abroad) 3 Street sales — 8 Agriculture (farmer) 4 Savings — 9 Agriculture (farm labourer) 5 Real estate — 10 Other, specify above 99 Don't know — 00 Refused to answer	

E18. Now, does your household own a house and/or land?	
E19. 10 years ago, did your household own a house and/or land? 1 House 2 Land 3 House and land 4 Neither house nor land 99 Don't know 00 Refused to answer	
E20. Now, which of the following items does your household have?	
E21. 10 years ago, which of the following items did your household have? 1 Television 7 Motorised two-wheelers (scooters/bikes) 2 Mobile phone 8 Motorised four wheelers (cars, jeeps, buses) 3 Radio/transistor 9 Non-motorised vehicles (carts, bicycles etc) 4 Computer/laptop 10 Boat 5 Stove/wood burner 11 None of them 6 Sewing machines 99 Don't know 00 Refused to answer	
E22. Now, does your household have one or more chronically sick or permanently injured member?	
E23. 10 years ago, did your household have one or more chronically sick or permanently injured member?	
E24. Now, does your household have access to good quality healthcare?	
E25. 10 years ago, did your household have access to good quality healthcare?	
E26. Now, does your household have access to clean and safe drinking water at least once a week?	
E27. 10 years ago, did your household have access to clean and safe drinking water at least once a week?	
E28. In the last year, has there always been enough food to feed all household members with three meals a day?	
E29. 10 years ago, was there always enough food to feed all household members with three meals a day?	
E30. Now, does your household have access to electricity every day?	
E31. 10 years ago, did your household have access to electricity every day?	
E32. In the last year, did your household face any safety and security problem?	
E33. 10 years ago, did your household face any security problem?	
E34. In the last year, would you say that your household has suffered from discrimination/exclusion in employment, health or education?	
E35. 10 years ago, would you say that your household suffered from discrimination/exclusion in employment, health or education? 1 Yes 2 No 99 Don't know 00 Refused to answer	
E36. Now, if your household needs help, who can you revert to for help? If the answer is "other" specify here: 1 Family 5 Church / religious organisation 2 Friends 6 Other (specify above) 3 Neighbours 7 Nobody 4 Other community members 99 Don't know 00 Refused to answer	

E37. 10 years ago, if your household needed help, who could you revert to for help? If the answer is "other" specify here: 1 Family 5 Church / religious organisation 2 Friends 6 Other (specify above) 3 Neighbours 7 Nobody 4 Other community members 99 Don't know 00 Refused to answer	
E38. Now, is anybody in your household a part/member of one or more of the following organisations? If the answer is "other" specify here: 1 Water/waste or fishermen's group 9 School/health committee 2 Agricultural cooperative 10 Labour union 3 Trader's association/business group 11 Village/town council 4 Credit or savings association 12 Humanitarian or charitable organisation 5 Religious group/organisation 13 Other. Specify above. 6 Political party/group 14 We don't participate in any organisation 7 Sport, recreational, art, music group 99 Don't know 8 Women's group/youth group 00 Refused to answer	
CHECK ALL OPTIONS CORRESPONDINGLY	
E39. 10 years ago, was anyone in your household a member of one or more of the following organisations? If the answer is "other" specify here: 1 Water/waste or fishermen's group 9 School/health committee 2 Agricultural cooperative 10 Labour union 3 Trader's association/business group 11 Village/town council 4 Credit or savings association 12 Humanitarian or charitable organisation 5 Religious group/organisation 13 Other. Specify above. 6 Political party/group 14 We don't participate in any organisation 7 Sport, recreational, art, music group 99 Don't know 8 Women's group/youth group 00 Refused to answer	
E40 Now, how much is your household´s monthly income (on average?)	(local currency)
E41.10 years ago, how much was your household´s monthly income (on average?) 99 Don't know 00 Refused to answer	(local currency)
E42. Now, does your household make use of formal (banks/financial institutions etc.) credit? 1. Yes 2. No. 99 Don't know 00 Refused to answer	
E43. 10 years ago, did your household make use of formal (banks/financial institutions etc.) credit? 1. Yes 2. No. 99 Don't know 00 Refused to answer	
E44. Now, does your household make use of informal (friends/family/neighbours/ community associations or cooperatives, etc.) credit? 1. Yes 2. No. 99 Don't know 00 Refused to answer	
E45. 10 years ago, did your household make use of informal (friends/family/ neighbours/community associations or cooperatives, etc.) credit? 1 Yes; 2 No; 99 Don't know; 00 Refused to answer	
E46. Now, what is the financial situation of your household? 1 Savings; 2 No savings, no debts; 3 Debts; 99 Don't know; 00 Refused to answer	
E47. 10 years ago, what was the financial situation of your household? 1 Savings; 2 No savings, no debts; 3 Debts; 99 Don't know; 00 Refused to answer	

E48. In the last year, has your household taken any of these measures to prevent impacts of future hazards? 1 Relocated to a safer place 2 Used safer building materials 3 Constructed physical barriers around house/farm (e.g. dykes, walls) 4 Diversified economic activities 5 Sent household members outside the village to earn money 6 None 7 Other (specify): 99 Don't know 00 Refused to answer	
E49. 10 years ago, has your household taken any of these measures to prevent impacts of future hazards? 1 Relocated to a safer place 2 Used safer building materials 3 Constructed physical barriers around house/farm (e.g. dykes, walls) 4 Diversified economic activities 5 Sent household members outside the village to earn money 6 None 7 Other (specify): 99 Don't know 00 Refused to answer	
If answer in (E48) is "None" then answer question (E50), if not go to question (F1) If answer in (E49) is "None" then answer question (E51), if not go to question (F1)	
E50. In the last year, why did you not take any preventive measure? If the answer is "other" specify here: 1 There was nothing we could do 6 It's not our task 2 Lack of money 7 I don't know what I should have done 3 Lack of skills/knowledge 8 Other. Specify above. 4 Lack of other resources 99 Don't know 5 We had other priorities 00 Refused to answer	
E51. 10 years ago, why did you not take any preventive measure? If the answer is "other" specify here: 1 There was nothing we could do 6 It's not our task 2 Lack of money 7 I don't know what I should have done 3 Lack of skills/knowledge 8 Other. Specify above. 4 Lack of other resources 99 Don't know 5 We had other priorities 00 Refused to answer	

F. MIGRATION HISTORY OF THE HOUSEHOLD PERTAINING TO THE PLACE OF DESTINATION	
F1. For how many years has your household lived in this district (THE PLACE TO WHICH THEY HAVE MOVED / WHERE THEY ARE NOW?	
F2. Has any household member moved in/out of this district for at least three months in the last 10 years? 1 Yes ((Go to the table of migration in the following page); 2 No; 99 Don't know; 00 Refused to Answer	
F3. If no, why? 1 We decided to stay/never thought about moving 2 We had to stay 99 Don't know 00 Refused to answer	

(SEE TABLE OF MIGRATION IN THE FOLLOWING PAGE)	
F13. Have you received any support from the authorities to assist you with the (internal/international) migration process? 1 Yes, from local authorities 5 Yes, from international orgs 2 Yes, from the government 6 Other, specify 3 Yes, from NGOs/charities 7 None 4 Yes, from the Church/ religious authorities 99 Don't know 00 Refused to answer	
Please indicate if you agree or disagree with each of the sentences below 1 Agree 2 Disagree 3 Neither agree nor disagree 4 Don't know	
F14. I would like my family and friends to live here in the future (even after I die)	
F15. I miss this place when I am not here	
F16. I feel safe here.	
F17. I am proud of this place	
F18. I would like to move out of here	
F19. I don't have anywhere else to go to	
F20. I feel foreign here	

F. MIGRATION HISTORY OF THE HOUSEHOLD

Full migration history of each of the household members in the last 10 years.
NB: only include household members that have moved to the place of destination together

ID from Table 1	F4. Name of the (internal/international) migrant From the most recent to the oldest within a ten years range	F5. Internal/international movement 1. Internal 2. International (specify country)		F6. Final destination reached (municipality, region)	F7. Type of (internal/international) migration 1 Short-term movement (3 months to 1 yr) 2 Long-term/permanent movement (over a year) 3 Recurrent/seasonal movement (3 month to 1 year back and forth) 4 Disasters-related displacement, no choice than to flee 5 Relocation/assisted return decided by the government/authorities	F8. Date leaving previous residence	F9. Duration	F10. Prevailing remittance flows (financial or in kind)	F11. Who benefits from those remittances /goods?	F12. How frequently he/she sends/receives remittances?
						WRITE YEAR AND MONTH (mm/yyyy)	WRITE THE NUMBER OF MONTHS. If current location write 999	1 Received 2 Sent 3 None (F13) 99 Don't know (F13) 00 Refused to answer (F13)	1 Whole household 2 Several household members 3 One specific member (female) 4 One specific member (male) 99 Don't know	1 At least once a month 2 Each 1 to 3 months 3 Each 4 to 5 months 4 Each 6 months or more 5 Only for emergencies or on other special occasions 6 Never 99. Don't know 01. Refused to answer
	Name	**Code**	**Specify**	**Specify**	**Code**	**Date**	**Number**	**Code**	**Code**	**Code**
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										

G. IMPACTS OF MIGRATION	
G1. In the last ten years, how important was (internal/international) migration in changing/affecting your socio-economic status as a household? 1 Important in a positive way 2 Important in a negative way 3 Of little importance 4 Unimportant 99 Don't know 00 Refused to answer	
Please indicate the impact of (internal/international/both) migration in your household on the following issues: 1 Important in a positive way 2 Important in a negative way 3 Of little importance 4 Unimportant 99 Don't know 00 Refused to answer	
G2. Income	
G3. Employment level	
G4. Skills available in the household	
G5. Food availability	
G6. Safety	
G7. Trade opportunities	
G8. Family relationship	
G9. Health conditions	
G10. Education level	
G11. Investments	
G12. Credit availability	
G13. In the last year, how much money has this household sent in remittances?	(local currency)
G14. In the last year, how much money has this household received in remittances? If 0, go to G18.	(local currency)
G15. During the last 12 months, on which of the following items and services did your household spend the remittances? READ ALL THE OPTIONS. MULTIPLE ANSWERS POSSIBLE 1 Food 11 Consumer goods for personal use (clothes, shoes) 2 Housing 12 Luxury consumer goods (jewellery, cosmetics, watches) 3 Communication 13 Disaster relief, recovery, and preparedness 4 Transport 14 Bought insurance, bond or share 5 Agriculture 15 Repaid loans 6 Animal husbandry 16 Sponsored another migrant worker 7 Health care 17 Community activities (festivals, sports, infrastructure) 8 Education 18 Other (specify): 9 Savings 10 Business venture (started a new one or invested in an existing one)	
G18. What kind of skills or knowledge have the (internal/international) migrant (s) learned while away? "skill" MULTIPLE ANSWERS POSSIBLE 1 Electrical repair 15 Plumbing 2 Electronics repair 16 Drilling 3 Tailoring 17 Accounting 4 Welding 18 Knowledge of English language 5 Scaffolding 19 Knowledge of another language 6 Mason 20 Knowledge of new livestock types 7 Driving 21 Knowledge of computer 8 Cooking 22 New business ideas 9 Knowledge of new crop types 23 Auto repair 10 Knowledge of new crop varieties 24 Skills related to mining 11 Knowledge of improved cropping techniques 25 School 12 Carpentry 26 Other (specify): 13 Machine tools 27 None 14 Brickmaking	
G19, What kind of skills or knowledge did/does the (internal/international) migrant have the opportunity to use back in the household? "usage" MULTIPLE ANSWERS POSSIBLE (use skills list of G18)	

G20. What kind of skills or knowledge did/does the (internal/international) migrant have the opportunity to teach back in the household? “training” MULTIPLE ANSWERS POSSIBLE (use skills list of G18)	
G21. Has the (internal/international) migrant’s livelihood changed from what it was in his/her home?	
G22. What livelihood was practiced at home?	
G23. What livelihood is practiced now?	

Exit question: Please indicate if you are willing to participate in follow-up engagements with the research team, in the form of interviews or focus group discussions.

This survey is based on the the European Union-funded “Migration, Environment and Climate Change: Evidence for Policy” (MECLEP) project survey, conducted between January 2014 and March 2017.

APPENDIX 2 – INTERVIEW QUESTIONS

1) Interview questions:

Stakeholder group: Academia and research

Case study areas

Limpopo, South Africa	Gaza, Mozambique

No.	**Questions**
1.	How do you understand the concepts climate-induced 'refugee' and 'environmental migrant'? (Here you are interested in an academic/theoretical perspective coming from research)
2.	What research do you do on climate-induced refugees or migrants and why?
3.	What is the rationale for doing such research?
4.	What are the overall disciplinary and theoretical knowledge gaps in the research?
5.	What are researchers' (doing research on environmental migrants) political or ideological attitude towards this the topic?
6.	What is the South African populations' attitude towards accepting climate-induced migrants and refugees?
7.	What practicalities could institutions implement to assist these types of migrants or refugees?
Area-specific questions	
8.	Are there any climate-induced refugees or migrants in this area?
9.	Why are they moving?
10.	What do they do here (livelihood, for income, other activities)?
11.	What is the nature of government support for these migrants or refugees?
12	Do they have support from formal and informal networks?
13.	What practices do they follow to make a home at the new place?
14.	What are the important things they feel is necessary to their new place?
15.	How do they see themselves after moving?
16.	What are the ties that bind them to the place they moved from?
17.	How does the local community view them?
18.	What policies/programmes are in place to assist them?

Stakeholder group: National, provincial and local government

Case study areas

Limpopo, South Africa	Gaza, Mozambique

	National government
1.	Which national policies or legislation are you aware of that are applicable to regulate the movement and resettlement of people who have been displaced as a result of climate-induced events, i.e. environmental refugees?
2.	Are there different policies/legislation that apply for internal displacements as opposed to cross-border environmental migration? If so, please elaborate.
3.	What are the strengths of the existing policies/legislation to deal with environmental migration?
4.	What are the gaps in terms existing policies/ legislation that deals with environmental migration?
5.	How can these gaps be addressed?
6.	Which implementation challenges exist for existing policies/legislation that deal with environmental migration?
7.	How can these implementation challenges be addressed?
	Provincial and local government
1.	Are you aware of the presence of environmental refugees (people who have been displaced as a result of climate-induced events) in your province/municipal area?
2.	If so, what are your thoughts or feelings about the issue of absorbing environmental refugees into the local way of life and economy? What are the positive points and what are the challenges?
3.	How do you think the local population perceives/feels about the influx of environmental refugees?
4.	Is the influx of environmental refugees (people who have been displaced as a result of climate-induced events) something you include in your planning frameworks (e.g. integrated development plans)?
5.	If so, how? What are the strengths of your existing policies that address environmental migration?
6.	What are the gaps and implementation challenges and how can these be addressed?
7.	If you do not currently include environmental migration in your planning processes, is this something that you think should be part of your planning processes? How could this be included?

Stakeholder group: Environmental refugees and migrants

Case study areas

Limpopo, South Africa	Gaza, Mozambique

Questions about the environmental refugee/migrant's history	
1.	Where did you live before you moved here?
2.	Why did you move here?
3.	Which events or developments made you move here?
4.	Did you ever think of moving before but then decided to stay at home?
5.	Why did you decide to stay on those occasions but decide to move this time?
6.	With whom did you move? Did you leave someone behind? If so, why?
7.	Did you leave any responsibilities behind (e.g. do you have to support family at home)?
8.	What did you do for a living in the place you moved from?
9.	Have you ever gone back to the place you come from?
Questions about the environmental migrant's current life	
1.	What were the first things you did when you got here?
2.	What were your priorities?
3.	What are you doing for a living here now in the place to which you have moved? Has this changed over time e.g. from temporary farm labour to owning your own shop?
4.	Are you happy with what you are doing for a living or would like to do something else?
5.	If you would like to do something else, how would you make it happen?
6.	How well have you adapted to your new life? Are you happy here?
7.	What are the important things here that are helping you to cope (e.g. friends, family, church)?
8.	Do you think you have changed since you have moved here?
9.	Do you still practice your traditions, belief systems and socio-cultural practices? If so, name them? If not, why not?
10.	Are you able to openly practice your cultural traditions and use your mother tongue here without fear of being judged, discriminated against or harmed by others?
11.	Do you ever feel resented or threatened here?
12.	Do you get support from: • Government • NGOs • Religious groups (churches, etc.) • Family at home • Family here • Friends at home • Friends here
13.	Would you ever go back home permanently?
Questions about the environmental migrant's support networks	
1.	Which formal government institutions have been helping you to settle and cope here?
2.	How have they been doing so?
3.	What has been good about these processes?
4.	What have the problems been?
5.	How could these structures function better?
6.	Which non-government institutions have been helping you to settle and cope here?
7.	How have they been doing so?
8.	What has been good about what they have been doing?
9.	What have the problems been?
10.	What could they do better and how?

Questions about the environmental migrant's identity, socio-cultural practices and belief systems	
1.	What is your home language or mother tongue?
2.	Is your home language spoken (freely) in this area i.e. the place you have moved to? If no, how have you managed to mitigate the challenges?
3.	Have you learnt other languages to integrate in the new place?
4.	Are you affiliated to a local religious institution or a traditional-cultural network in the place to which you have moved? If yes, is it linked to a religious institution or traditional-cultural network back home?
5.	Has the affiliation helped you to integrate in the new place? If so, how?
6.	Are you able to follow your traditional practices in the place to which you have moved e.g. initiation, marriage ceremonies, cleansing?
7.	Are there any places such as river banks or mountain shrines and streams that you were attached to in your place of origin? Explain why they are important to you.
8.	Have you substituted these spiritual places of importance in the place to which you have moved e.g. found a new river bank or mountain shrine?
9.	What is your tribal/ethnic affiliation?
10.	How has your tribal/ethnic affiliation helped or hindered your integration in the place to which you have moved?
Questions about the environmental migrant's adaptation to climate change or climate variability	
1.	Have you noticed any changes in weather patterns in your place of origin (unpredictable rains, heavy rains, no rain, flooding, getting hotter/colder, cyclones etc.)?
2.	When/for how long have you observed these changes in weather patterns? When did it start?
3.	How have these changing weather patterns affected you and your family (livelihoods, changing socio-cultural patterns, spiritual practices, income etc)?
4.	Do you think you have managed/coped well with these changing weather patterns? If yes, how. If not, why not?
5.	Were there any environmental reasons that led you to leave your homeland?
6.	If these environmental reasons did not exist, would you still have left? How important was it in shaping your decision to leave?
7.	Have these changing weather patterns (climate change/environmental impacts) played a role in changing your cultural practices, belief systems?
8.	Have these changing weather patterns (climate change/environmental impacts) changed who you are i.e. your identity i.e. language, attitudes, behaviour?