Managing Displacement Amid Climate Extremes: Lessons from Cyclone Idai, Mozambique

Naomi Sunu

Migration & Food Security (MiFOOD)

Paper No. 49

Series Editors: Sujata Ramachandran and Jonathan Crush

Abstract

Tropical Cyclone Idai, which struck in March 2019, is one of the most catastrophic climate-related disasters in Southern Africa's history, particularly affecting Mozambique, Malawi, and Zimbabwe. Across these countries, the cyclone caused widespread economic, environmental, and infrastructural destruction, rapid displacements, and fatalities. Displaced people encountered disproportionate disaster impacts, underscoring the need to mitigate displacement risks as climate risks intensify. This paper examines the displacement impacts of Cyclone Idai in Mozambique, focusing on short-term, long-term, cross-border, and displacement management dynamics. The analysis draws on literature from peer-reviewed studies, humanitarian agencies, government reports, and policy documents. Findings show that displacements were largely internal post-Cyclone Idai, although some cross-border displacements occurred. Displacement management was challenged by weak disaster preparedness, reactive disaster response and resettlements, fragmented internal and cross-border disaster coordination, shaped by deep-seated structural and non-structural vulnerabilities. These challenges impeded disaster recovery and heightened future displacement risks. As climate risks rise, extreme weather disasters like Cyclone Idai will become more frequent, necessitating effective displacement management. This should be underpinned by improved early warning systems, disaster preparedness, coordination, and the mobilization of resources at national and regional levels. Sustainable solutions for climate-related displacements also require coherent national and regional policy frameworks on displacement that integrate disaster risk reduction into urban development, land-use planning, and climate-resilient livelihoods. The paper provides insights for building resilience against climate-related disaster impacts, particularly displacement in Mozambique and the Southern African region.

Keywords

Cyclone Idai, climate risks, vulnerability, displacement, disaster management, Mozambique

Suggested Citation

Sunu, N. (2025). Managing Displacement Amid Climate Extremes: Lessons from Cyclone Idai, Mozambique. MiFOOD Paper No. 49, Waterloo.

Author

Naomi Sunu, Balsillie School of International Affairs and Wilfrid Laurier University, Waterloo, Ontario, Canada: nsunu@balsillieschool.ca

Cover Image

Villagers impacted by Cyclone Idai waiting to receive food aid in Nhagau, Mozambique. Credit: US Air Force/Alamy

MiFOOD Network
GLOBAL MIGRATION & FOOD SECURITY

New Frontiers in Research Fund
Fonds Nouvelles frontières en recherche

Social Sciences and Humanities Research Council of Canada
Conseil de recherches en sciences humaines du Canada

Canada

This is the 49th Paper in the Working Paper Series published by the Migration and Food Security (MiFOOD) Network, an international network of researchers and organizations that focuses on the linkages between food security and international and internal migration in the Global South (www.mifood.org). The seven-year collaborative MiFOOD project is funded by a Partnership Grant from the Social Sciences and Humanities Research Council of Canada (SSHRC Grant No. 895-2021-1004). The research in this paper has been conducted for the Remitting for Resilience (R2): Enhancing Food Security and Climate Adaptation Through Gender-Inclusive Migrant Remittances Project funded by the Canadian New Frontiers in Research Fund (NFRF Grant No. NFRFI-2023-00324).

Published by the MiFOOD Network at the Balsillie School of International Affairs, Waterloo, Ontario, Canada

Introduction

The global disaster risk landscape is influenced by climate-related disasters, with disproportionate displacement impacts in regions of the Global South. Climate-related events have made up over 80% of all disasters since 2010. High surface temperatures in Africa have exceeded the global average, intensifying droughts, floods, and tropical cyclones, which lead to displacements (IFRC, 2020b; IPCC, 2022). Disaster displacement refers to the movement of people, whether forced or compelled, to leave their homes or usual places of residence because of a disaster, to avoid the effects of an immediate and predictable 'natural' hazard (IOM, 2021). Most disaster displacements occur within countries, and by 2023, there were about 35 million Internally Displaced Persons (IDPs) in Africa, accounting for roughly half of the global climate-related displaced population (IDMC, 2024b). Sometimes, combined disaster impacts surpass national borders and affect mobility across neighboring countries, as shown by Cyclone Idai (IPCC, 2022). In 2019, Tropical Cyclone Idai, accompanied by heavy rainfall, strong winds, and floods, mainly affected Mozambique, Zimbabwe, and Malawi. In these nations, around 2.98 million people were affected, over 111,000 houses were destroyed, and 240,000 were damaged. There were 1,300 deaths, over 600,000 displacements, and USD 2.2 billion in economic losses (Norton et al., 2020; UNHCR, 2019b).

Disaster risk hotspots, characterized by extreme vulnerability and significant adaptation challenges, are primarily located in Africa. Here, recurring climate-related hazards, dense populations, multidimensional poverty, and limited adaptive capacities increase displacement risks (World Risk Report, 2024). Vulnerability refers to the likelihood of experiencing severe disaster impacts, such as displacement, due to exposure, high sensitivity, and constrained adaptive capacities, all influenced by various physical, social, economic, cultural, and institutional factors (Birkmann et al., 2013). Major indicators of disaster-related vulnerability include multidimensional poverty (for example, limited access to safe water, electricity, and healthcare), climate-dependent livelihoods, gender inequality, inability to evacuate, and displacement (Birkmann et al., 2021). Forced migration or displacement is a serious consequence of disasters. Without targeted interventions, climate-related events could cause approximately 85 million people to migrate internally within sub-Saharan Africa by 2050 (World Bank, 2021a). While voluntary migration is mainly driven by economic reasons, forced migration and climate-related disaster displacements increase vulnerability and weaken the disaster recovery capacity of affected populations (UNDRR, 2019b).

Disaster displacements hinder development progress in affected countries, and key policy frameworks focus on reducing displacement risks. Among others, the United Nations Agenda 2030, adopted in 2015, outlines 17 interconnected Sustainable Development Goals (SDGs) and 169 targets to end poverty, safeguard the planet, and promote prosperity for all by 2030. Specifically, SDG 1.5 states that "By 2030, build the resilience of the poor and those in vulnerable situations and reduce their vulnerability to climate-related extreme weather events and other economic, social, and environmental shocks and disasters" (UN SDGs, 2016). Likewise, the Sendai Framework for Disaster Risk Reduction sets out four priorities and seven targets to reduce disaster risk. Target B aims to "substantially reduce the number of people affected by disasters by 2030," including those impacted by evacuation, displacement, and relocation (UNISDR, 2015). Accordingly, the African Union (AU) adopted the Program of Action for the Implementation of the Sendai Framework for Disaster Risk Reduction (2015–2030) (AU, 2016). This program supports integrating disaster risk reduction (DRR) into regional, national, and subnational sustainable development and climate adaptation strategies, with increased national funding and the mobilization of domestic resources (AU, 2016; UNISDR, 2017).

Other displacement management guiding frameworks in Africa include the 2009 AU Convention for the Protection and Assistance of Internally Displaced Persons (Kampala Convention) and the 2012 Nansen Initiative Agenda for the Protection of Cross-Border Displaced Persons in the context of disasters, including climate-related disasters (AU, 2009; PDD, 2015). The Kampala Convention serves as a legal framework promoting regional and national strategies to prohibit, mitigate, or eliminate the root causes of internal displacement, while providing durable solutions for protecting and assisting IDPs in Africa (AU, 2009). Similarly, the Nansen Initiative promotes protection and assistance for displaced people by encouraging disaster preparedness and strong collaborations between international, regional, national, and local communities and affected populations, to prevent or respond to internal and cross-border climate-induced disaster displacement risks (PDD, 2015). Overall, these global frameworks recognize that effective displacement management should facilitate vulnerability reduction, supported by proactive disaster preparedness, response, and recovery measures.

Displacement management includes actions to prevent displacement, prepare for unavoidable displacement, respond effectively, and find sustainable solutions to strengthen the resilience of displaced populations and host communities. It also involves monitoring their vulnerability to future displacement risks (UNDRR, 2019a). The magnitude and severity of climate-related disasters influence whether displacement is short-term or long-term. Short-term displacement and accommodation centres are temporary shelters established in public spaces by displaced persons or the government, where humanitarian agencies provide relief items such as food and water during disaster responses (IDMC, 2019a). For long-term disaster recovery, disaster management agencies may relocate displaced persons to planned resettlement sites, offering safer, durable solutions that include access to housing, livelihoods, food, potable water, healthcare, and education (IDMC, 2019a). Effective displacement management relies on research-based data to reduce displacement risks, protect internally and cross-border displaced persons, and implement sustainable solutions. This is crucial amid rising climate-related disasters, socioeconomic pressures, and political challenges (PDD, 2015; Spiegel et al., 2023). However, data on direct or indirect climate-induced displacement remains fragmented, and significant gaps still exist in monitoring internal and cross-border displacements, engaging displaced populations, and understanding institutional influences (Arnall et al., 2019; Borderon et al., 2019; Mence & Parrinder, 2017).

Cyclone Idai set a new benchmark for catastrophic disaster impacts in Mozambique, Zimbabwe, and Malawi, which declared states of emergency due to the disaster in March 2019. These countries ranked first, second, and fifth, respectively, among the top 10 disaster-affected nations that year (Germanwatch, 2021; SADC, 2019). The impacts of Cyclone Idai enable critical assessments of displacement dynamics, to identify key lessons, and offer policy insights for climate-related disaster risk reduction and improved displacement management at national and regional levels. Drawing on peer-reviewed literature, government and humanitarian agency reports, and policy documents, this paper examines the impacts of Cyclone Idai-related displacement in Mozambique, focusing on the dynamics of short- to long-term displacement, cross-border movements, and displacement management. The review is contextualized by pre- and post-cyclone vulnerability conditions driving displacement in Mozambique, cross-border migration patterns between Zimbabwe and Malawi, and displacement management during disaster preparedness, response, and recovery.

Pre-Cyclone Idai Displacement Landscape in Mozambique

Before Cyclone Idai, recurrent displacements occurred due to complex interactions between exposure to climate-related hazards, conflicts, and sensitivity factors like multidimensional poverty, which limited adaptive capacities to address displacement. Displacement management, therefore, remains a crucial part of disaster management in Mozambique, amid overlapping systemic vulnerabilities and displacement risk factors (EU et al., 2018; IFRC, 2020a). In 2019, about 95,000 conflict-driven IDPs were present in the country before the cyclones, including Idai (IDMC, 2024a).

Spatial and Climate-Related Factors

Flooding poses a recurring displacement risk in Mozambique, mainly due to exposure in both natural and built environments. Located within the South-West Indian Ocean (SWIO) basin region, Mozambique is downstream of nine major river basins and has Africa's fourth-longest coastline, making it highly vulnerable to flooding and cyclone-related disasters (IFRC, 2020a; Mucova et al., 2021). The SWIO basin is among the most cyclone-prone regions globally. Between 2018 and 2022, 56 tropical cyclones developed in the basin, with 27 making landfall in Mozambique, averaging 2.6 cyclones per season (Serele et al., 2023). From 1969 to 2019, the basin recorded 626 tropical cyclones ranging from category 1 to 5. The year 2019 marked a record for category 4 storms, including Cyclone Idai, and was 67% above the typical annual average of lower-intensity cyclones (Dube et al., 2021). Other significant cyclones affecting Mozambique and neighboring countries include Cyclone Leon-Eline (2000), Cyclone Favio (2007), Cyclone Dineo (2017), and Cyclone Kenneth (2019) (Nhamo & Chikodzi, 2021). On average, floods and storms occur four times more frequently than droughts in Mozambique (EU et al., 2018).

Beyond the natural environment, flooding-related displacement risks in Mozambique are worsened by densely populated urban developments in floodplains and inadequate infrastructure. For example, in Beira city, the capital of Sofala province, where Cyclone Idai made landfall, 40% of the population lives in flood-prone areas and about 70% reside in poorly constructed housing, while poor drainage increases housing damage and causes repeated flood-related displacements (Mixed Migration Centre, 2023; Santos et al., 2023; UN-HABITAT, 2020). Notably, around 60% of Mozambique's population lives along the coast, with 11 of the country's 23 cities located there, including five of its most populated cities: Maputo, Matola, Beira, Nacala, and Quelimane (EU et al., 2018; Palalane et al., 2016). Furthermore, 84% of the 498 localities in Mozambique's central provinces, Sofala, Manica, Tete, and Zambezia, are at risk of climate-related disasters, mainly heavy rain, flooding, and strong winds (IOM & INGD, 2020). Prolonged heavy rainfall, rising river basin overflows, coastal erosion, and rising sea levels all increase flood risks and amplify the impacts of tropical cyclones in Mozambique's coastal cities (Mucova et al., 2021; World Bank, 2025).

Political Factors and Conflicts

Apart from climate-related disasters, war and armed conflicts have greatly affected displacement and disaster management in Mozambique. The country's post-independence era was characterized by a lengthy civil war from 1976 to 1992, which caused about one million deaths, widespread internal migration, and 1.7 million Mozambicans seeking refuge in neighboring countries (Wiles, 2005). Since October 2017, armed conflict in the Cabo Delgado province has displaced over 1.3 million people within the country, with some experiencing secondary and tertiary displacements due to the conflict's expansion, along with cyclones and storms (IDMC, 2024a). By 2021, 84% of those displaced by this conflict lived in temporary settlements in host villages, while around 9% were housed in designated centres (Human Rights Watch, 2022).

Beyond IDPs, migration and displacement from Mozambique into neighboring countries have continued for decades. Cross-border movement is facilitated by the 2005 Southern African Development Community (SADC) Protocol on the Facilitation of Movement of Persons, which allows passport-holders from 16 member countries, including Mozambique, Malawi, and Zimbabwe, to travel visa-free within the region for up to 90 days each year (SADC, 2005). Formal border posts between Mozambique, Zimbabwe, and Malawi exist along major highways; however, borders along less-frequented routes are often merely imaginary lines, permitting unlimited official cross-border movement (Bentley et al., 2012; Daimon, 2016). Migration between Mozambique, Zimbabwe, and Malawi mainly occurs for family visits, formal and informal trade, labour migration, seasonal livelihoods, and displacements caused by climate-related events, conflicts, or civil wars (Chikanda, 2024; Raimundo, 2009, 2021; Raimundo & Chikanda, 2016). Between 2007 and 2017, Mozambique's population grew from 20,670,000 to 27,106,207 (INE, 2019), with nationals from Malawi (65,2950) and Zimbabwe (15,083) being the second and third largest groups (Raimundo, 2021). Furthermore, more Mozambicans live in Malawi than in other Southern African countries (Raimundo, 2009).

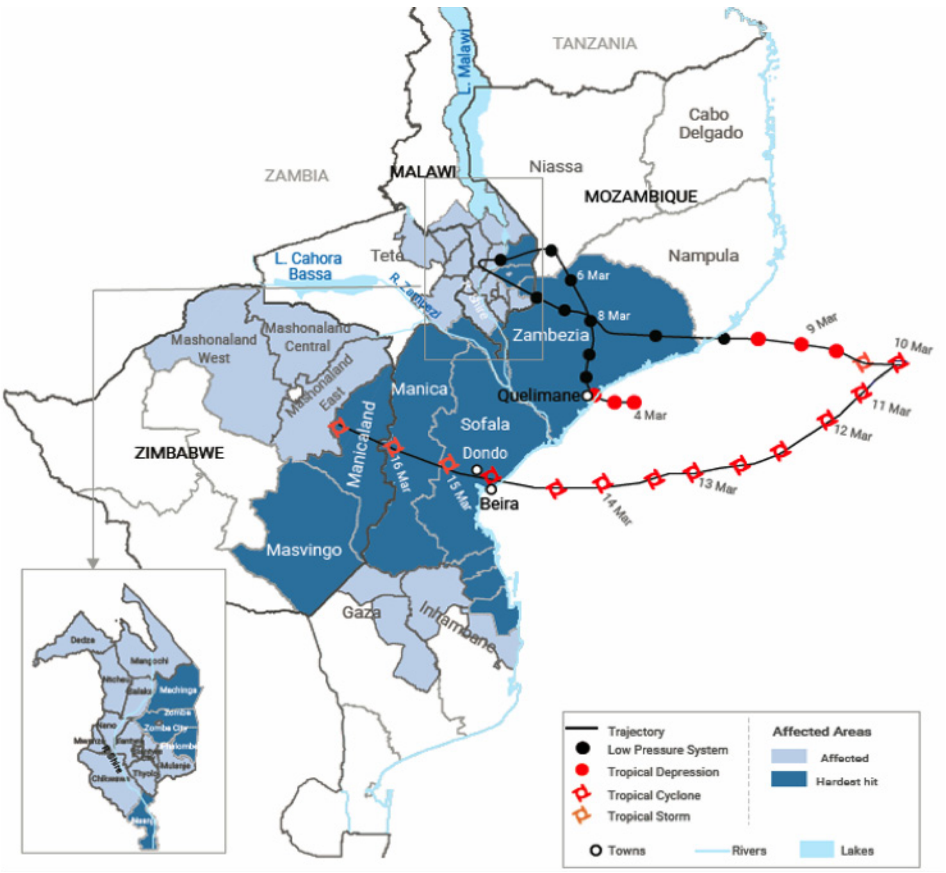
Economic Factors and Disruption of Livelihoods

Recurrent climate-related disasters continuously impact the agricultural livelihoods of people in Mozambique, increasing poverty and hindering climate adaptation. The agricultural sector is vital to the country's economy, with about 80% of the population relying on climate-sensitive agri-food livelihoods (USAID, 2021). Each year, around 1.8 million people face cyclone-related events in Mozambique, costing approximately USD 170 million per cyclone season (Serele et al., 2023). Before Cyclone Idai struck in March 2019, roughly 1.78 million people were already severely food insecure from September to December 2018 due to extended droughts in parts of Mozambique (GoM, 2019). About 62% of the population experiences multidimensional poverty, lacking access to healthcare, education, and basic living standards such as housing (UNDP, 2023). In 2021, Mozambique ranked 185th out of 191 countries on the Human Development Index, with roughly 60% of the population living below the USD 1.9 per day poverty line (World Bank, 2021b).

Post-Cyclone Displacement in Mozambique and Regional Dynamics

Amid underlying vulnerabilities, Cyclone Idai made landfall on March 4th as a tropical depression in the Zambezia province, bringing heavy rainfall for a week before looping back into the SWIO, where it intensified into a tropical cyclone. It finally struck Beira on March 14-15 (Figure 1) (IDMC, 2019a, 2019b). This was a Category 4 storm with wind speeds reaching up to 210 km/h and causing floods over 6 metres high in some areas, submerging more than 3,000 km of land and affecting densely populated regions in Beira, Chibabava, Buzi, Dondo, and Nhamatanda districts (INGD, 2019; OCHA, 2019d). Sixty-five percent of localities in Mozambique's central provinces of Sofala, Tete, and Zambezia were affected; however, the areas around Beira city experienced the most severe impact (IOM & INGD, 2020; Municipality of Beira, 2019). The cyclone then spread to eastern Zimbabwe and southern Malawi on March 15-16, amid torrential rainfall, before dissipating on March 21, making it an unusually extended cyclonic system (Figure 1) (Norton et al., 2020). Zimbabwe's most affected provinces were Manicaland and Masvingo, with Manicaland, especially the Chimanimani district, being hardest hit (Nhamo & Chikodzi, 2021). In Malawi, fourteen districts were directly impacted, with Zomba, Chikwawa, Phalombe, and Nsanje being the most severely affected (Norton et al., 2020).

Figure 1: Cyclone Idai's Pathway and Flooded Areas



Source: IDMC (2019a)

Despite recurrent economic costs related to disasters, Cyclone Idai has been the most expensive tropical cyclone in the SWIO basin and remains unforgettable among humanitarian circles due to its deadly, catastrophic, and geographically widespread impacts (Norton et al., 2020; Yu et al., 2019). Cyclone Idai caused a complete breakdown of infrastructure and systems that connect households to education, healthcare, food, water, electricity, transportation, and communication in the affected districts of Mozambique, Zimbabwe, and Malawi (Municipality of Beira, 2019; Norton et al., 2020). Since Zimbabwe and Malawi are landlocked, Cyclone Idai's extensive damage to the Port of Beira, along with transport and supply chains, limited the movement of supplies to these countries (Nhamo & Chikodzi, 2021). In Mozambique, the most urgent needs following Cyclone Idai were in housing, transportation infrastructure, agriculture, and food security (GoM, 2019).

In Mozambique, Cyclone Idai affected approximately 1.85 million people, displaced over 400,000, injured 1,500, and caused 603 deaths across the affected provinces (Table 1) (GoM, 2019). Beira city experienced significant impacts, with about 90% of the city's infrastructure suffering damage ranging from partial to total (Norton et al., 2020). Less than 50% of IDPs were in accommodation centres, while the majority lived with host communities, families, and friends (GoM, 2019; Mixed Migration Centre, 2023). The post-disaster needs assessment estimates that the total economic cost of the disaster impacts was USD 1.4 billion, and the total recovery cost was USD 2.9 billion (GoM, 2019).

In Malawi, Cyclone Idai affected about 840,000 people in sparsely populated areas, resulting in 56 deaths, 577 injuries, and approximately 86,976 displacements (Table 1) (DoDMA, 2019b; Mercy Corps, 2019). There were 173 accommodation centres set up in facilities like schools, churches, and classrooms, where displaced households received shelter and relief supplies from humanitarian partners and the government (DoDMA, 2019; IDMC, 2019b). The post-disaster needs assessment estimates the total economic cost of the disaster impacts at USD 220 million. Conversely, the total costs for recovery and reconstruction are USD 370.5 million (Government of Malawi, 2019).

Floods and landslides accompanying Cyclone Idai in Zimbabwe affected about 270,000 people and displaced 50,905, with over 344 fatalities and hundreds reported missing (Table 1) (Mercy Corps, 2019). Most internally displaced persons (IDPs) in Zimbabwe resided in host communities rather than in temporary accommodation centres housed in public, government, and school buildings (OCHA, 2019b). The post-disaster needs assessment estimates the total economic impact of the disaster at USD 622 million, with a total recovery cost of USD 1.1 billion (World Bank, 2019).

Post-cyclone Idai displacements were mostly internal, but some cross-border displacements occurred. There are no records of displacement from Mozambique into Zimbabwe related to Cyclone Idai; however, a few Zimbabweans crossed into Mozambique. According to Mashula et al. (2021), along the Chimanimani border between Mozambique and Zimbabwe, 91% of displaced households remained in Zimbabwe, although 4% migrated to South Africa, 1% to Mozambique, and the rest to other countries after Cyclone Idai. The highest Cyclone Idai-related deaths in Zimbabwe were in Chimanimani, and floods carried some bodies across the border into Mozambique (Nhamo & Chikodzi, 2021; Spiegel et al., 2023). Notably, along the Mozambique–Malawi border, about 1,900 Mozambicans were displaced into Nsanje, Malawi, seeking shelter and emergency assistance, although there were no reports of Malawians crossing into Mozambique after Cyclone Idai (UNHCR, 2019b; UNICEF, 2019).

Post-Cyclone Displacement Vulnerabilities in Mozambique

Displacement management, which includes measures to prevent, prepare for, respond to, and build resilience against displacement risks through durable solutions (UNDRR, 2019a), is a part of disaster management in Mozambique and aligns with the Sendai framework. The Government of Mozambique (GoM) oversees disaster management through the National Institute of Disaster Management (INGD) and receives support from various humanitarian agencies such as the International Federation of the Red Cross and the United Nations High Commissioner for Refugees (GoM, 2019; INGD, 2019). Post-Cyclone Idai displacement involved both short- and long-term dynamics, connected to the disaster management stages of preparedness, response, and recovery. The short-term phase included evacuation to accommodation centres during emergency response, while the long-term phase involved relocating people to resettlement sites as part of disaster recovery.

Short-term Phase

Fewer than 50% of the Cyclone Idai-related IDPs in Mozambique, approximately 140,000 people, lived in accommodation centres, with most being women (IDMC, 2019b). At

Table 1: Summary of Cyclone Idai's Regional Impacts, including Displacement

Human impacts	Mozambique	Malawi	Zimbabwe
People affected	1,850,000	840,000	270,000
Injuries	1,500	577	183
Fatalities	603	56	344
People newly displaced	478,169	86,976	50,905
People officially sheltered post-event	77,019	1,273	42,874

Compiled by Author using IDMC (2019b); Norton et al. (2020); DoDMA (2019b) these centres, IDPs depended on humanitarian aid for basic needs such as water, food, shelter, clothing, and sanitation (OCHA, 2019b, 2019c). However, during post-cyclone flood conditions, latrine overflows and contaminated water supplies caused disease outbreaks like cholera, which worsened health challenges and led to fatalities, especially in overcrowded centres (Lequechane et al., 2020). As a result, the government of Mozambique and humanitarian agencies established emergency health services to combat cholera and malaria and facilitate vaccinations, particularly for children under five in accommodation centres (OCHA, 2019c). Additionally, displacement tracking systems were introduced to identify the most vulnerable IDPs within and outside these centres, including children, pregnant and breastfeeding women, and individuals with disabilities, to provide targeted help (OCHA, 2019c). Notably, because accommodation centres were set up sporadically during the emergency response, many were inadequately furnished to meet the needs of large IDP populations, and access to healthcare, quality food, and clean water remained limited (GoM, 2019). Other issues included overcrowding, lack of safe drinking water, poor sanitation facilities, and reports of gender-based violence, especially against women and children (SADC, 2019).

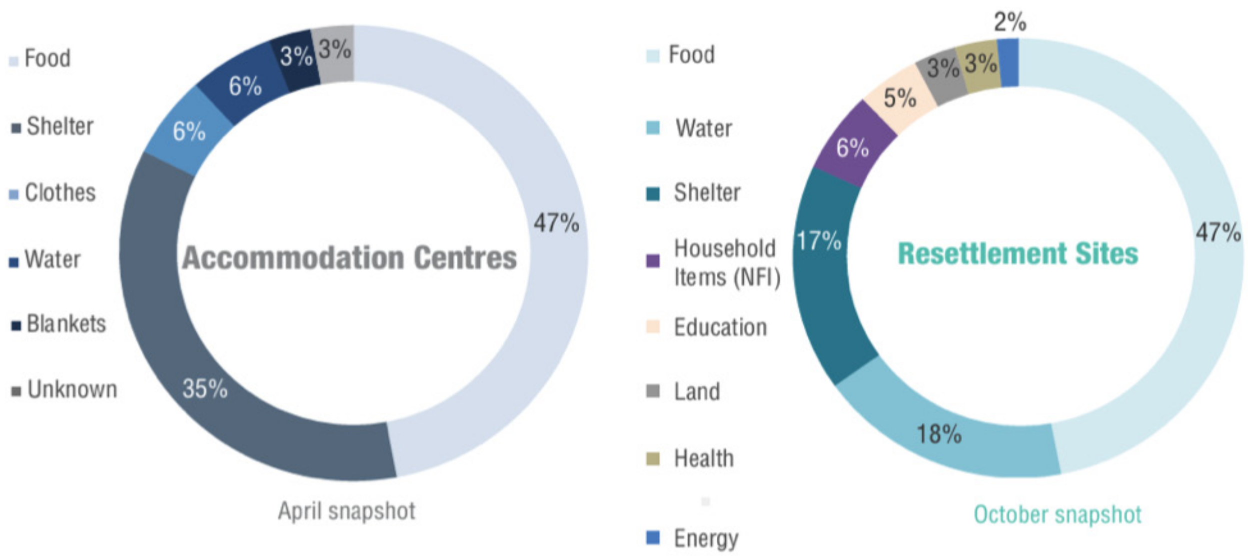
Long-term Phase

Emergency response after Cyclone Idai concluded in May–June 2019, with the closure of accommodation centres and the relocation of over 93,000 IDPs to permanent resettlement sites for disaster recovery (IDMC, 2019a; IOM, 2020; UNHCR, 2019b). At these sites, IDPs required initial support with shelter and relief items until they became self-sufficient (IOM, 2020). However, resettlement areas faced several challenges, including unsafe shelter conditions lacking lighting, sanitation, or drainage systems, as well as limited access to food, water, livelihoods, markets, and arable land (UNHCR, 2019a). Access to social amenities such as healthcare, education facilities, and protection services, especially for women, children, and people with disabilities, was limited due to the remote locations of most resettlement centres (Jacobs & Almeida, 2021). Traumatized IDPs experienced family separation, difficulty obtaining civil documentation, and tensions in host communities over existing service facilities and livelihood activities at resettlement sites (Nhamo & Chikodzi, 2021; Sunu, 2024; UNHCR, 2019a).

About a year after Cyclone Idai, challenges in resettlement sites continued, reducing the ability of IDPs to support themselves amid declining humanitarian aid (IOM, 2020; Norton et al., 2020). Several households returned to their previous high-risk neighborhoods in search of livelihoods (especially fishing communities) and to be closer to social amenities (Kleinfeld, 2019). In Beira, IDPs preferred to live in survival mode during short-term displacements rather than relocating to distant areas. The city offers diverse livelihood opportunities, particularly in fishing and informal employment, along with affordable housing, though often substandard (Mixed Migration Centre, 2023). The goal of resettlement to build resilience against future disasters remained unfulfilled, increasing the vulnerability of IDPs and making them reliant on donors. An assessment eight months after Cyclone Idai found that only 11% of IDPs planned to stay in resettlement sites permanently (IDMC, 2019a). Resettled households experienced long-term disruptions to their livelihoods, social ties, and access to education, healthcare, and sanitation services (IDMC, 2019b). While IDPs gradually moved from temporary centres to permanent resettlement sites after the cyclone, the humanitarian needs of both groups remained substantial, requiring ongoing support and heightening donor dependence (Figure 2).

Notably, most IDPs lived in host communities and with family members, placing pressure on the finances and resources of hosts who lacked access to humanitarian assistance (Nhamo & Chikodzi, 2021; Sunu, 2024). By residing with friends and family after the disaster, some IDPs missed out on registration opportunities to receive humanitarian aid (Jacobs & Almeida, 2021). The loss of documents among

Figure 2: Shifts in Humanitarian Needs: Accommodation Centres versus Resettlement Sites Eight Months Post-Cyclone Idai



Source: (IDMC 2019a)

IDPs created barriers to accessing social services, such as healthcare, jobs, and financial support, and led to land ownership conflicts during disaster recovery (GoM, 2019). Beyond IDPs, entire communities faced growing humanitarian needs. They had limited access to clean water, food, and shelter, while farming livelihoods were constrained by inundated farmlands, loss of farming equipment, and reduced agricultural output during recovery (GoM, 2019).

The Case of Cross-Border Displaced Persons

Post-Cyclone Idai collaborations between the Department of Disaster Management Affairs in Malawi and INGD, Mozambique, indicated that most of the 1,900 cross-border displaced Mozambicans in accommodation centres or host communities in Nsanje, Malawi, preferred to stay in Malawi as long as they had access to land, but would resettle in Mozambique if they received support to rebuild houses and farming livelihoods (UNHCR, 2019b). While Mozambique's post-Cyclone Idai needs assessment highlighted the importance of increased coordination between the INGD and other disaster management institutions for disaster response, the report made no references to support for cross-border displaced persons (GoM, 2019).

Displacement Management for Cyclone Idai

The main framework for disaster management in Mozambique is the National Disaster Risk Reduction Master Plan (PDRRD) (2017–2030), which sets out objectives for disaster prevention, preparedness, response, and recovery. It aligns with the priorities of the Sendai Framework DRR for reducing climate-related vulnerability, including displacement (World Bank, 2017). The PDRRD is legally supported by the 2020 Law on Disaster Risk Reduction and Management (Law 10/2020), offering a solid legal foundation for disaster management and response in Mozambique (UNEP, 2020). These frameworks helped manage displacement caused by Cyclone Idai, aligning with the disaster management stages of preparedness, response, and recovery.

Information on disaster risk shared through effective early warning systems is vital for encouraging disaster preparedness (IPCC, 2022). However, the unusual formation of Cyclone Idai delayed accurate forecasts of its strength and landfall until a few days before the event (Kolstad, 2021). Although early warning systems existed in cyclone-prone areas, the unpredictability of Cyclone Idai limited their effectiveness in reaching some at-risk communities (IDMC, 2019a). Gwimbi (2021) pointed out fragmented dissemination of warning messages about Cyclone Idai's risks across the three affected countries, exposing gaps in early warning systems that worsened the disaster's impacts. There is limited information on evacuations or infrastructural reinforcements in preparedness for Cyclone Idai's impact (IDMC, 2019b). With restricted risk communication, disaster preparedness for a powerful cyclone like Idai was inadequate at all levels.

The disaster response phase involved managing the needs of IDPs both within and outside accommodation centres, as well as non-displaced households, which required effective coordination and the timely delivery of humanitarian aid (SADC, 2019). Notably, over 30 institutions, including federal, provincial, municipal, local, and international humanitarian actors, worked together during the Cyclone Idai emergency response. This collaboration was beneficial but still needed effective coordination (GoM, 2019). However, pre-existing coordination problems among disaster management actors from federal, municipal, local, and donor sectors resulted in fragmented relief supply distribution, duplicated efforts, and the marginalization of some severely affected populations in Mozambique (IFRC, 2021; Sunu, 2024). Furthermore, poor road conditions and disruptions in transportation and supply chains hampered humanitarian aid delivery, including food and non-food supplies, to severely impacted IDPs and non-IDPs. In some areas, supplies arrived only after a week and were airlifted to reach stranded households (Chari et al., 2021; Nhamo & Chikodzi, 2021).

For disaster recovery, government-led resettlement of IDPs requires relocation to well-planned, safe, and permanent sites, guided by principles of communication and community engagement, durable solutions, compensation, and livelihood protection (Tadgell et al., 2018). However, many IDPs were hardly involved in resettlement location decisions, and communication about site conditions was absent after Cyclone Idai (Jacobs & Almeida, 2021). Additionally, because of Mozambique's 2019 elections, the establishment of most resettlement sites was hurried, resulting in remote sites with limited access to livelihoods and basic services, further increasing the vulnerability of IDPs (Amao, 2019). Beyond reducing flood risks for most resettled IDPs from Beira, there was a decline in socioeconomic conditions and growing uncertainty about whether to stay in the resettlement sites or return to their original flood-prone communities (Mixed Migration Centre, 2023). Instead of building resilience, resettlement often heightened vulnerability and made many IDPs more susceptible to future displacement risks. Despite some cooperation on the needs of cross-border displaced persons seeking shelter in Malawi, there were no guidelines to support their resettlement in Mozambique. As a result, cross-border Mozambican displaced persons at the Bangula shelter in Malawi chose to stay and rely on diminishing humanitarian aid without resettlement or return (UNHCR, 2019b).

Given the significant public costs associated with disaster management, the Government of Mozambique promotes financial protection against disasters. Notably, the State allocated 0.1% of its budget to the 2017–2030 Disaster Management Fund (Decree No. 53/2017) to operationalize the fund and mobilize financial resources for disaster management (World Bank, 2017). Amid multiple annual climate-related hazards and costs, funding is mainly donor-dependent and driven by disaster response efforts, creating key challenges for displacement management. Tropical Cyclone Idai ranks as the third deadliest and most costly cyclone in the SWIO basin (Yu et al., 2019). However, only

45% of Mozambique's humanitarian appeal of USD 2.9 billion for Cyclone Idai was funded (OCHA, 2019a). Six weeks after Cyclone Idai, Cyclone Kenneth struck the war-torn Cabo Delgado province in Mozambique, pushing the cost of post-disaster needs to USD 3.2 billion and requiring the diversion of strained humanitarian resources (GoM, 2019; UNICEF, 2019). Consequently, disaster management capacities and humanitarian aid were stretched and overwhelmed in addressing post-Cyclone Idai needs.

Towards Stronger National and Regional Displacement Management

The 2019 cyclones in the Southern African Region revealed gaps and provided key lessons for displacement management at various levels.

Within Mozambique

Cyclone Idai highlighted the critical importance of disaster preparedness, which influenced DRR reforms. Notably, Displacement Tracking Matrix assessments in November 2019 showed improved planning, with 75% of localities in central Mozambican provinces establishing evacuation routes, and 82% designating public buildings as accommodation centres for unavoidable floods and cyclone displacements (IOM & INGD, 2020). Furthermore, in 2020, the Climate Risk and Early Warning Systems (CREWS) initiative launched a five-year USD 4 million project to strengthen multi-hazard early warning systems in climate-vulnerable regions, including the SWIO, supporting disaster preparedness in countries like Mozambique (CREWS, 2021). As climate-related stresses across the country and region increase, further investments in early warning systems and disaster preparedness become essential. A compelling reason to invest in disaster risk reduction is that USD 1 spent on preparedness can save USD 4–7 in disaster response (UNDRR, 2023).

Donor assistance is crucial for reducing vulnerability and managing disasters; however, it is often insufficient, especially for events like Cyclone Idai, whose impacts crossed provincial and national borders, while response and recovery funding were severely lacking. Despite improved domestic resource mobilization for disaster management, such as the 2017–2030 Disaster Management Fund (EU et al., 2018), more financing is needed to address the root causes of multidimensional poverty and to promote climate-resilient development that reduces displacement risks. Large financial gaps remain; for example, in Beira city alone, over USD 580 million is needed for basic housing, climate-resistant roads, waste management, drainage systems, and coastal defence upgrades to decrease displacement risks (UN-HABITAT, 2020). Only 1% of climate finance in Africa originates from private philanthropic donors, highlighting the need to boost private and public sector investments to support national efforts through fostering green economies, bankable DRR projects, and comprehensive risk and investment data (UNDP, 2024).

Displacement management has usually adopted a top-down approach, neglecting the capacity of displaced groups to influence the development of justice-based, inclusive, and sustainable solutions (Arnall et al., 2019). In the face of limited formal disaster management efforts after Cyclone Idai, access to resources such as social capital networks of family, friends, religious groups, and host communities enhanced the adaptive ability of most IDPs (GoM, 2019). A common coping mechanism used by households during the Cyclone Idai response was borrowing from friends and family to meet basic needs (McCordic et al., 2022). For IDPs, access to strong social capital—comprising family, community, and religious networks—facilitated the mobilization of essential resources, including food, cash, and building materials. However, disadvantaged groups had fewer and more vulnerable displaced networks (Sunu et al., 2025). Therefore, community engagement is crucial for fostering social cohesion and improving displacement management.

Notably, Mozambique adopted the Policy and Strategy for the Management of Internally Displaced Persons in 2021, becoming one of the first African countries to implement a national displacement policy that includes disaster risk reduction, climate adaptation, and conflict sensitivity (GoM, 2021). This policy details institutional roles and engagement procedures in planning, budgeting, and coordinating displacement management, while stressing collaboration among local DRR organizations, the media, community partners, and displaced people to achieve sustainable solutions (UNDRR, 2025). As a result, the country has become a regional leader in integrating displacement management with traditional disaster management approaches, adopting both the Sendai Framework and the Kampala Convention. Despite ongoing resettlement challenges, insights from Cyclone Idai and the new policy have contributed to more sustainable solutions. Over 90% of IDPs in Sofala province intend to remain at resettlement sites during subsequent cyclones after 2019, amid various efforts to improve living conditions (IOM & INGD, 2023).

According to the Sendai Framework, strengthening resilience to displacement risks involves integrating DRR into land-use policies, urban planning, rural development, and ecological management to ensure safe human settlements while conserving ecosystem functions (UNISDR, 2015). Furthermore, effective flood resilience policies should promote systematic approaches through investment in flood-resistant infrastructure to prevent or manage floods in low-risk areas, proactive and planned resettlement for zones with high flood risk, and strict urban zoning to limit new developments in high-risk floodplains, all supported by inclusive community participation (Doberstein et al., 2019). Durable solutions for IDPs should enable return, local integration, and relocation in ways that reduce displacement impacts and decrease dependence on donors (IOM & INGD, 2023).

Regional level: SADC and AU

In response to Cyclone Idai, the SADC launched a regional donor assistance appeal to complement country-specific appeals and strengthen national disaster management and coordination capacities for response and recovery (SADC, 2019). While this shows regional cooperation in disaster management, it also reveals insufficient regional preparedness to handle the impacts of disasters that cross borders and a heavy reliance on international humanitarian support for climate-related disasters. The unprecedented human, ecological, economic, and social impacts of Cyclone Idai in Mozambique, Zimbabwe, Malawi, and other southern African nations reversed progress made toward key targets on poverty and DRR (SDG 1.5). Recognition and preparedness for transboundary climate-related disaster impacts, such as displacements, should be supported by regulatory frameworks to boost regional adaptive capacities. Without these frameworks, long-term resilience and sustainable development are at risk.

The impacts of Cyclone Idai further exposed the financial constraints in the AU's regional disaster risk management strategies. The AU's contribution of USD 350,000 to the affected countries was delayed and was markedly overshadowed by financial pledges from international and humanitarian partners, including £18 million from the United Kingdom and USD 4.9 million from the United Arab Emirates (Amao, 2019). While the AU's African Risk Capacity Group insured some eligible member states against slow-onset climate-related disasters such as droughts, it did not cover rapid-onset impacts from tropical cyclones and floods in 2019. Learning from Cyclone Idai, the African Risk Capacity Group introduced parametric tropical insurance coverage in 2021 for the SWIO basin countries, including Mozambique. This initiative aims to bolster the adaptive capacities of countries to anticipate, manage, and reduce cyclone-induced disaster impacts, including displacement (AU & ARC, 2020).

The parametric insurance package has been adopted by 35 out of 55 AU member countries; however, only about 13 countries regularly purchase coverage. Persuading countries to pay insurance premiums amid competing national priorities like health and education is challenging (Global Index Insurance Forum, 2021). Innovations are needed to incentivize AU member countries to adopt climate-related insurance. On average, African countries lose about 2-5% of their Gross Domestic Product to climate impacts, which strains their poverty reduction and disaster response budgets (WMO, 2024). Meanwhile, humanitarian aid budgets have been cut within current geopolitical contexts (PDD, 2025). Innovations might include offering generous funding packages for those who pay premiums (Amao, 2019), particularly in countries with enhanced disaster preparedness policies and strategies.

Conclusion and Recommendations

Displacement caused by Cyclone Idai exposed underlying vulnerabilities and created new ones, especially in Mozambique and the SWIO region, where households are highly vulnerable to disasters. The impact of Cyclone Idai on displaced populations resulted from complex interactions between multiple vulnerabilities, inadequate disaster preparedness and resettlement plans, and challenges in disaster management. Displaced individuals faced long-term risks such as landlessness, loss of livelihoods, food insecurity, disruption of social networks, and limited access to essential services like healthcare and education. Climate models project an increase in the frequency and severity of storms and cyclones reaching Mozambique's coast by 2050 and beyond (IPCC, 2022). Effective solutions for climate-related displacement require stronger cooperation and coherence across development, DRR, humanitarian, human mobility, and climate change sectors and frameworks (PDD, 2025). Furthermore, involving at-risk communities in addressing the root causes of vulnerability will build local capacity and enhance resilience against displacement risks.

In line with the Kampala Convention and Nansen Initiative, cross-border displaced persons from Mozambique were welcomed into neighboring countries like Malawi for refuge and provided with safe conditions during their stay and potential return. However, the capacity of host countries and communities was severely limited due to similar impacts from the cyclone and shared regional vulnerabilities. This resulted in diminished focus on cross-border displacements. Displacement risks are high in sub-Saharan Africa, including the Southern African region, where rapid urbanization is characterized by increasing poverty, inadequate social infrastructure, and the growth of informal settlements in climate-vulnerable areas such as floodplains (UNDP & UN -Habitat, 2022). According to the ND-GAIN Country Index, which assesses the vulnerability of countries to global challenges like climate change alongside their disaster preparedness, Mozambique, Malawi, and Zimbabwe ranked 156, 169, and 174, respectively, out of 187 countries, indicating their high vulnerability coupled with low preparedness (ND-GAIN, 2025). The transboundary impacts of Cyclone Idai highlight the need to strengthen regional DRR policy frameworks and increase financial investments in disaster preparedness, climate-resilient development, and institutional strengthening, to mitigate both national and cross-border displacements within the SWIO region.

References

African Union (AU) (2009). *African Union Convention for the Protection and Assistance of Internally Displaced Persons in Africa (Kampala Convention)*. https://au.int/en/treaties/african-union-convention-protection-and-assistance-internally-displaced-persons-africa

African Union (AU). (2016). *Aligning the African Union with the Sendai Framework for Disaster Risk Reduction*. https://policycommons.net/artifacts/2387881/the-african-union-commission/3408893/

Amao, F. (2019). *Cyclone Idai showed how some countries battle to handle disasters*. UNDRR and PreventionWeb. https://www.preventionweb.net/news/cyclone-idai-showed-how-some-countries-battle-handle-disasters

Arnall, A., Hilson, C., & McKinnon, C. (2019). Climate displacement and resettlement: the importance of claims-making 'from below.' *Climate Policy, 19*(6), 665-671.

AU, & ARC. (2020). *Launch of the first parametric tropical cyclone risk insurance product in Africa*. https://au.int/en/pressreleases/20201221/joint-au-arc-press-release-launch-first-parametric-tropical-cyclone-risk

Bentley, J. W., Robson, M., Sibale, B. B., Nkhulungo, E., Tembo, Y., & Munthali, F. (2012). Travelling companions: Emerging diseases of people, animals and plants along the Malawi-Mozambique border. *Human Ecology, 40*(4), 557.

Birkmann, J., Cardona, O. D., Carreño, M. L., Barbat, A. H., Pelling, M., Schneiderbauer, S., Kienberger, S., Keiler, M., Alexander, D., Zeil, P., & Welle, T. (2013). Framing vulnerability, risk and societal responses: The MOVE framework. *Natural Hazards, 67*(2), 193–211.

Birkmann, J., Feldmeyer, D., McMillan, J. M., Solecki, W., Totin, E., Roberts, D., Trisos, C., Jamshed, A., Boyd, E., & Wrathall, D. (2021). Regional clusters of vulnerability show the need for transboundary cooperation. *Environmental Research Letters, 16*(9), 094052.

Borderon, M., Sakdapolrak, P., Muttarak, R., Kebede, E., Pagogna, R., & Sporer, E. (2019). Migration influenced by environmental change in Africa: A systematic review of empirical evidence. *Demographic Research, 41*, 491-544.

Chari, F., Ngcamu, B. S., & Novukela, C. (2021). Supply chain risks in humanitarian relief operations: a case of Cyclone Idai relief efforts in Zimbabwe. *Journal of Humanitarian Logistics and Supply Chain Management, 11*(1), 29-45.

Chikanda, A. (2024). Informal cross-border traders and food trade during the global pandemic in Zimbabwe. *African Human Mobility Review, 10*(3).

CREWS. (2021). *South-west Indian Ocean.* https://crews-initiative.org/project/supporting-regional-cooperation-strengthen-seamless-operational-forecasting-and-multi/

Daimon, A. (2016). Commuter migration across artificial frontiers: The case of partitioned communities along the Zimbabwe-Mozambique border. *Journal of Borderlands Studies, 31*(4), 463-479.

Department of Disaster Management Affairs (DoDMA) (2019). Malawi: Floods response situation Report No.5. https://reliefweb.int/report/malawi/malawi-floods-situation-report-no-5-20th-may-2019

Doberstein, B., Fitzgibbons, J., & Mitchell, C. (2019). Protect, accommodate, retreat or avoid (PARA): Canadian community options for flood disaster risk reduction and flood resilience. *Natural Hazards, 98*(1), 31-50.

Dube, K., Chapungu, L., & Fitchett, J. M. (2021). Meteorological and climatic aspects of Cyclone Idai and Kenneth. In G. Nhamo & K. Dube (Eds.), *Cyclones in Southern Africa* (pp. 19-36). Cham: Springer.

EU, World Bank, & GFDRR. (2018). F*inancial Protection against Disasters in Mozambique* (Issue April). https://www.gfdrr.org/en/publication/financial-protection-against-disasters-mozambique

Germanwatch. (2021). *Global Climate Risk Index (CRI)*. https://www.germanwatch.org/en/19777

Global Index Insurance Forum. (2021). *Africa Risk Capacity (ARC) Group Spotlight Interview.* Global Index Insurance Forum. https://www.indexinsuranceforum.org/blog/africa-risk-capacity-arc-group-spotlight-interview

Government of Malawi. (2019). *Malawi 2019 floods post-disaster needs assessment report.* PreventionWeb. https://www.preventionweb.net/publication/malawi-2019-floods-post-disaster-needs-assessment-report

Government of Mozambique (GoM) (2019). *Mozambique Cyclone Idai: Post-disaster needs assessment* (Issue May). https://www.humanitarianresponse.info/en/operations/mozambique/assessment/mozambique-cyclone-idai-post-disaster-needs-assessment

Government of Mozambique (GoM) (2021). *Mozambique: Policy/Strategy on the Management of Internally Displaced People (Resolution 41/2021)*. https://www.refworld.org/policy/strategy/natlegbod/2021/en/147633

Gwimbi, P. (2021). A review of Tropical Cyclone Idai forecasting, warning message dissemination and public response aspects of early warning systems in Southern Africa. In G. Nhamo & K. Dube (Eds.), *Cyclones in Southern Africa: Volume 2: Foundational and Fundamental Topics* (pp. 37-52). Cham: Springer.

Human Rights Watch. (2022). *World Report 2022: Mozambique Events of 2021.* https://www.hrw.org/world-report/2022/country-chapters/mozambique

Internal Displacement Monitoring Centre (IDMC) (2019a). *Eight months after Idai: Chronology of displacement, humanitarian needs and challenges going forward.* https://www.internal-displacement.org/publications/eight-months-after-idai-chronology-of-displacement-humanitarian-needs-and-challenges/

Internal Displacement Monitoring Centre (IDMC) (2019b). *Tropical Cyclone Idai Figure Analysis – Displacement Related to Disasters.* https://www.internal-displacement.org/sites/default/files/inline-files/GRID-2019-Disasters-Figure-Analysis-Idai.pdf

Internal Displacement Monitoring Centre (IDMC) (2024a). *7 years into the conflict, solutions to displacement in Cabo Delgado remain elusive | IDMC - Internal Displacement Monitoring Centre*. https://www.internal-displacement.org/expert-analysis/7-years-into-the-conflict-solutions-to-displacement-in-cabo-delgado-remain-elusive/

Internal Displacement Monitoring Centre (IDMC) (2024b). *Global Report on Internal Displacement (GRID)*. https://www.internal-displacement.org/global-report/grid2024/

International Federation of Red Cross and Red Crescent Societies (IFRC) (2020a). *Mozambique: Floods Early Action Protocol summary*. https://reliefweb.int/report/mozambique/mozambique-floods-early-action-protocol-summary

International Federation of Red Cross and Red Crescent Societies (IFRC) (2020b). *World Disasters Report 2020: Come Heat or High Water*. https://www.ifrc.org/sites/default/files/2021-05/20201116_WorldDisasters_Full.pdf

International Federation of Red Cross and Red Crescent Societies (IFRC) (2021). *Legal preparedness for international disaster assistance in Mozambique: Mapping of domestic laws and policies*. https://disasterlaw.ifrc.org/sites/default/files/media/disaster_law/2021-06/IDRL%20in%20Southern%20Africa%20Country%20Profile%20-%20Mozambique.pdf

Instituto Nacional de Estatística (INE) (2019). *Recenseamento geral da população e habitação — Moçambique 2017—Resultados definitivos*. Maputo: Instituto Nacional de Estatística.

Instituto Nacional de Gestão e Redução do Risco de Desastres (INGD) (2019). *Report from the Provincial Emergency Operational Center on the Impacts of Cyclone Idai - Rain and Cyclone Season 2018-2019*.

Intergovernmental Panel on Climate Change (IPCC) (2022). *Climate change 2022: Impacts, adaptation and vulnerability*. https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/

International Organization for Migration (IOM) (2020). *One year on, people displaced by Cyclone Idai struggle to rebuild – Mozambique*. https://reliefweb.int/report/mozambique/one-year-people-displaced-cyclone-idai-struggle-rebuild

International Organization for Migration (IOM) (2021). *Institutional Strategy on Migration, Environment and Climate Change 2021-2030*. https://publications.iom.int/books/institutional-strategy-migration-environment-and-climate-change-2021-2030

IOM, & INGD. (2020). *Mozambique disaster risk assessment. January*. https://www.iom.int/sites/g/files/tmzbdl486/files/dtm/mozambique_-_disaster_risk_assessment_january_2020.pdf

IOM, & INGD. (2023). *Progress towards achieving durable solutions, Sofala (November 2023) Displacement Tracking Matrix*. https://dtm.iom.int/reports/iom-mozambique-progress-towards-achieving-durable-solutions-sofala-november-2023

Jacobs, C., & Almeida, B. (2021). Government-led resettlement after natural disasters as a durable solution? The case of Cyclone Idai. *Refugee Survey Quarterly, 40*(2), 239–247.

Kleinfeld, P. (2019). Mozambique cyclone victims face bleak resettlement prospects. *The New Humanitarian*. https://www.thenewhumanitarian.org/news-feature/2019/12/10/Mozambique-Cyclone-Idai-Resettlement-climate-change

Kolstad, E. W. (2021). Prediction and precursors of Idai and 38 other tropical cyclones and storms in the Mozambique Channel. *Quarterly Journal of the Royal Meteorological Society, 147*(734), 45–57.

Lequechane, J. D., Mahumane, A., Chale, F., Nhabomba, C., Salomão, C., Lameira, C., Chicumbe, S., & Semá Baltazar, C. (2020). Mozambique's response to cyclone Idai: How collaboration and surveillance with water, sanitation and hygiene (WASH) interventions were used to control a cholera epidemic. *Infectious Diseases of Poverty, 9*(1), 4-7.

Mashula, N., Ntombela, N. G., Kunene, H. P., Sehlapelo, D., & Pophiwa, N. (2021). Exploring the migration effects of cyclones and floods in Southern Africa: A focus on 2019 floods and Cyclones Idai and Kenneth. In G. Nhamo & L. Chapungo (Eds.), *The increasing risk of floods and tornadoes in Southern Africa* (pp. 175-190). Cham: Springer.

McCordic, C., Mohammadi, E., & Singh, S. (2022). The priorities and coping strategies of severely food insecure households in Beira in response to Cyclone Idai. *International Journal of Disaster Risk Reduction, 83*(September), 103423.

Mence, V., & Parrinder, A. (2017). Environmentally related international migration: Policy challenges. In M. McAuliffe & K. Koser (Eds.), *A long way to go: Irregular migration patterns, processes, drivers and decision-making* (pp. 317-342). Australian National University.

Mercy Corps. (2019). *The facts: Cyclone Idai's effect on southern Africa*. https://europe.mercycorps.org/en-gb/blog/cyclone-idai-facts

Mixed Migration Centre. (2023). *Climate and mobility case study: Beira, Mozambique: Praia Nova*. https://mixedmigration.org/wp-content/uploads/2023/01/259_Case_Study_3_Mozambique.pdf

Mucova, S. A. R., Azeiteiro, U. M., Filho, W. L., Lopes, C. L., Dias, J. M., & Pereira, M. J. (2021). Approaching sea-level rise (SLR) change: Strengthening local responses to sea-level rise and coping with climate change in Northern Mozambique. *Journal of Marine Science and Engineering, 9*(2), 205.

Municipality of Beira. (2019). *Beira municipal recovery and resilience plan: A roadmap to building Beira back better* (Vol. 1). https://www.dutchwatersector.com/sites/default/files/2019-06/Summary%20Beira%20Municipal%20Recovery%20and%20Resilience%20Plan.pdf

ND-GAIN. (2025). *Notre Dame Global Adaptation Initiative: Rankings*. https://gain.nd.edu/our-work/country-index/rankings/

Nhamo, G., & Chikodzi, D. (2021). *Cyclones in Southern Africa. Volume 1: Interfacing the catastrophic impact of cyclone Idai with SDGs in Zimbabwe*. Cham: Springer.

Norton, R., MacClune, K., & Szonyi, M. (2020). *When the unprecedented becomes precedented: Learning from Cyclones Idai and Kenneth*. Zurich: Zurich Flood Resilience Alliance.

Office for the Coordination of Humanitarian Affairs (OCHA) (2019a). *6 months after cyclone Idai: farmers are fainting in fields because of hunger – Mozambique. 6-10*. https://reliefweb.int/report/mozambique/6-months-after-cyclone-idai-farmers-are-fainting-fields-because-hunger

Office for the Coordination of Humanitarian Affairs (OCHA) (2019b). *2019 Zimbabwe flash appeal, January*. https://reliefweb.int/report/zimbabwe/2019-zimbabwe-flash-appeal-january-june-2019-revised-following-cyclone-idai-march

Office for the Coordination of Humanitarian Affairs (OCHA) (2019c). *Humanitarian response plan Mozambique 2018-2019*. https://reliefweb.int/sites/reliefweb.int/files/resources/ROSEA_20190325_MozambiqueFlashAppeal.pdf

Office for the Coordination of Humanitarian Affairs (OCHA) (2019d). *Mozambique: Cyclone Idai & floods situation report – 20th May 2019*. https://reliefweb.int/report/mozambique/mozambique-cyclone-idai-floods-situation-report-no-22-20-may-2019

Palalane, J., Larson, M., Hanson, H., & Juízo, D. (2016). Coastal erosion in Mozambique: Governing processes and remedial measures. *Journal of Coastal Research, 32*(3), 700-718.

Platform on Disaster Displacement (PDD). (2015). *The Nansen Initiative - Agenda for the protection of cross-border displaced persons in the context of disasters and climate change*. https://disasterdisplacement.org/

Platform on Disaster Displacement (PDD) (2025). *Disaster displacement and disaster risk reduction: Platform on disaster displacement.* https://disasterdisplacement.org/resource/policy-brief-disaster-displacement-and-disaster-risk-reduction/

Raimundo, I. M. (2009). International migration management and development in Mozambique: What strategies? *International Migration, 47*(3), 93-122.

Raimundo, I. M. (2021). *International migration dynamics in Mozambique and natural resource exploration: Gold and forest predation.* http://www.tufs.ac.jp/asc/ASC-TUFS_WP_01_273-299raimundo_web.pdf

Raimundo, I. M., & Chikanda, A. (2016). *Informal entrepreneurship and cross-border trade in Maputo, Mozambique.* SAMP Migration Policy Series No. 73.

Santos, M. M., Ferreira, A. V., & Lanzinha, J. C. G. (2023). The possibilities of capturing rainwater and reducing the impact of floods: A proposal for the city of Beira, Mozambique. *Sustainability, 15*(3).

Serele, C., Kouadio, M., & Kayitakire, F. (2023). Mitigating proximate impacts of tropical cyclone landfalls in the Southwest Indian Ocean. *Western Indian Ocean Journal of Marine Science, 22*(2), 147-161.

Southern African Development Community (SADC) (2005). *Protocol on the facilitation of the movement of persons.* https://www.sadc.int/document/protocol-facilitation-movement-persons-2005

Southern African Development Community (SADC) (2019). *SADC regional humanitarian floods appeal in response to tropical cyclone Idai*. https://reliefweb.int/report/mozambique/sadc-regional-humanitarian-floods-appeal-response-tropical-cyclone-idai-enpt

Spiegel, S. J., Kachena, L., & Gudhlanga, J. (2023). Climate disasters altered migration and pandemic shocks: (im) mobilities and interrelated struggles in a border region. *Mobilities, 18*(2), 328-347.

Sunu, N. E. (2024). Assessing differences in household food insecurity vulnerabilities post-Cyclone Idai in Beira, Mozambique [Unpublished Doctoral dissertation]. University of Waterloo. http://hdl.handle.net/10012/20631

Sunu, N. E., McCordic, C., & Frayne, B. (2025). "If we didn't have anything, not even pots to cook, how do we help each other?": A qualitative analysis of social capital networks and household food access post-cyclone Idai in Beira, Mozambique. *International Journal of Disaster Risk Reduction, 124*, 105549.

Tadgell, A., Doberstein, B., & Mortsch, L. (2018). Principles for climate-related resettlement of informal settlements in less developed nations: a review of resettlement literature and institutional guidelines. *Climate and Development, 10*(2), 102-115.

United Nations Children's Fund (UNICEF) (2019). *Massive flooding in Mozambique, Malawi and Zimbabwe*. https://www.unicef.org/stories/massive-flooding-malawi-mozambique-and-zimbabwe

United Nations Development Program (UNDP) (2023). *Multidimensional Poverty Index 2023. Unstacking global poverty: data for high impact action, Mozambique.* https://hdr.undp.org/mpi-2023-faqs

United Nations Development Program (UNDP) (2024). *Climate finance in Africa: An overview of climate finance flows, challenges and opportunities*. *https://www.undp.org/africa/publications/climate-finance-africa-overview-climate-finance-flows-challenges-and-opportunities*

UNDP, & UN-Habitat. (2022). *Smart urban resilience in Sub-Saharan Africa*. https://www.undp.org/africa/events/africities-2022-smart-urban-resilience-sub-saharan-africa

UN-Habitat. (2020). *Financing for Resilient and Green Urban Solutions in Beira, Mozambique*. https://unhabitat.org/sites/default/files/2020/02/the_frugs_city_study_report_on_beira_mozambique_1.pdf

United Nations Office for Disaster Risk Reduction (UNDRR) (2019a). *Disaster displacement: how to reduce risk, address impacts and strengthen resilience*. https://www.undrr.org/words-into-action/disaster-displacement-how-reduce-risk-address-impacts-and-strengthen-resilience

United Nations Office for Disaster Risk Reduction (UNDRR) (2019b). *Global assessment report on disaster risk reduction.* https://gar.undrr.org/

United Nations Office for Disaster Risk Reduction (UNDRR) (2023). *Building disaster resilience: A study of disaster events and financial lending streams.* https://reliefweb.int/report/world/building-disaster-resilience-study-disaster-events-and-financial-lending-streams

United Nations Office for Disaster Risk Reduction (UNDRR) (2025). *Mozambique bridges disaster risk reduction and internal displacement strategies to strengthen inclusive risk governance*. https://www.undrr.org/resource/case-study/mozambique-bridges-disaster-risk-reduction-and-internal-displacement-strategies

United Nations Environment Program (UNEP) (2020). Law No.10 / 2020 approving the Disaster Risk Management Act. *UNEP-LEAP, 10*, 102020. Decree No. 76/2020 approving the Regulation of the Disaster Risk Management Act.

United Nations High Commissioner for Refugees (UNHCR) (2019a). *Factsheet: Cyclone Idai*. https://reliefweb.int/report/mozambique/unhcr-mozambique-factsheet-cyclone-idai-june-2019

United Nations High Commissioner for Refugees (UNHCR) (2019b). *Update on achievements in the operational context.* https://reliefweb.int/report/mozambique/tropical-cyclone-idai-unhcr-response-mozambique-malawi-and-zimbabwe-may-2019

UN SDGs. (2016). *Final list of proposed Sustainable Development Goal targets & indicators*. https://sustainabledevelopment.un.org/content/documents/11803Official-List-of-Proposed-SDG-Indicators.pdf

United Nations Office for Disaster Risk Reduction (UNISDR) (2015). *Sendai Framework for Disaster Risk Reduction 2015-2030.* https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030

United Nations Office for Disaster Risk Reduction (UNISDR) (2017). *UNISDR annual report 2017: 2016-17 Biennium Work Program Final Report.* https://www.gacd.org/perch/resources/downloads/gacd-annual-report-20177mb.pdf

United States Agency for International Development (USAID) (2021). *Mozambique smallholder farmer production and productivity activity (MSFPPA).* https://www.usaid.gov/mozambique/fact-sheets/mozambique-small-holder-farmer-production-and-productivity-activity

Wiles, P. (2005). *Learning lessons from disaster recovery: The case of Mozambique*. http://www.recoveryplatform.org/assets/publication/mozambique.pdf

World Bank. (2017). *Mozambique urbanization review: Accelerating urbanization to support structural transformation in Mozambique*. Washington, DC: World Bank. https://openknowledge.worldbank.org/entities/publication/022aaeed-8bde-5358-9f8e-0379e7fc3bf6

World Bank. (2019). *Restoring Zimbabwe's livelihoods, infrastructure after Cyclone Idai*. https://www.worldbank.org/en/news/feature/2019/09/16/restoring-zimbabwes-livelihoods-infrastructure-after-cyclone-idai

World Bank. (2021a). *Millions on the move in their own countries: The human face of climate change*. https://www.worldbank.org/en/news/feature/2021/09/13/millions-on-the-move-in-their-own-countries-the-human-face-of-climate-change

World Bank. (2021b). *Poverty & equity brief Mozambique.* April. https://databankfiles.worldbank.org/public/ddpext_download/poverty/987B9C90-CB-9F-4D93-AE8C-750588BF00QA/SM2021/Global_POVEQ_MOZ.pdf

World Bank. (2025). *Climate risk country Profile: Mozambique*. https://climateknowledgeportal.worldbank.org/sites/default/files/country-profiles/17258-WB_Mozambique%20Country%20Profile-WEB.pdf

World Risk Report. (2024). *World risk report 2024 – Focus: Multiple crises.* https://reliefweb.int/report/world/worldriskreport-2024-focus-multiple-crises

World Meteorological Organization (WMO) (2024). *Africa faces disproportionate burden from climate change and adaptation costs.* https://wmo.int/media/news/africa-faces-disproportionate-burden-from-climate-change-and-adaptation-costs

Yu, P., Johannessen, J. A., Yan, X. H., Geng, X., Zhong, X., & Zhu, L. (2019). A study of the intensity of tropical Cyclone Idai using dual-polarization Sentinel-1 data. *Remote Sensing, 11*(23), 2837.