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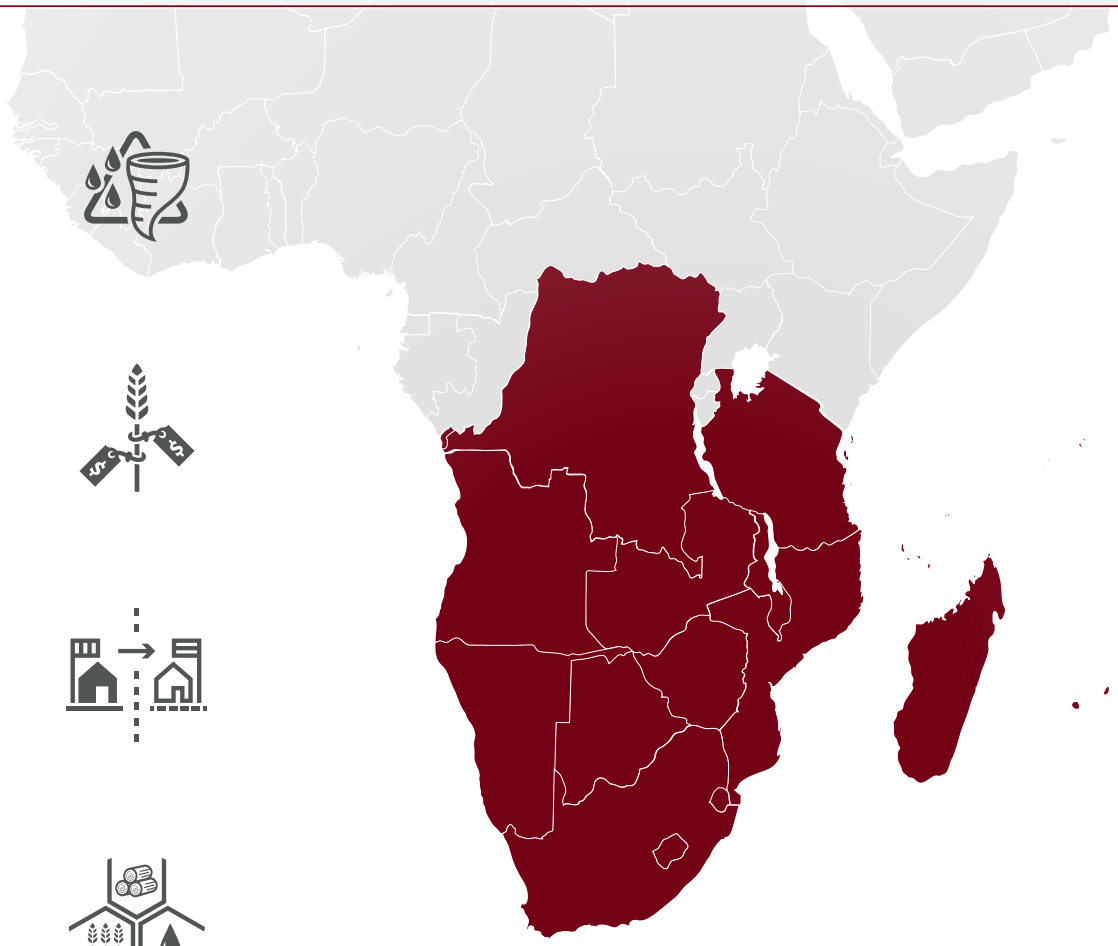

CLIMATE-FRAGILITY RISK BRIEF

SOUTHERN AFRICA

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CLIMATE SECURITY EXPERT NETWORK

CLIMATE-FRAGILITY RISK BRIEF: SOUTHERN AFRICA

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OVERVIEW

Southern Africa is famous for its rich nature and biosphere, diverse and vibrant cultures, and numerous world-renowned natural sites. However, the region is also affected by political fragility and high levels of inequality and human insecurity. Moreover, in the past years, the climate crisis has become one of the most pressing common challenges, cutting across national borders and increasingly leading to events with drastic socio-economic consequences for the regional population. Most frequent are floods caused by heavy rainfalls (UNFPA 2015), while at the same time droughts have resulted in severe economic and biodiversity losses and have affected large proportions of the regional population (CIWA 2021). In some areas, storms resulting from tropical cyclones have led to damages and displacement (SADC n.d. b). All of these climate-related events have directly or indirectly impacted livelihoods, economic prosperity, health, and increased vulnerability due to diseases, extreme heat, or famine (CIWA 2021).

Like in other parts of Sub-Saharan Africa, insecurity and violence in the southern parts of the continent are likely to be compounded by climate change in the near future (Scheffran et al. 2019). While climate change is not a direct cause of conflict, it can exacerbate existing security risks and trigger violent tensions (Detges et al. 2020). The confluence of several climate stressors such as increasing temperature, floods, droughts, and other extreme weather events poses significant risks to Southern Africa and needs to be sufficiently and efficiently addressed as such. Responses must factor in climate security analysis and dynamics based on existing evidence to better prepare for, or prevent, looming risks.

The countries that comprise Southern Africa vary, but for the purpose of this analysis, we consider the 16 member states of the Southern African Development Community (SADC) Angola, The Comoros, Botswana, the Democratic Republic of the Congo (DRC), Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, The Seychelles, South Africa, Tanzania, Zambia, and Zimbabwe (SADC n.d. a). Together, these countries account for 30% of Africa's land area and an estimated population of 363.2 million people (Migration Data Portal 2021; Wikipedia 2021).

This climate-fragility risk brief offers a concise overview of the climate security situation in Southern Africa. It maps the varying climate impacts and associated security risks, as well as key conflict dynamics. The threats posed by climate change to long-term peace and stability in Southern Africa include:

- Slow- and sudden-onset climate disasters trigger forced migration due to food and livelihood insecurity.
- Climate-induced disasters reduce biodiversity and destroy infrastructure, thereby threatening livelihoods and increasing vulnerability, which in turn can lead to, or compound, social unrest and instability.
- Sea-level rise and marine disaster and disruption threaten mainland coastal communities and island states, impeding opportunities for economic growth and spurring migration.

These threats however are not inevitable: If the right measures and policies are put in place, they can be addressed and averted.

Given the cross-border implications of climate-related impacts, coordination and collaboration are essential. This has been recognized by SADC as key to regional prevention, mitigation, and adaptation programmes and policies (SADC n.d. c).

This climate-fragility risk brief suggests several concrete actions to specifically address the security risks presented by climate change:

- Strengthen the institutional capacities and ownership of SADC and other regional actors, including strategic foresight and early warning systems for climate-related security risks.
- Reinforce existing mitigation strategies such as the SADC Climate Change Strategy and Action Plan.
- Enhance mitigation strategies by conducting regional and national climate-fragility risk assessments across all sectors and improve cooperation to overcome silos, supporting sustainable and efficient responses to climate-security risks.
- Identify climate security needs based on locally-informed analysis with regional experts and research institutes, and integrate them further into the mandates and programmes of international, regional, national, and local organisations.
- Socially and economically empower vulnerable groups. Deepen engagement with civil society in the design of adaptation programs to improve adaptation strategies and enhance resilience.
- Policy-making actors should take forward an agenda that considers preventative and climate risk mitigation efforts and adequate funding allocation.
- Socio-economic stressors that are exacerbated by climate change and related disasters should be addressed in order to build resilience and in light of sustainable urban development.

SOCIO-ECONOMIC, DEVELOPMENT AND SECURITY CONTEXT

Southern Africa comprises 16 countries, reaching from the northern tip of the Democratic Republic of Congo (DRC) to the southern-most point of South Africa. Totalling an area of 556,781km2, it is as geographically diverse as its populace. Plateaus, uplands, coastal mountains and plains, escarpments, islands and mainland are all present in the region. Ground cover varies too, including desert, dense forest, and vast expanses of scrub and grasslands, as well as large rivers and drainage basins. Given the differences in geography, the region's climate is varied, ranging from arid to semi-arid, temperate to tropical. The region does share a few common climate-related traits however; higher temperatures, droughts - most recently from 2016 to 2019 - flooding, storms and wildfires are issues frequently affecting diverse swathes of the region. As the climate continues to change rapidly, these issues are only expected to get worse. Further, given that many livelihoods are dependent on the sustainability of land and water, a changing climate poses considerable risk to livelihoods and broader development in the region.

Natural resources are abundant, with the region boasting an impressive array of mineral deposits in particular. The world's largest platinum reserves are found in Southern Africa, along with platinum group elements and other valued minerals, such as gold, copper and diamonds. Many of the minerals that will drive the low carbon transition are found here too, and given the scale and number of these deposits, the region has the potential to be a key market for economic growth and expansion (UNU-WIDER 2017). Few countries have successfully exploited this opportunity however, with South Africa being one of only a few to establish the legal mechanisms and infrastructure needed to truly capitalise on these resources. Though an important, and growing, economic driver for several other economies, issues around governance and predation, resource management, and poor infrastructure ensure potential gains from the sector remain broadly unrealized.

Social and Demographic Context

Southern Africa's population is estimated to be around 363.2 million (2021), with the majority (58%), as of 2015, being under the age of 25 (SADC 2020e). Differences in population within countries is immense however: for example, the DRC had a population of around 90 million in compared to Comoros' around 900 thousand 2020 (Simkins, 2021). Spatial and population diversity is accompanied by a rich tapestry of ethnic groups, including Xhosa, Zulu, Shona and Tsonga (to name a few). Two language families dominate however, Bantu and Khoisan. Further, as a result of colonialism, which began at scale in the 17th century, the region includes a native European population as well, with a sizable minority in South Africa and Zimbabwe. Other groups, both free persons and traders, and indentured slaves brought by European settlers, particularly of Asian descent, have also long settled in the region (Seedat-Khan and Johnson 2018).

Unfortunately, diversity between and within the countries' socio-economic development is also stark. Firstly, the region incorporates both resource and export rich countries, such as South Africa, Namibia, and Angola, and extremely poor countries, where severe poverty and a lack of goods negatively affect the health and wellbeing of populations. As a result, some SADC countries have relatively high Human Development Index (HDI) scores (Mauritius: 0.804, rank 66), whereas others rank very low (Madagascar: 0.528, rank 164) (AGRICA n.d.; UNDP 2021). With that said, economic disparity and inequality exist at extremely high levels within all countries, with poverty, unemployment, poor health and education being consistent regional challenges regardless of a country's level of development. Indeed, neither resource-rich countries, such as Angola, Namibia, or South Africa, nor mostly agriculture-based economies, such as Malawi, have been able to notably reduce wealth gaps or unemployment rates (ILO 2013). Further, inequality and poverty are on the rise, especially in countries facing political crises, such as Eswatini and Zimbabwe (SADC, 2020b) and are contributing to instability. Countries with racial minorities face significant racial inequality too; In South Africa for example, white South Africans own over 72% of the country's land but make up only 5% of the total population (South African Government 2017).

The high levels of inequality between and within states has exacerbated an issue already compounding stressors: migration. High levels of unmanaged migration, either within states or between them, can further feed inequality due to government antipathy towards migrants and their accompanying policies, including deterrent or punitive measures (Mbiyozo 2019), leading many to fall into the same cycles of poverty regardless of their geographic location. This point is particularly pressing for foreign migrants who, given their lack of documentation, are in effect "stateless", which inhibits their ability to access important government resources. Zimbabwe, South Africa, Madagascar, and the DRC are among the nine African countries with the biggest stateless populations.

Climate change will likely contribute to migratory pressures as livelihoods, which are disproportionately linked to agriculture and food systems, remain vulnerable and food systems are continuously affected by drought (Migration Data Portal 2021). Water stress and shortages have been identified as central reasons for migration (Ionesco et al. 2016), and over the last five years, extended periods of severe droughts have had widespread impacts and heightened existing vulnerabilities such as poverty and limited access to food (IDMC 2019; Chikohomero 2020). Left unchecked, this cycle of poverty and inequality will only continue.

Poverty and marginalization remain high for other vulnerable groups too, namely women and youth. Though some SADC countries have undertaken efforts to enhance gender equality, women continue to be widely excluded from political participation, decision-making processes, as well as educational, and economic opportunities (SADC n.d. e). They also suffer from higher levels of poverty and lower literacy levels than men (Nyahunda et al. 2019). Furthermore, girls, young women, and women belonging to certain ethnic groups are impacted by “intersecting horizontal inequalities” (UNDP 2021; USAID 2020). Women in rural areas or women among Internally Displaced Persons (IDPs) bear the brunt of the socio-economic impact of climate change as they often engage in livelihoods that are sensitive to climate-related hazards and have less adaptive capacities (Kanem and Lowcock 2020). The gender-based barriers to access land, social capital, financial services, and technology make women more vulnerable to food insecurity and climate-related impacts (UNDP 2012). Male youths themselves face considerable challenges entering the workforce, which is reflected in regional unemployment rates. These rates range from 10% in Tanzania to 57% in South Africa.

Poverty, racism, marginalization, and economic inequality within and between states, exacerbated by globalization and the adverse effects of climate change, are key contributors to human insecurity in Southern Africa (Cawthra 2008). Together, these challenges contribute to the region being designated as one of the most unequal in the world (UNDP 2019).

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Economic Context

SADC member states' combined Gross Domestic Product (GDP) is USD $721.3 Billion (African Development Bank 2018; SADC n.d. e). The service sector accounts for 59.4% of GDP, 20.3% belongs to industry and 20.2% to agriculture. In the preceding ten years to 2018, the GDP growth rate slowed from 6.8% annualized growth in 2007 to 2.1% in 2017. The rate of decline began with the 2008 financial crisis, and though aggregate figures are not yet available, the COVID-19 pandemic and resulting global economic shutdown mean this decline is likely to have continued. For the average person, the COVID-19 pandemic and various containment measures have disrupted livelihoods, increased food insecurity, and decreased income-generating opportunities (USAID 2021). Worse, of all participants in the economy, the livelihoods of the urban poor were most acutely impacted due to their participation in the informal sector. Even though countries have excess exportable cereal, grain, and other agricultural goods and fish stock, lockdowns and supply chain issues further increased food insecurity.

BOX: Impacts of Covid-19

In five countries of the region, the adverse economic effects of COVID-19 restrictions contributed to a sharp rise in the number of people in IPC (Integrated Food Security Phase Classification) Phase 3 or above, which corresponds to crisis or emergency levels of food insecurity (FSIN and Global Network Against Food Crises 2021). In the DRC, 33% of inhabitants, 22 million people, experienced IPC phases 3 and above in the second half of 2020. During the February–June 2020 lean season, the number of people in IPC Phase 3 or above in rural Zimbabwe increased by 21%. Nearly 2.7 million people experienced IPC Phase 3 or above in Mozambique in October–December 2020, which was 60% higher than the 2019 lean season. In Cabo Delgado, the situation was especially concerning with over 579 000 people caught in devastating humanitarian crisis (ibid). Already in 2019, Angola, Botswana, Namibia, and Zimbabwe declared a state of emergency due to looming drought in their respective countries (IFRC 2020). Food insecurity also led to severe malnutrition of children in 2020 in Angola, DRC, Mozambique, South Africa, Tanzania, and Zambia (SADC 2020; WFP 2021a).

The region is home to a large rural and semi-rural population, as well as nomadic communities. Rural and nomadic communities rely on livestock, and in coastal areas, fisheries and aquaculture are key sources of income (Scheffran et al. 2019). Over 40% of the region´s land is used for cereal farming, with maize being the predominant crop, followed by millet (Namibia), paddy rice, sorghum (Mozambique), and wheat (South Africa) (USAID 2016). Over the last decades however, the production of cereals in the region has stagnated, while the population of the region has increased by 40%. This puts additional pressure on food supplies and highlights why ensuring stable or predictable climatic conditions as well capacities to adapt to climate change are central to economic stability and health (Cawthra 2008). Unfortunately, the ill-effects of COVID-19 restrictions, reduced productivity and increased populations is currently affecting populations in the region: the number of people experiencing crisis or emergency levels of food insecurity is 40.2 million (FSIN and Global Network Against Food Crises 2021).).

Within the next 60 years, Namibia, Botswana, and South Africa will likely no longer be able to grow enough cereal crops for their population and will face increasing food insecurity (Migration Data Portal 2021).

Compounding this issue is the region's poor transportation infrastructure, which is generally good in urban areas, while rural districts remain poorly accessible. This means that rural and urban food producers often lack access to markets, and food transportation to areas of food insecurity is difficult, perpetuating food insecurity issues especially in times of crisis (Hachigonta et al. 2013).

In the past, tourism had been a central driver of the regional economic and social development: Tourist arrivals in the SADC region had grown from 20.6 million in 2006 to 21.5 million in 2010 and generated USD 12.76 billion in 2009. In 2010 the sector accounted for 1.92 million jobs in the region. The tourism sector offered fast entry into the workforce for low-skilled and semi-skilled workers, and was thus an important employment generating activity, especially for women (Nyaruwata and Shepherd2013). However, changes in ecosystems and biodiversity, due to human development and climate change, have negatively impacted the largely nature-based tourism industry across the region. Amongst others, flood risks and water-pollution-related diseases in low-lying regions (coastal areas), as well as coral reef bleaching and the decrease of species variety or their extinction are making tourist destinations less attractive (Boko et al. 2007, Davis 2011).

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Security Context

The region continues to be susceptible to largely internal, isolated armed conflicts and violent tensions, though the possibility for transnational conflicts is acute. In recent years, armed conflicts reoccurred in both Mozambique and Angola, with ongoing violence by armed non-state groups occurring in eastern DRC (Nordic Africa Institute 2018). Recently, violence in northern Mozambique, perpetrated by armed extremist insurgents is intensifying in scope, complexity, and scale, and will most likely increase humanitarian needs and displacement. Consequently, cross-border attacks from northern Mozambique into southern Tanzania could escalate (OCHA 2021). Insurgencies, like the one in Mozambique, are largely exploiting local grievances, mistrust in the state, and a lack of economic opportunities, especially among male youth (Okunade et al. 2020). Given the broad political, economic and social instability present within many of the regions' states, insurgencies and their exploitation of grievances are increasing in frequency. In 2019, there were more than 160 attacks by insurgent groups, compared with 60 in 2018 and six in 2017 (Omar 2020). Between Covid-19 and increasing climate stress, these groups are likely to continue their recruitment and activities (Cronjé 2020).

Acute crises in the SADC region are often sparked by issues of governance, including electoral stalemates, authoritarian rule, deficient accountability of state institutions, and the abuse of state resources in attempts to keep power (The Nordic Africa Institute 2018). Governance deficits and limited provision of public services constitute an immediate threat to peace and security in the region, additionally limiting required resource management and the capacity to adequately cope with or prevent impacts of climate change.

BOX: Recent insecurities across the region

In mid-2021, the Kingdom of Eswatini experienced violent clashes between demonstrators and security forces. The unrest was triggered by demonstrations calling for democratic reforms of the country, followed by demands for improved economic prospects and an end to brutal government-led crackdowns (Trouillard 2021). In South Africa, the sentence for contempt of court imposed on former president Jacob Zuma led to outbreaks of violence and looting in July 2021. The tensions relate, however, to several root causes, such as poverty and inequality, that built up discontent over time (Pietromarchi and Usaid, 2021; Malik 2021). South Africa´s unemployment rate is the highest worldwide and differences between income levels, food security, living standards, and access to governmental services within the country are very high. Some parts of the country and even within a same city do not have regular access to water and power – partially also as a result of climate change and new migration patterns. Furthermore, the global COVID-19 pandemic added additional challenges, exacerbating poverty and inequalities. Police violence and wide-spread corruption are a major problem in the country as well (Economist 2021). In Mozambique, cyclones increasingly pose threats to communities, with existing and increasing violence in the Cabo Delgado province adding an additional layer of vulnerability by internal displacements, food and livelihood insecurity. In April 2021, food insecurity was especially problematic in the provinces of Cabo Delgado, Nampula, Niassa, and Zambezia: 950,000 people were facing severe hunger and 750,000 were internally displaced at this time (WFP 2021c).

Scarcity of vital resources is an increasing conflict-compounding factor too: In drought-impacted countries, such as Namibia, Botswana, and South Africa, access to water is increasingly causing (violent) tensions. Additionally, land management, as well as distribution of and access to fertile land, continue to be triggers of conflicts, as can be observed particularly in Zimbabwe, South Africa, and Namibia (Cawthra 2008).

Regional cooperation is mainly driven by economic and security interests, and is largely led by SADC. The organisation was born following Zimbabwe's independence in 1980, first as the Southern African Development Coordination Conference (SADCC) then as the contemporary SADC following South Africa's movement towards democracy in the 1990s. The aim of the organisation is to promote, among other objectives, economic integration across the region (Cawthra 2008). The organisation also pursues a political and security agenda, and has a mutual defence and nonaggression pact, a comprehensive treaty of security cooperation, a combined SADC standby brigade for peace support operations, and a Regional Peace Keeping Training Centre to coordinate peace support training in the SADC region (SADC n.d.f). Further, SADC member countries actively contribute to the UN and African Union peace support operations. Their contributions include military observers, civilian police, and "blue helmets" (SADC n.d. f). In the face of a need to coordinate a response to climate stressors, the SADC could play a key role in facilitating adequate and appropriate, cross regional response to threats posed by climate change.

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UN presence in the region:

Country/Region	Mission	Mandate
DRC	United Nations Organisation Stabilization Mission in the Democratic Republic of the Congo (MONUSCO)	In 2010, MONUSCO took over from an earlier UN peacekeeping operation, in accordance with Security Council resolution 1925, to reflect the new phase reached in the country. MONUSCO is authorized to use all necessary means to carry out its mandate, including the protection of civilians, humanitarian personnel, and human rights defenders under imminent threat of physical violence. It also supports the Government of the DRC in its stabilization and peace consolidation efforts (MONUSCO n.d.).
Mozambique	Personal Envoy for Mozambique	In 2019, UN Secretary-General Antonio Guterres named Ambassador Mirko Manzoni (Switzerland) as his Personal Envoy for Mozambique. In this role, Mr. Manzoni provides good offices support in facilitating the dialogue between the Government of Mozambique and opposition RENAMO towards the signing and subsequent implementation of a peace agreement between the parties (UNDPPA 2019).
African Great Lakes	Special Envoy for the Great Lakes	In 2013, 13 nations signed the Peace, Security and Cooperation (PSC) Framework for the DRC and the region to end the recurring cycles of conflict in eastern DRC, which impacts stability and development in the Great Lakes area more broadly. It provides space for collaboration between the countries and organizations in the region, and the international community to work together and address the structural causes of instability in the DRC and the region. The mandate includes undertaking good offices to strengthen relations between the signatories, foster agreements to revitalize the implementation of existing accords that promote regional economic integration, and promote the free movement of goods and people (Office of the United Nations Special Envoy for the Great Lakes n.d.)

CLIMATE CONTEXT

Current Climatic Situation, Climate Vulnerability and Projections

Southern Africa is considered a potential "climate vulnerability" hotspot by the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC 2020). Vulnerability stems in part from the rate of temperature change and future projections to 2100: temperatures are increasing faster than worldwide averages, and projections point to further increases, ranging between 2°C and 5°C by 2100 (New et al. 2020). Temperature changes impact weather patterns, which in turn interrupt food systems and exacerbate natural disasters, compounding food insecurity and contributing to poor health and lost livelihoods. Low income levels within already politically, economically and socially vulnerable states compound vulnerability further. Rising temperatures can further strain already fragile human, financial, and social capital needed to deliver appropriate adaptation and mitigation efforts. Accordingly, climate change will be a significant risk amplifier for the region in the coming years.

The impacts of climate change ultimately vary among geographic areas within southern Africa. However, they are broadly framed as either direct or indirect according to the varying degrees of consequences. Direct impacts include damages to transport infrastructure, displacement, reductions of crop yields, and death of people and livestock. Indirect impacts include increasing health burdens, such as a rise in cholera cases following heavy rains, and malnutrition following drought, flooding, and pests, and the related loss of livelihoods that provoke poverty (my climate n.d.). Indeed, temperature increases and more extreme weather events can deprive people of their livelihoods, in part due to deteriorating crops or silting of rivers in areas where people are dependent on agriculture, aquaculture, and livestock (Cattaneoa and Peri 2016). The degree to which climate change impacts a country depends on the actual exposure to the hazard itself, the biophysical vulnerability, and the adaptive capacity and social vulnerability (Davis 2011).

Climate projections: Southern Africa

Projected increase in temperature between 2°C - 4.2° C by 2100

More extreme weather, with intense precipitation and floods

Rainfall changes uncertain, but likely slightly drier conditions on average

Key climate impacts

Agriculture
- Increased crop losses/failure More pests, weeds, and pathogens

Water
- Increased variability of flows Reduced water quality Salinization of coastal aquifers

Human Health
- Changing distribution of vector-borne diseases More death/ illness from extreme events

Ecosystems
- Changes in species composition Increased degradation/ deforestation Altered fire regimes

Infrastructure
- Damage to roads, bridges, etc. Reduced efficiency of flood protection mechanisms

Energy
- Increased cost and revenue losses Changing seasonal energy demands Reduced hydropower generation

Source: USAID 2016, adapted by adelphi

Nonetheless, in recent decades, meteorological, hydrological, and climatological climate hazards have taken a heavy toll on the region (Mbiyozo 2021; Pandey 2019). In particular, the increasing frequency of natural disasters has led to repeated destruction and disruption of livelihoods, affecting the lives of millions of people (Red Cross and Red Crescent Climate Centre 2019). Climate change has also compounded the humanitarian impacts of other factors, such as Covid-19 (USAID 2021). In the near future, the region is expected to face more floods, storms, droughts, and wildfires (OCHA 2021).

Pressures on food systems remain a key climate vulnerability regionally. Higher temperatures and inconsistent rain patterns mean net crop yields are becoming more unpredictable: Cereal crops, including maize, rice, wheat, sorghum, and millet, are particularly vulnerable to heat. This implies that climate change increases food insecurity and threatens livelihoods. Without surplus grain to feed livestock, compounded by reduced and late rainfall, livestock are being impacted by the quality of feed, as well as by a potential increase in the spread of diseases and limited availability of water (USAID 2016). Livestock farmers and pastoralists in the region therefore experience losses due to animal starvation and disease, and the early culling of herds forced by water and feed shortages. Another result is the severe decrease of wildlife and biodiversity (Mogoatlhe 2019; NASA Earth Observatory 2019).

Climate-related changes in temperature and precipitation have negative impacts on human health too, reversing public health gains made in the last ten years. Poor waste management practices, inadequate drinking water and sanitation, restricted access to health care facilities, scarce financial resources, and poor governance pose multiple health hazards, including malnutrition, diarrheal disease, malaria, and other vector-borne diseases (USAID 2016). Reduced water quality and quantity due to changing rainfall patterns lead to altered distribution of vector- and waterborne diseases, as well as increased urban migration in search of basic services. Accordingly, in combination with increased frequency, duration, and intensity of extreme weather events, especially vulnerable populations suffer from worsened health conditions, malnutrition and an increase in fatalities (ibid).

Further, climate disasters and extreme weather events are expected to worsen, exacerbating multifaceted vulnerabilities of populations. Already, from 1980 – 2015, southern African countries experienced 491 recorded climate-disasters, resulting in 110,978 deaths, affecting around 140 million people, and leaving 2.47 million people without a home (Davis-Reddy and Vincent 2017). The four major types of climate-related disaster events in southern Africa are storms, floods, droughts, and wildfires (USAID 2016).

Rising temperatures contributed to an increased frequency of extreme weather events and the Sub-Tropical Eastern Continental Moist Maritime System causes regular and more frequent cyclones (Voosen 2020). Since 2000, seven tropical cyclones hit Southern Africa: Eline (2000), Favio (2007), Dineo (2017), Idai (2019), Kenneth (2019), Eloise (2021), and Chalane (2020) (Chingono 2020).

Floods have tended to be the most frequent form of climate-related disaster, with two extensive periods of flooding occurring 10 years apart. In 2009, extensive flooding in the Caprivi strip bordering Angola, Namibia, and Zambia resulted in the displacement of over 50,000 people after a period of drought (Government of Namibia 2010). In 2020, incessant rains led to floods across different countries in Southern Africa, particularly in Mozambique, Zambia, and Zimbabwe, and significantly affected crops and livestock, threatening livelihoods and food security (Celestial 2020). Droughts, however, have resulted in the highest economic cost in damages and have affected a larger proportion of the region's population (FAO 2004). Between 1980 and 2015 an estimated 107 million people (37% of the SADC population) were affected by droughts, compared to an estimated 21 million people (7.6% of the SADC population) affected by floods.

Wildfires are also more frequent and damaging. In March 2015, an estimated 57,000 people were affected by wildfires in and around Cape Town, South Africa. Windy and dry conditions, in combination with high temperatures of 42°C resulted in a fire that burnt around 4,000 hectares of vegetation (Davis-Reddy and Vincent 2017). In June 2016, widespread fire was observed over the southern region of the Democratic Republic of Congo, Zambia and Angola. Due to agricultural burning practices, the main fire season in these regions occurs between June and July (ibid).

BOX: Impacts of cyclones

In 2019, Cyclones Idai and Cyclone Kenneth, two unusually powerful storms, were among the world's biggest disasters. Cyclone Kenneth is considered the strongest to have ever hit Africa (CRED 2020). The impacts of these cyclones were exacerbated by heavy rains in early 2020, which hampered efforts to return displaced people and provide them with sufficient humanitarian aid. Today, millions are still in need of support to rebuild their livelihoods. The UN estimates that in Mozambique alone, 2.5 million people require humanitarian assistance due to cyclones, drought, and flooding (IOM 2020). Cyclone Kenneth also hit the Comoros exceptionally hard, destroying about 4,600 homes and worsening the humanitarian situation of thousands in already poor and vulnerable conditions on the islands. Around 19,000 disaster-related displacements were recorded, and damages and losses were estimated at USD 185 million, with the cost of recovery and reconstruction expected to be up to USD 277 million (World Bank 2019).

Similarly, Cyclone Idai also struck Malawi and triggered around 110,000 displacements in the southern parts of the country. In Zimbabwe, mainly in the Eastern rural districts of Chimanimani and Chipinge, 51,000 people were displaced by Idai. Furthermore, the cyclone destroyed an estimated 1.4 million hectares of arable land – about 33% of national agricultural production. This meant that 50,000 mainly smallholder farmers lost their livelihoods and extensive crop losses exacerbated high levels of malnutrition (Chingono 2020).

POLICY AND INSTITUTIONAL CONTEXT

Regional policy and institutional response is largely coordinated by SADC, which has identified climate change as a significant threat to the region (SADC n.d.b). Addressing climate change is thus a key priority for SADC member states, not least because of the direct and indirect impact it has/will continue to have on them (ibid). Climate change adaptation features in a number of key SADC initiatives. Coordinated through SADC and implemented at national levels, disaster risk management initiatives can help reduce the costs of the impacts induced by extreme weather events. This reflects a large body of evidence suggesting that investment in disaster prevention is more cost- effective than spending on relief (SADC 2015).

Opportunities for cooperation across the region include transboundary water management, disaster risk reduction, early warning systems and the regional economy and trade relations (SADC n.d. b). Some examples for joint water-related initiatives include the Kunene Transboundary Water Supply Project between Angola and Namibia, which has reduced water system losses during water transfer from Angola to Namibia; the joint cross-border water supply project between Mozambique and Eswatini at the Lomahasha; the Chirundu Cross-Border Water Supply; and the Sanitation Project between Zambia and Zimbabwe (SADC 2021).

Various regional and international climate-related commitments and frameworks are available to guide SADC-led initiatives (see table below).

Table: Regional and international climate-related commitments *

	Agreement	Selected relevant inclusions
Regional	SADC Regional Early Warning Centre (launched 2010)	Aims to strengthen the SADC mechanisms for conflict prevention, management and resolution in line with the provisions of the Protocol on Politics, Defence, and Security Cooperation and Strategic Indicative Plan for the Organ.
Regional	SADC Climate Change Strategy and Action Plan (2015)	Adaptation options by sector to align with other strategies (e.g. with the Green Growth Strategy).
Regional	SADC Regional Green Economy Strategy & Action Plan for Sustainable Development (2015)	Renewable energy and incentivising a green market.
Regional	SADC Disaster Preparedness and Response Strategy and Fund (2016)	To mobilise resources and assist member states to develop common standards for disaster management.
Regional	SADC Science, Technology, and Innovation Implementation Framework to Support Climate Change Response 2020	Downscaling, models, developing long-term adaptation scenarios, and developing green technologies.
International	United Nations Framework Convention on Climate Change – Paris Agreement 2015	Enhancing adaptation action, including through sharing information, institutional arrangements, strengthening scientific knowledge, and supporting good practice.
International	Sendai Framework for Disaster Risk Reduction 2015-20	Improved understanding of disaster risk in all its dimensions – exposure, vulnerability, and hazard characteristics, strengthening of disaster risk governance.
International	Sustainable Development Goals 2015	Goal 13 to "take urgent action to combat climate change and its impacts", including strengthening resilience and adaptive capacity, improving education, awareness-raising, and human and institutional capacity.
International	The Global Compact for Safe, Orderly, and Regular Migration	Specifically identifies natural disasters, climate change, and environmental degradation as migration drivers. It calls for adaptation and resilience strategies to address sudden and slow onset hazards that consider the implications on migration while prioritising adaption in the home country.
International	The Ramsar Convention on Wetlands 1994 (currently forth Strategic Plan 2016 – 2024)	Specifically targets the preservation of internationally important wetlands and contains a resolution covering climate change impacts, adaptation, and mitigation.
International	Convention on Biological Diversity 1992	Resulted in numerous decisions and technical papers describing the links between biodiversity and mitigation of climate change effects.
International	Global Climate Change Alliance Plus (GCCA+) 2019	This European flagship initiative aims to increase the capabilities of SADC Member States to mitigate and adapt to the effects of climate change. It also aims to support the Regional Indicative Strategic Development Plan, Africa Union Agenda 2063, and SDGs.

*Information for this table retrieved from: Convention on Biological Diversity 1992; Global Compact for Migration 2018; Ramsar n.d.; SADC 2019; and SADC n.d.b.

CLIMATE-FRAGILITY RISKS

Climate change impacts will pose some of the greatest threats to regional stability over the coming decades (Rigaud et al. 2018). A dangerous dynamic is being triggered by increasing scarcity of vital resources, worsening poverty and vulnerabilities, and weakening abilities to adapt or build resilience. High levels of vulnerability mean that even small-scale disasters can have disastrous impacts on affected communities.

The following pathways outline potential interacting climate and security risks. Specific local impacts of climate change might differ, however, from the pathways identified below, given the manifestation of climate-security risks is highly context-specific.

1. Slow- and sudden-onset climate disasters trigger forced migration due to food and livelihood insecurity
2. Climate-induced disasters reduce biodiversity and destroy infrastructure, thereby threatening livelihoods and increasing vulnerability, which in turn can lead to or compound social unrest and instability.
3. Sea-level rise, and marine disaster and disruption threatens mainland coastal communities and island states and impedes opportunities for economic growth and spurs migration.

1. Slow- and sudden-onset climate disasters trigger forced migration due to food and livelihood insecurity

Food insecurity remains a key challenge in the southern African region. Population growth, increasing intensity and frequency of extreme weather events, rising temperatures, and consequently increased competition for already scarce resources have already threatened food security. This drives changing migration patterns, often referred to as climate migration, to areas that are deemed safer and more secure. For most people, this is within their own countries, from rural to urban sites, and within the region (Rigaud et al. 2018; Forster and Fraser 2016; Mbiyozo 2021). In an already food insecure zone, climate change will only further compound the issue. The World Bank estimates that climate change may push around 86 million people in Sub-Saharan Africa to migrate by 2050, with southern Africa experiencing similar movements as people leave areas which are hit the hardest (UNDP 2020).

Of course, the nexus between climate change and migration – particularly in contexts where the climate impacts are slow-onset – is complex and difficult to accurately predict. Some people attribute their decisions to migrate to climate-related stressors. But often, a variety of interconnected reasons, including economic, environmental, social, and political considerations, lead to migration (Stapleton 2017). However, sudden-onset impacts such as climate disasters can be more easily identified as drivers of migration, often occurring as internal displacement. In 2019, more southern African people were forcibly displaced as a result of natural disasters, such as Cyclones Ken and Idai, than by conflict and violence (IDMC 2019).

Climate-related migration can also lead to new vulnerabilities and stresses: migrants who left Malawi, Mozambique, Zambia, and Zimbabwe due to drought and an inability to grow crops sustainably were accused of overburdening already strained economies in neighbouring Botswana, Namibia, and South Africa. Recurring droughts also reignited latent conflicts linked to shared water resources in the region. For example, the Chobe River, which flows through Botswana, Namibia, and Zambia, has long caused disputes and increasing tensions between the countries (Adaawen et al. 2019). In South Africa, as a result of increased unemployment, resource scarcity and related competition, local level conflicts, and violence targeting foreign nationals are increasing as migrants are perceived to put a greater burden on already strained resources and systems (Chileshe 2018).

Therefore, climate change triggers forced migration in the region directly, via more and more intense extreme weather events and increased temperatures, as well as indirectly, via food and livelihood insecurity,. Even though migration is an important and valuable adaptation mechanism, this may contribute to fragility and needs to be managed by the individual countries and the region itself.

2. Climate-induced disasters reduce biodiversity and destroy infrastructure, thereby threatening livelihoods and increasing vulnerability, which in turn can lead to or compound social unrest and instability.

Extreme weather events, rising temperatures, and other consequences of climate change negatively impact biodiversity. Southern African ecosystems are experiencing changes at a rapid rate. Increased wildfire frequency and alien invasive species, which are likely to increase with climate change and heightened levels of atmospheric carbon dioxide concentration, additionally increase biodiversity´s vulnerability to climate change (Davis 2011).

Climate change impacts on biodiversity and natural resources in the region are likely to reduce access to vital resources, land and forests by different segments of society, economic sectors, and species. This could lead to increased competition over scarce but vital natural resources and livelihood sustenance. Worse still, it can become a key driver of violent tensions if measures to facilitate cooperation or resolve conflicts are weakly established and ineffective (Cawthra 2008). Indeed, as noted by the African Union Panel of the Wise on Improving the Mediation and Resolution of Natural Resource-Related Conflicts Across Africa, climate change-related stresses are expected to amplify existing tensions (African Union 2019).

Additionally, infrastructure degradation from climate-induced disasters, such as flooding or extreme storms, can inhibit adequate service delivery capacity of governments, particularly to remote rural areas. This includes essential services such as education, health, and public safety, and threatens to further disadvantage already vulnerable populations living there. If efforts are not directed at inclusive mitigation and adaptation strategies, taking into account infrastructure needs, there is a risk of deteriorating trust, increasing grievances and vulnerabilities among affected populations which can be exploited by bad actors, including extremist groups (Cawthra 2008).

Poverty and inequality further add to other drivers of fragility and conflict (The Nordic Africa Institute 2018). Periodic riots and violent protests in urban areas have been underpinned by poverty and marginalization in the past. In Angola for example, youth protests against the government were triggered by inequalities and the accumulation of wealth by the ruling elite. The government responded with violence and repression. In Zimbabwe, economic despair and corruption led to a wave of social media-driven protests in 2016. Economic grievances and the perception of marginalization also sparked social unrest in Mozambique´s capital Maputo and allowed political entrepreneurs to mobilise fighters for the Renamo rebellion (The Nordic Africa Institute 2018). They also serve as a breeding ground for crime, representing a major driver of insecurity and instability in the region. This is not only true for poorer countries like the DRC or Zimbabwe, but also for wealthier countries, such as South Africa or Mauritius (Cawthra 2008).

As many people´s livelihoods are connected to the tourism, fishery and agricultural sector, climate change poses a particular threat. Reduced biodiversity and fewer economic opportunities lead to different adaptation strategies, such as the search for alternative livelihoods or migration. Discontent with political structures, service provision, corruption, unemployment, and high levels of inequality fuel tensions on a local, national, and cross-border level. Climate change therefore compounds drivers of fragility in the region and might lead to protests, unrest, and conflict.

3. Sea-level rise, and marine disaster and disruption threatens mainland coastal communities and island states, impeding opportunities for economic growth and spurring migration

Southern Africa is dotted with significant coastal cities, including Dar es Salaam, Maputo, Durban, Port Elizabeth, Cape Town, and Luanda, all of whom are vulnerable to rising sea levels and marine climate disasters and disruptions. In the Indian Ocean, the island nations of Madagascar, Mauritius, the Comoros and the Seychelles are especially vulnerable to rising sea levels.

The IPCC expects climate change to flood low-lying coastal lands, negatively impacting coastal settlements (Boko et al. 2007). As a result of increased wind velocity, wave heights will increase as well. In areas already susceptible to coastal erosion, increased storm frequency and intensity will have the biggest additional negative impact (Davis 2011). The island nations and large mainland coastal settlements will be especially affected (Niang et al. 2014). Furthermore, the destruction of coastal ecosystems, like mangroves and coral reefs, will reduce tourism and result in loss of protective ecosystems and fishery stocks, threatening livelihoods in coastal communities (Davis 2011).

In Dar es Salaam for example, 8% of the coastline lies within the low elevation coastal zone. Additionally, the number of people living in this area is expected to significantly increase over the coming years. When sea-level rise and floods are combined, between 61,000 and 110,000 people, depending on population growth, are estimated to be potentially exposed to coastal flooding by 2030. Over time, exposure will increase, potentially reaching over 210,000 people (by 2070), along with about USD 10 billion in assets (highest sea-level rise scenario) (Kebede and Nicholls 2010). The smaller island nations of Mauritius, the Comoros, and the Seychelles are especially susceptible to the effects of natural hazards, including salt water intrusion of fresh water sources and arable land, as well as coastal erosion associated with sea level rise (FAO 2003).

Coastal erosion, combined with rapid population growth and increasing livelihood insecurity, is seen as yet another driver of migration within and between countries. Rapid urbanization, as a result of rural areas threatened by rising sea level or marine disasters and the destruction of infrastructure, results in a significant share of mostly unemployed urban or semi-urban residents. This creates political tensions and potential for instability (Cawthra 2008). Livelihood-seeking migration away from rural and coastal areas, has led to an increasing influx of population into often highly unequal urban settlements. These places are often characterised by only limited access to resources and governmental services (WFP 2021a).

Sea-level rise therefore threatens coastal communities and reduces economic opportunities in the region. This means that people´s livelihoods are threatened and suitable liveable areas along coasts shrink. Compounding this is that migration, born from the need to relocate, could intensify conflicts between communities, increase inequalities, and fuel unrest and tensions.

ENTRY POINTS FOR ADDRESSING CLIMATE FRAGILITY RISKS

The frequency and intensity of climatic hazards and sustained changes to climate patterns in Southern Africa will increase and, as outlined above, are likely to further compound existing fragilities, with dire consequences. Strategic foresight, including forecasting risks by changing weather patterns, can assist in preparing for and reducing the scale of potential negative impwacts. Likewise, mapping systemic vulnerabilities of regions or communities, which are more prone to the effects of climate change, can support the mitigation of fragility or overcoming it by adaptation.

In order to identify and prioritise interventions it is crucial to understand the variety of impacts of climate change in the region. The nature of climate-related hazards, vulnerability and exposure of both, people and the environment, and adaptation capacities should be assessed, including the way they interact with each other (Davis 2011). It is furthermore acknowledged that sustainable results can only be achieved by enhanced participatory and informed programming, especially regarding the most vulnerable groups of population, such as women and young people (Smith et al. 2021).

Mitigating the effects of the climate change-conflict nexus in southern Africa needs to be closely linked to the regional developmental agenda, addressing poverty eradication, unemployment, and inequality. This approach is also highlighted by SADC. Resilience must thus be built through measured and effective responses that address both the climate fragility risks and their subsequent consequences, while simultaneously advancing sustainable development (Johnston 2019; SADC 2020 b). Given the region's vulnerability to both sudden and slow-onset natural disasters and hazards, the need for proactive disaster risk management cannot be overstated.

In line with international practice, and consistent with SADC's approach, the responses to climate change are broadly grouped into reduction in the causes of climate change (mitigation) and reduction in the impact of climate change (adaptation). Having mapped SADC's frameworks, guides, and approaches to mitigation and adaptation in chapter three, it is important to identify gaps and areas where collaboration will prove useful in better shaping responses and action.

Climate-related fragility risks in Southern Africa require concerted action to limit their impacts on people, environment, and the economy. This includes mainstreaming meteorological and climate risk analysis into development planning and practice and the mobilisation of necessary resources to reduce vulnerabilities and exposure.

Key entry points:

- **Strengthen the institutional capacities and ownership of SADC and other regional actors, including strategic foresight and early warning systems for climate-related security risks.**
  SADC's efforts regarding strategic foresight, preventative measures, and response capacities for the most vulnerable countries and island member states in the region should be strengthened and supported, e.g. by forecasting changing weather patterns and mapping out systemic climate fragility risks (SADC 2012).

- **Reinforce existing mitigation strategies such as the SADC Climate Change Strategy and Action Plan.**
  The reinforcement of existing mitigation strategies through technical assistance and capacity building on a local, national, and SADC level is important. Alongside mitigation and adaptation, regional and national early warning systems are central to enable early action. At the same time, monitoring can improve existing initiatives on a regional and local level.

- **Enhance mitigation strategies by conducting regional and national climate-fragility risk assessments across all sectors and improve cooperation to overcome silos, supporting sustainable and efficient responses to climate-security risks.**
  Inter- and intra-state, as well as cross-sectoral cooperation should be enhanced to overcome sectoral and institutional silos and improve the sustainability and efficiency of responses to climate security risks. The African Union Political Affairs, Peace and Security Department (AU PAPS), and assigned departments of regional economic communities, such as the SADC Climate Services Centre, can provide for such multi-level cooperation and furthermore induce cross-continental knowledge management regarding climate change adaptation, resources management, and the prevention of climate-change related conflicts. In this regard, lessons learned from Cyclones Idai and Kenneth, as well as the 2019 drought in Zimbabwe, should be jointly systematized to improve cross-border operational responses and disaster preparedness by SADC institutions and member states.
  Programmes and projects that support mediation and the resolution of resource-related conflicts in volatile contexts need to be enhanced via an integrated approach. By taking climate fragility risks into account, mediation actors can better support efforts to achieve long-term stability and sustainable peace.

- **Identify climate security needs based on locally-informed analysis with regional experts and research institutes, and integrate them further into the mandates and programmes of international, regional, national, and local organisations.**
  This would enable greater coherence of action and would help to address the complex interactions between climate change and fragility across different programmes. Locally informed analysis and consistent integration of it would also help to ensure the design, implementation, and monitoring of context-adequate mitigation strategies.
  Moreover, climate change adaptation and disaster risk reduction should be mainstreamed, and integrated programming (that combines a security, climate action, sustainable development, and peacebuilding lens) strengthened. By adhering to the nexus between climate and security, more sustainable results would be achieved. In particular, while conflicts have not erupted as a direct result of climate stressors, from a planning and preparedness point of view developing conflict-sensitive climate change adaptation is key for advancing sustainable development, the environment, and peace.

- **Vulnerable groups should be socially and economically empowered and the engagement of civil society in the design processes of adaptation programs deepened to improve adaptation strategies and enhance resilience.**
  States, regional actors, and international support partners should continuously and meaningfully engage civil society, especially women and youth, as key stakeholders in the design of adaptation programs and for building adaptive capacities and resilience at the local level. Equally, knowledge and experiences from local communities and vulnerable groups in affected areas should be shared regionally and support the successful implementation of the SADC Climate Change Strategy and Action Plan.
  States, regional actors and international support partners should also develop capacities for more climate-adaptable and resilience-enhancing economic activities to socially and economically empower vulnerable groups and ensure their meaningful and continuous participation in the design and implementation of developmental, environmental, and other policy-making. This assumes an inclusive and cross-sectoral design of programmes and policies.

- **Policymakers should take forward an agenda that considers preventative and climate risk mitigation efforts and adequate funding allocation.**
  Support structures for preventative and climate risk mitigation efforts and adequate funding allocation should build on quantitative and qualitative climate security data and local knowledge, better connect policy sectors, and mainstream aspects of climate security into funding streams. Accordingly, partnerships between the SADC and international agencies,

such as the UN, EU and AU, should be reinforced in a multi-sectoral manner. This would enhance complementary expertise and improved weather and climate forecasting, as well as the integration of climate information into infrastructure, ecosystems, and settlement planning. It would also enhance models for disaster risk reduction and innovative financing for reconstruction and improve and mainstream climate sensitive infrastructure planning.

➲ **Socio-economic stressors that are exacerbated by climate change and related disasters should be addressed in order to build resilience and in light of sustainable urban development.**

For SADC these include, but are not limited to, improving service delivery, reducing primary reliance on sedentary agriculture and aquaculture by communities, improving infrastructure, and increasing equitable access to resources, particularly in the most vulnerable nations.

Accordingly, using more resilient crop varieties should be encouraged and supported. Technological adaptation responses could include stress-tolerant crop varieties, irrigation, and enhanced observation systems. They should build on local knowledge of traditional crop varieties. Agronomic adaptation responses could include agroforestry or conservation agriculture. Smallholder access to credit and other critical production resources should be enhanced. This would help to diversify livelihoods. Institutions should be strengthened at local, national, and regional levels to support agriculture, including early warning systems, and gender-oriented policy.

Additionally, more secure infrastructure for access to clean running water in light of sustainable urban development would improve sanitation and public health and mitigate further climate-related health impacts. Coordination across sectors is necessary to achieve a higher level of health throughout the region.

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