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# Scaling insurance for climate resilience in Africa: Insights from Kenya, Malawi and South Africa.



Commissioned by



**THE  
AFRICAN  
CLIMATE  
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## About Krutham

Krutham, is a leading research and consulting firm that specialises in the financial sectors of emerging markets. Its analysis is used by companies, investors, stockbrokers, regulators, policy makers and companies in South Africa and around the world. It has offices in Johannesburg, London and Boston.

This report was commissioned by the African Climate Foundation (ACF). It was produced independently by Krutham and the contents represent the views of Krutham and its analysts.

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## List of abbreviations

<b>AI</b>	Artificial intelligence
<b>ARC</b>	African Risk Capacity
<b>CDP</b>	Carbon disclosure project
<b>COP29</b>	29th Conference of the Parties
<b>CRED</b>	Centre for Research on the Epidemiology of Disasters
<b>CSI</b>	Corporate Social Investment
<b>DRM</b>	Disaster Risk Management
<b>DRR</b>	Disaster Risk Reduction
<b>EM-DAT</b>	Emergency Events Database
<b>ESG</b>	Environmental, Social and Governance
<b>FEWS NET</b>	Famine Early Warning Systems Network
<b>GDP</b>	Gross Domestic Product
<b>GIS</b>	Geographic Information System
<b>IMF</b>	International Monetary Fund
<b>IRENA</b>	International Renewable Energy Agency
<b>JETP</b>	Just Energy Transition Partnership
<b>KLIP</b>	Kenya Livestock Insurance Programme
<b>MMPI</b>	Malawi Maize Production Index
<b>NAP</b>	National Adaptation Plans
<b>PPP</b>	Public-Private Partnership
<b>SCTP</b>	Social Cash Transfer Programme
<b>UNEP</b>	United Nations Environment Programme
<b>VSLAs</b>	Village Savings and Loans Associations
<b>WFP</b>	World Food Programme

## Executive summary

**This cover note is complemented by in-depth country case-studies covering the insurance markets and their role in adaptation and resilience in South Africa, Kenya and Malawi.**

This research explores the viability and potential of using insurance as a tool for climate risk management and resilience in Kenya, Malawi and South Africa, with a focus on addressing climate vulnerabilities and supporting adaptation efforts.

**Climate change is driving natural disasters and putting pressure on insurance systems across these countries.** Rising temperatures and extreme weather events, such as droughts and floods, increase physical risks for insurers, leading to higher claims and premiums, which widen the protection gap. Transition risks, particularly in South Africa, also pose challenges as decarbonisation efforts threaten the value of assets tied to carbon-intensive industries.

**Insufficient funding and a reactive approach to disaster management undermine resilience-building efforts.** All three countries struggle with inadequate disaster risk reduction budgets, exacerbated by fiscal constraints, debt burdens and reliance on external funding, particularly in Malawi. Poor integration of climate risk management in government systems and weak collaboration between public and private sectors limit the effectiveness of insurance as a resilience tool.

**Insurance can reduce reliance on emergency aid and promote resilience if payouts are timely and efficient.** Cost-benefit analyses of African Risk Capacity (ARC) sovereign insurance products demonstrate significant welfare benefits, such as improving household consumption by 18% to 20% annually and offering \$1,642.50 in ex-ante benefits per payout (Kramer et al., 2020). Insurance provides timely financial relief, reduces reliance on emergency aid and incentivises risk reduction through risk-based premiums. However, its impact depends heavily on efficient and timely payouts, as delays undermine the welfare and resilience benefits of these programmes.

**Varying market maturity and low insurance penetration hinder the capacity to address climate risks, especially for vulnerable**

**populations.** While South Africa has a developed insurance market capable of managing climate risks, Kenya leads in innovation, particularly with agricultural insurance. Malawi faces challenges with low market penetration, but future growth could offer opportunities for new climate risk products.

**The insurance industry has significant potential to support climate adaptation but is constrained by gaps in private-public participation policies, limited metrics and resource gaps.** Insurers and reinsurers play a critical role in climate adaptation as risk managers and institutional investors. They can expand this role and drive resilience through climate-focused investment strategies, public awareness campaigns and bundling insurance with adaptation incentives. However, barriers such as inadequate policy frameworks, limited adaptation metrics and insufficient financial resources restrict private sector engagement, particularly in smaller and nascent markets like Malawi.

## Recommendations

- 1. Mainstream climate resilience:** Integrate climate resilience into public budgeting and infrastructure planning to ensure sustainable development. This includes incentivising climate-adaptive public-private partnerships, developing valuation frameworks and mandating adaptation in public funding mechanisms.
- 2. Strengthen data infrastructure:** Improve climate risk assessment and adaptation measures through modernised weather monitoring, satellite data integration and centralised climate databases. Enhancing data interoperability and promoting open data policies are key actions.
- 3. Leverage digitalisation:** Expand insurance access through digital platforms, partnering with InsurTech and mobile operators for efficient premium collection and claims. Supportive regulations and infrastructure are crucial for realising these benefits.
- 4. Innovative financial vehicles:** Develop financial mechanisms beyond traditional funding, such as blended finance, resilience bonds and

guarantee schemes, to attract investment and foster public-private partnerships for climate-resilient economies.

**5. Enhance local government capacity:**

Strengthen local governments in public asset management with improved resources, data systems and public-private collaboration. Comprehensive asset registries and targeted capacity-building initiatives can align investments with resilience priorities, supported by partnerships with insurers and private stakeholders. Establishing country-led investment platforms for adaptation and resilience can also support a coordinated and strategic approach to addressing some of the key recommendations in these reports.



## Introduction

Recent extreme weather events in Africa have underscored the continent's vulnerability to climate change and the urgent need for resilience measures. In 2023, economic losses from natural catastrophes in Africa reached \$14.65 billion, a dramatic 262% increase from \$4.05 billion in 2019 (MunichRe, 2024). Additionally, fatalities rose by 300%, with 10,912 lives lost in 2023 compared to 2,723 in 2019.

Beyond immediate disasters, Africa faces long-term climate challenges that threaten sustainable development. Rising temperatures and shifting rainfall patterns are projected to reduce agricultural yields by up to 30% by 2050 in many regions, undermining food security and rural livelihoods (Carleton, 2022; UNEP, 2023). Slow onset impacts such as soil degradation, water scarcity and biodiversity loss pose systemic risks to productivity, human health and economic stability. The economic toll of climate change on Africa is substantial, with losses estimated at 3.8% of GDP in net present value terms by 2050 and an anticipated 9.3% GDP reduction by mid-century (Nicolson et al., 2023).<sup>1</sup>

Despite these pressing challenges, Africa faces a significant adaptation funding gap, estimated at 5.3% of GDP (Nicolson et al., 2023). This gap reflects the difference between the financial resources required for effective climate adaptation and the funds currently available. Funding sources include government budgets, private sector investments, international climate funds and financing flows from multilateral and bilateral development banks (UNEP, 2023). Compounding the issue, approximately one-quarter of climate impacts are considered "uncoverable," meaning no cost-effective adaptation solutions exist. This shortfall perpetuates cycles of vulnerability, undermining disaster recovery efforts and limiting long-term adaptation measures, which in turn erodes development progress and exacerbates poverty.

Within this context, insurance has emerged as a potentially powerful tool for managing climate

risks in Africa. The concept gained traction in the early 2000s as development practitioners and policymakers sought innovative financial mechanisms to address climate vulnerability. This has led to several initiatives in the global South that integrate insurance into climate and disaster risk management strategies. Key programmes include the Caribbean Catastrophe Risk Insurance Facility, African Risk Capacity (ARC), the InsuResilience Global Partnership and the UN World Food Programme's R4 Rural Resilience Initiative.

These initiatives demonstrate how insurance, when well-structured, can strengthen climate resilience. First, insurance provides financial protection and facilitates recovery by enabling immediate access to post-disaster funds, which helps prevent harmful coping strategies at the household level and stabilises government budgets. Second, it quantifies and prices climate risks, incentivising risk reduction through mechanisms like premium discounts for protective measures (Camargo, 2019). Third, it supports broader development by facilitating access to credit and investment opportunities, particularly for smallholder farmers (WFP, 2023; You & Shee, 2022).

However, the role of insurance in Africa's climate resilience landscape remains complex and contested. While insurance is a valuable component of climate and disaster risk management, it is not a standalone solution (Camargo, 2019; Kreft & Kohler, 2019). Challenges such as gaps in historical loss and damage data, limited capacity among local insurers to underwrite climate risks, low insurance penetration and affordability issues hinder the effectiveness of insurance schemes. These limitations underscore the need for complementary approaches to strengthen resilience at both the macro and household levels.

<sup>1</sup> Estimates are based on the assumption of no adaptation action and a 2°C rise in temperature.

## Scaling insurance for climate resilience in Africa: Insights from Kenya, Malawi and South Africa

This project explores the viability of using insurance for climate risk management and resilience purposes in three countries: Kenya, Malawi and South Africa. These countries were selected because they face significant climate impacts and have similar socio-economic vulnerabilities but represent different levels of insurance market development (see **Annex 1: Definitions of key terms** for definitions of insurance penetration and density). South Africa has a mature insurance sector with high penetration rates, Kenya has low penetration rates but benefits from a supportive regulatory environment to use insurance for resilience purposes, while Malawi's insurance sector is characterised by very low penetration, reliance on donor-supported pilot programmes and high climate risk exposure.

The project aims to contribute to the existing knowledge base on this topic by focusing on how market development, regulations and socio-economic conditions affect insurance scaling for climate resilience. The study explored scaling pathways through social protection, disaster risk management, agricultural programmes and

mobile money systems. These pathways were assessed in the context of local constraints, including infrastructure, distribution channels and market capacity.

While insurance plays an important role, the research underscores that it is not a "magic bullet" solution. Effective insurance interventions must be demand-driven, targeting areas where climate risks impede the adoption of critical solutions. Insurance companies often engage in this space only when public funding or external support is available, with innovation and product development largely driven by actors such as brokers, scientists, and agricultural experts.

The findings highlight the importance of a collaborative, multi-stakeholder approach. The insurance sector should complement solutions led by demand-side actors rather than imposing products where they may not be needed or used as substitutes for proactive adaptation measures. Key recommendations include fostering data-sharing initiatives, creating country-specific investment platforms, and promoting public-private partnerships. These measures aim to establish an enabling ecosystem where insurance can support broader climate resilience efforts.

The table below outlines the focus areas and objectives that drove this research project.

Table 1: Research focus area and objectives

Focus area	Research objectives
<b>Climate change and impacts on the insurance industry</b>	<ul style="list-style-type: none"> <li>Assess climate change impacts on key sectors (e.g., agriculture, water, infrastructure) and GDP growth.</li> <li>Examine physical and transition risks for insurers and reinsurers.</li> </ul>
<b>Climate and disaster risk financing</b>	<ul style="list-style-type: none"> <li>Analyse current financing mechanisms, including risk-layering, national absorption capacity, and risk transfer instruments.</li> <li>Identify gaps and opportunities.</li> </ul>
<b>Insurance sector analysis</b>	<ul style="list-style-type: none"> <li>Review insurance market capacity and regulation of climate risks.</li> <li>Evaluate the industry's experience in providing climate risk insurance to vulnerable groups through government- or donor-led programmes.</li> <li>Assess the impact of existing climate and disaster insurance products on resilience and explore future scaling opportunities..</li> </ul>
<b>Insurance industry's participation in adaptation</b>	<ul style="list-style-type: none"> <li>Explore insurers' roles in adaptation through investments, asset management, and CSI/ESG initiatives.</li> <li>Assess climate policies and PPP frameworks to enhance participation.</li> </ul>
<b>Recommendations</b>	<ul style="list-style-type: none"> <li>Focus on potential solutions to enhance the viability of insurance as a climate risk management tool</li> </ul>

## Methodology

The research methodology for this series of reports combined rigorous desk research with extensive stakeholder engagement conducted over an eight-month period from April to November 2024.

### Desktop research

Table 2: Data and sources

Data category	Sources and reports
Policy and regulatory documents	<ul style="list-style-type: none"> <li>National adaptation plans and climate change policies</li> <li>Insurance sector regulations and frameworks</li> <li>Financial sector development strategies</li> <li>Disaster risk management policies</li> <li>Climate Change Acts and related legislation</li> </ul>
Market and industry data	<ul style="list-style-type: none"> <li>Annual reports from regulatory authorities</li> <li>Insurance industry association publications</li> <li>Company annual reports and financial statements</li> <li>Market penetration and performance statistics</li> </ul>
Insurance programme documentation	<ul style="list-style-type: none"> <li>Impact evaluations of existing insurance schemes</li> <li>World Bank Climate Change and Development Reports</li> <li>Programme implementation reports from initiatives such as InsuResilience</li> <li>Company impact reports, particularly from One Acre Fund programmes</li> </ul>
Climate finance expenditure	<ul style="list-style-type: none"> <li>African Development Bank climate finance tracking reports</li> <li>Climate Finance Landscape reports</li> <li>Global Centre on Adaptation State and Trends Africa Reports</li> <li>Planning Africa Adaptation Finance analyses</li> <li>UNEP's Adaptation Gap Reports</li> </ul>
Climate and disaster risk assessments	<ul style="list-style-type: none"> <li>EM-DAT International Disaster Database records</li> <li>National meteorological department data</li> <li>World Bank Climate Change and Development Reports</li> <li>Sub-national risk assessments</li> </ul>

The desk research phase involved a systematic review of five key areas, outlined in Table 2. Additionally, the insurance discussions in the case study reports focus on agricultural insurance and the types of farmers these target and risks covered. See **Annex 2: Agriculture insurance market segmentation** for more information.

### Stakeholder engagements

Stakeholder engagement was key, focusing on insurance, adaptation, resilience, product design, regulatory frameworks, risk assessment and market opportunities. The research involved 23 engagements with 33 representatives from:

- Insurance companies and brokers
- Regulatory bodies and industry associations
- International financial institutions and development organisations
- Agricultural specialists

- Research/academic institutions

### Peer review

To ensure analytical rigour, the preliminary findings underwent a peer review involving independent experts in climate finance, insurance and adaptation. This process helped validate the research findings and refined the recommendations to ensure their practical applicability in the African context. Peer reviewers participated in:

- South Africa:** three reviewers
- Kenya:** two reviewers

- **Malawi:** one reviewer

## Panel discussion

The research also benefited from valuable feedback gathered during a dedicated panel discussion hosted by the African Climate Foundation at COP29 in Baku, Azerbaijan. This session brought together key stakeholders from across the continent to discuss the preliminary findings and their implications for scaling climate risk insurance in Africa. The panel discussion focused on:

- **Market development and sustainability:** Commercial viability, premium subsidies and product design.
- **Innovation and technology:** Digital solutions and InsurTech innovations.
- **Data and infrastructure:** Partnerships for data sharing and risk assessment.
- **Investment alignment:** Insurers' roles in climate adaptation investments.
- **Coverage models:** Meso-level solutions and municipal insurance products.

These discussions enriched the research with insights on practical implementation and market development for climate risk insurance in Africa.

## Key findings and recommendations

### Climate change and the insurance industry

Climate change poses a critical threat to the development paths of Malawi, Kenya and South Africa. Despite differences in economic structures and capacities to handle the impacts, all three countries face increasing extreme weather events and long-term climate stresses, leading to significant economic losses and social disruption.

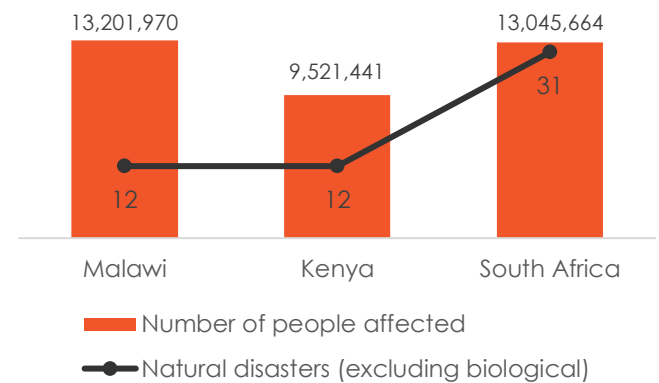
#### Extreme weather events

Kenya and Malawi have experienced severe natural disasters including droughts, floods and cyclones. From 2019 to 2024, each country recorded 12 natural disasters. Kenya suffered floods almost every year between 2010 and 2020, affecting, per event, between 11,000 and nearly one million people. In 2024, severe floods in 40 out of 47 counties resulted in more than 230 deaths, displaced about 40,000 households and caused extensive damage to infrastructure and agriculture (Clemens et al., 2024; Njeru, 2024). Although droughts are a primary concern, some models predict increased rainfall and flood risks which are not fully addressed in national policies (Detelinova et al., 2023).

Floods and storms have also caused significant damage in Malawi, with five cyclones hitting the country since 2019. Cyclone Freddy recently caused unprecedented destruction, damaging 50,000 houses and displacing 659,000 people (CDP, 2023; Changwanda & Clayton, 2023; FEWS NET, 2023). The agricultural sector, crucial to Malawi's economy, suffered losses affecting more than two million farmers and causing damages totalling \$1bn (Changwanda & Clayton, 2024). The frequent extreme weather events trap Malawi in a cycle of response and partial recovery, worsened by limited fiscal capacity and reliance on international aid focused more on relief than rehabilitation (Changwanda & Clayton, 2023; Marchal, 2021).

Extreme weather events in South Africa have been more localised and more frequent. In particular, South Africa has experienced an

Figure 1: Number of disasters and people affected, 2019-2024



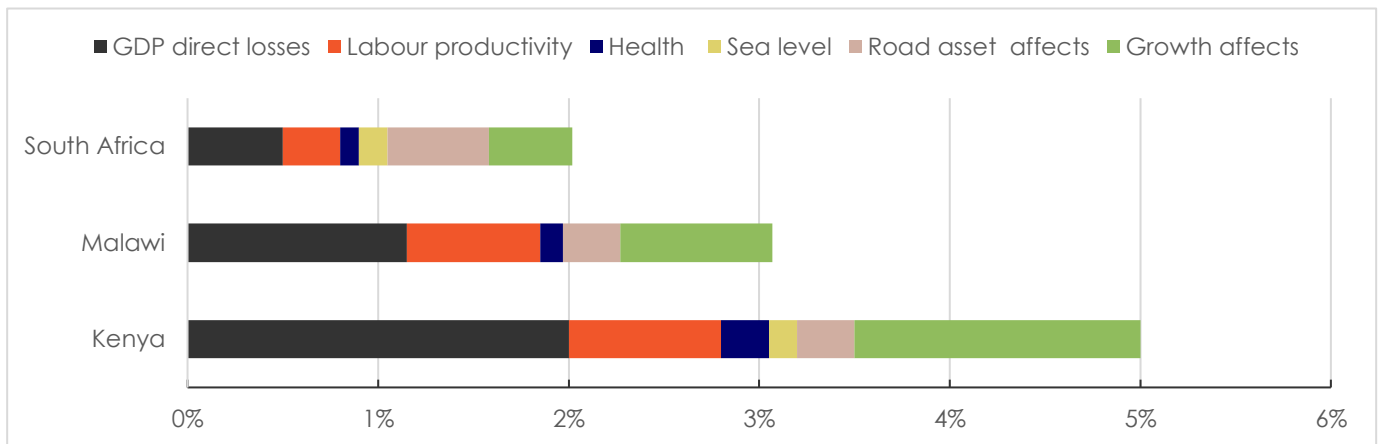
Source: EM-DAT (2024)

increase in “secondary perils” – smaller-scale events that occur more frequently than major catastrophes such as the KwaZulu-Natal floods in 2022. For instance, in the past five years, South Africa has recorded 31 natural disasters, resulting in nearly 1,000 deaths, displacing more than 7,000 people and affecting more than 12-million individuals (EM-DAT & CRED, 2024). The country has experienced a rise in annual surface temperature from 0.5°C in 2012 to 1.09°C in 2022, contributing to more extreme weather events, heavy rains and disruptions to biodiversity habitats (Ziervogel et al., 2022).

#### Economic impact projections

Across Kenya, Malawi and South Africa, agriculture and water resources are the primary sectors affected by climate change, with ripple effects on GDP and livelihoods. Figure 2 illustrates that Kenya faces the highest overall economic impact, driven by direct GDP losses and growth effects. In contrast, the economic impact of climate change in Malawi will have devastating consequences for labour productivity, which reflects the country's reliance on agriculture and the impact of extreme weather on this sector. In South Africa, road asset damage will have major economic impacts due to the infrastructure vulnerabilities, particularly a significant reliance on road logistics due to inefficiencies and neglect of freight rail systems (Nicolson et al., 2023).

Figure 2: Economic impact of climate change without adaptation (NPV of GDP to 2050)



Source: Nicolson et al (2023)

## Climate change impact on the insurance industry

The increasing frequency of extreme weather events and the long-term economic effects of climate change present significant challenges to the insurance industry. These challenges manifest as physical and transition risks, each requiring tailored responses to maintain industry stability and relevance.

- Physical risks:** Insurers across all three case study countries are grappling with rising claims driven by the growing frequency and severity of climate-related disasters. These include losses linked to property, agriculture, health and business interruption. The inability to predict and price future risks accurately has resulted in higher premiums, which in turn widen the protection gap by making climate risk insurance unaffordable for many.
- Transition risks:** Transition risks stem from the global shift towards low-carbon economies, which impact insurers' investment portfolios and underwriting practices. These risks include asset devaluation, stranded assets and regulatory changes that disrupt market stability. This challenge is particularly pronounced in economies with high reliance on carbon-intensive sectors.

### The capacity to address these risks varies significantly across the countries studied.

In South Africa, a mature and well-capitalised insurance industry accounts for 18% of the financial sector's assets (IMF, 2022) and has one of the world's highest insurance penetration rates at 10% (Atlas, 2022), as well as a high insurance

density of \$905 per capita (AfricaRe, 2021). While the sector demonstrates strong capacity to manage physical risks, rising claims ratios from extreme weather events have hardened reinsurance renewal terms, driving up premiums and eroding underwriting profits for both primary non-life insurers and composite reinsurers.

However, transition risk poses a greater challenge. The South African economy's heavy dependence on coal – accounting for over 70% of primary energy consumption (IRENA, 2024) – exposes insurers to significant risks of asset devaluation and regulatory disruption. Institutional investors, including major insurers such as Sanlam, are key stakeholders in the coal sector (Mbebe et al., 2024). For instance, the implementation of the Just Energy Transition Partnership (JETP), which aims to decommission two-thirds of coal assets by 2035, creates complexity for insurers who must balance their existing portfolio exposures with growing transition risks. While some insurers have begun implementing restrictions on new thermal coal projects, the industry's approach remains cautious, with most firms continuing to provide coverage for existing fossil fuel operations.

Transition risks are less pronounced in Malawi and Kenya due to their lower exposure to carbon-intensive industries. Instead, physical risks pose severe threats to the insurers' sustainability. Insurers face increasing claims due to frequent extreme weather events like floods and droughts. As such, the challenge for insurers in these two countries to accurately predict and price future losses is particularly difficult, leading to higher premiums for property, agriculture, health and business

interruption coverage. This makes insurance unaffordable for many.

The insurance industry must adapt to these risks through country-specific strategies. In South Africa, insurers need to focus on managing transition risks while addressing physical risk portfolios. Kenya and Malawi must prioritise physical risk management, with Malawi requiring

external support to strengthen market capacity and Kenya needing regulatory innovation to maintain affordability and expand coverage. Across all three countries, integrating climate adaptation policies and innovative risk management solutions is essential to ensure industry resilience in the face of escalating climate challenges.

Figure 3: Summary of physical and transition risks for insurers

<b>South Africa</b>	<b>Physical risks</b>	<ul style="list-style-type: none"> <li>Moderate to high, driven by neglected infrastructure and medium-severity events.</li> </ul>
	<b>Transition risks</b>	<ul style="list-style-type: none"> <li>Very high, due to exposure to coal and mining sectors, with regulatory changes (eg, JETP) further complicating risk management.</li> </ul>
<b>Kenya</b>	<b>Physical risks</b>	<ul style="list-style-type: none"> <li>High physical risks from extreme weather events affecting multiple claim categories.</li> </ul>
	<b>Transition risks</b>	<ul style="list-style-type: none"> <li>Moderate transition risk, mitigated by renewable energy reliance and climate policies promoting green practices.</li> </ul>
<b>Malawi</b>	<b>Physical risks</b>	<ul style="list-style-type: none"> <li>Very high relative to capacity, with extreme weather events posing significant challenges to a small insurance market.</li> </ul>
	<b>Transition risks</b>	<ul style="list-style-type: none"> <li>Lowest transition risk, though alignment with ESG standards may introduce some sectoral risks.</li> </ul>

## Climate and disaster resilience financing

To understand the potential of insurance to strengthen climate resilience financing strategies, it is necessary to explore how governments, international organisations, private sector stakeholders and communities currently plan and fund risk reduction. The research reports examine climate and disaster resilience through three interconnected approaches that highlight both the challenges and opportunities in managing climate risks across Kenya, Malawi and South Africa. These approaches are:

- Risk reduction through DRR and adaptation investments
- Risk retention through budgetary mechanisms, contingency funds, social protection programmes
- Risk transfer through insurance and other instruments

In terms of risk reduction, the findings reveal common gaps across all three countries. First, funding allocation from public budgets towards DRR is limited and overfocused on disaster response. This reveals an overall reactive approach toward climate and disaster risk management, exacerbated by growing adaptation funding gaps. This reinforces a reliance on ex-post budgetary mechanisms for

disaster response. However, limited fiscal space across all three countries constrains funding for recovery and prevents “building back better”. It also limits adaptation and DRR initiatives. Second, a significant barrier undermining resilience building is the gaps in planning, coordination and implementation across government levels, public and private sectors and communities.

South Africa retains significant risk, while Kenya and Malawi have experience in using insurance to transfer the financial risk of disasters. Both countries have integrated ARC sovereign insurance into their social protection systems, leveraging it to enhance resilience against climate-related disasters. The potential for enhancing resilience by integrating insurance is particularly high in South Africa and Kenya, where it could incentivise municipal-level adaptation planning. Cost-benefit analyses of the ARC programme highlight substantial welfare benefits, improving household consumption by 18% to 20% annually and offering \$1,642.50 in ex-ante benefits per payout (Kramer et al., 2020). **These benefits, however, largely depend on the speed and efficiency of payouts.** Delays in insurance payouts can significantly diminish the welfare and resilience benefits of these programmes at the micro, meso and macro levels.

Table 3: Summary of climate and disaster resilience financing

	South Africa	Kenya	Malawi
<b>Risk reduction</b>	<ul style="list-style-type: none"> <li>• Limited dedicated funding for DRR or private sector-led adaptation investments; focus on mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>• Government and donor-supported DRR efforts with significant public adaptation spending.</li> </ul>	<ul style="list-style-type: none"> <li>• Underfunded DRR, with adaptation primarily externally financed.</li> </ul>
<b>Risk retention</b>	<ul style="list-style-type: none"> <li>• Contingency reserves and budget mechanisms like disaster relief and recovery grants.</li> </ul>	<ul style="list-style-type: none"> <li>• World Bank CAT-DDO, National Drought Fund and scalable safety nets like the Hunger Safety Net Programme.</li> </ul>	<ul style="list-style-type: none"> <li>• World Bank CAT-DDO, contingency budgets and a strategic grain reserve.</li> </ul>
<b>Risk transfer</b>	<ul style="list-style-type: none"> <li>• Limited risk transfer</li> <li>• Private insurance generally unsubsidised.</li> </ul>	<ul style="list-style-type: none"> <li>• Established agriculture and livestock insurance programmes.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited uptake; ARC policy for early drought response and past use of weather derivatives.</li> </ul>

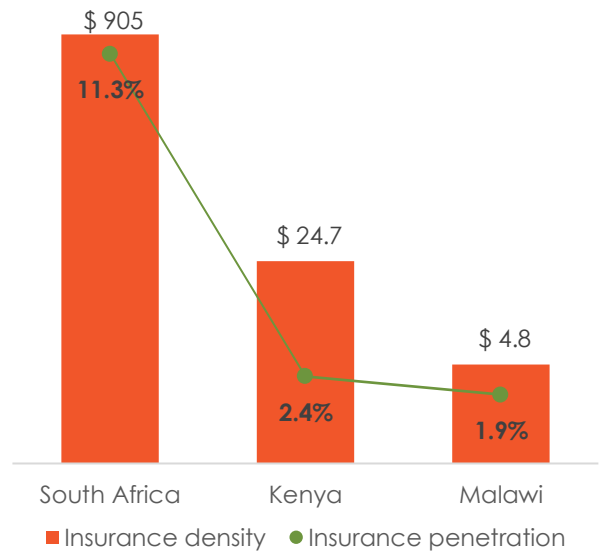


Expanding insurance for climate resilience purposes is less viable in Malawi, especially in the short term due to the country's high physical risks and affordability constraints. However, Malawi faces a significant disaster recovery funding gap, and insurance can incentivise long-term resilience planning and faster recovery from natural disasters due to the immediate liquidity benefits insurance provides.

## Insurance market depth

- **South Africa** leads in insurance penetration (11.3%) and density (\$905) with a highly mature market with 162 insurers. The sector benefits from strong capitalisation in both primary insurers and reinsurers, making it well equipped to handle a range of risks. The market is solvent and liquid with a diverse portfolio, though rising reinsurance costs driven by climate risks remain a challenge. The market relies heavily on international reinsurers for managing these growing risks.
- **Kenya** has a lower insurance penetration of 2.4% and moderate density of \$24.7 but shows significant growth potential. The market is characterised by its diversity, with 64 insurers (including five reinsurers) and an emphasis on innovative digital insurance solutions, particularly in agriculture and climate risk coverage. The presence of strong local reinsurers, such as Kenya Re, provides a level of resilience against climate risks and enhances the sector's capacity to manage these challenges. However, the insurance sector also has challenges in profitability, with a combined ratio of 287% in 2023.
- **Malawi** has one of the lowest insurance penetration rates at 1.9% and a density of just \$4.82. Despite this, the market is expected to grow with a compound annual growth rate exceeding 15% from 2024 to 2028, presenting opportunities for climate risk product development. Limited market size and capacity restrict its ability to manage large-scale climate risks effectively, though growth potential exists in specialised climate risk solutions.

Figure 4: Insurance penetration and density in Malawi, Kenya and South Africa



Source: AfricaRe (2022), SwissRe (2024)

## Climate and disaster insurance programmes and products

This section explores the diverse approaches to climate risk insurance across Kenya, Malawi and South Africa. Each country has developed unique strategies to integrate insurance with broader resilience measures, tailored to their specific economic and environmental contexts.

**Kenya has developed a diverse climate risk insurance landscape, particularly in the agricultural sector.** The country has pioneered several innovative approaches, including replanting guarantees, risk-contingent credit insurance and bundled insurance schemes. Programmes like the Kenya Livestock Insurance Programme (KLIP) and the World Food Programme's R4 Rural Resilience Initiative demonstrate how insurance can be integrated with broader resilience strategies. These programmes have helped create significant market experience and expertise in climate risk insurance.

**Malawi has implemented a multi-tiered approach to climate risk insurance, operating at the macro, meso and micro levels.** At the macro level, initiatives like the Malawi Maize Production Index (MMPI) and previous participation in the African Risk Capacity (ARC) demonstrate attempts at

sovereign-level risk management. At the micro level, programmes like One Acre Fund, reaching over 510,000 farmers and the R4 Resilience Initiative, serving 26,386 farmers, have shown promising results in improving agricultural resilience.

**South Africa's insurance landscape differs significantly from that of Malawi and Kenya's experience which have targeted climate risk insurance programmes initiated and subsidised by governments or international NGOs.**

South Africa lacks such subsidised and despite the financial strength and risk expertise of the country's insurance sector, insurance has not been widely used as a tool in sustainable development programmes. Yet, private insurers offer a comprehensive range of climate-related insurance products. These include traditional property and agricultural insurance, as well as innovative solutions like the fire insurance programme for informal settlements in the Western Cape. The country also has an extensive social welfare system, with a wide range of social grants aimed at alleviating poverty among the country's most vulnerable populations (The World Bank Group, 2021). This includes social grants, a social relief grant (launched in response to Covid-19 and then extended), free basic services and public works programmes. This provides a strong foundation that could be leveraged to strengthen climate resilience.

**Common challenges and limitations**

Across South Africa, Kenya and Malawi, several common challenges hinder the effective use of insurance for building climate resilience.

- Affordability remains a key issue, particularly for vulnerable populations who are most in need of protection but often unable to access coverage.
- Additionally, limited data infrastructure undermines accurate risk assessment, reducing the efficiency and reliability of insurance products.
- Balancing commercial viability with social protection objectives poses another challenge, as insurers must ensure their offerings remain both profitable and inclusive. The research emphasises that insurance should be integrated into broader climate resilience strategies and not seen as a standalone solution.

**Opportunities for growth**

Despite several challenges, there are distinct opportunities and strengths in each country that can be leveraged to scale the use of insurance for climate resilience:

**South Africa** has a unique opportunity to expand insurance coverage for vulnerable populations by leveraging its extensive social protection systems.

**Kenya** can build on its strong InsurTech ecosystem and integration with mobile money platforms to enhance accessibility. There is significant potential to use cooperatives as a platform for expanding agricultural insurance.

**Malawi** has the opportunity to integrate technology-enabled solutions into its insurance framework, focusing on mobile-first approaches and forming public-private partnerships. These efforts could target vulnerable populations effectively through mechanisms like village savings and loans associations (VSLAs) and the Social Cash Transfer Programme (SCTP).

Table 4: Climate and disaster risk management products, impact on resilience

Impact on resilience	
<b>South Africa</b>	<ul style="list-style-type: none"> <li>• Fire insurance for informal settlements has <b>protected R142m worth of property</b> from fire damage and the fire sensors has limited the <b>spread of 94% if fire outbreaks</b></li> <li>• Grants have been associated with a <b>12,71% poverty exit rate</b></li> <li>• The Older Persons Grant (OPG) has been linked to <b>better nutrition, food security and healthcare for younger household members.</b></li> </ul>
<b>Kenya</b>	<ul style="list-style-type: none"> <li>• KLIP has improved pastoralist livelihoods <b>by mitigating income loss during droughts</b> and reducing adverse coping strategies.</li> <li>• At the macrolevel, by transferring risk to the private sector, KLIP has <b>reduced the government's financial burden</b> to finance drought response and since its inception in 2015 to 2021, triggered \$10m in payouts by the private sector (Fava et al., 2021).</li> </ul>
<b>Malawi</b>	<ul style="list-style-type: none"> <li>• Improvements <b>in food security</b>, with long-term participants in donor-led insurance schemes being 52% more likely to maintain food reserves during lean seasons and demonstrating <b>25% higher asset accumulation over three to five years.</b></li> <li>• Furthermore, these programmes have <b>decreased the likelihood of households adopting negative coping mechanisms</b> such as taking children out of school or selling households assets.</li> </ul>

## Insurance sector participation in climate adaptation

As risk managers and institutional investors, insurers and reinsurers are uniquely positioned as critical partners in adaptation and resilience planning. First, as institutional investors, they can integrate resilience into their portfolios through investments in instruments such as green bonds and infrastructure projects with climate adaptation components that aligns with climate commitments and adheres to regulatory requirements. Second, insurers can promote resilience indirectly by influencing investee companies to adopt best practices in climate risk management. Third, insurers can boost societal resilience by leveraging their expertise to raise awareness and support public policies for adaptation, including public-private partnerships. These efforts help maintain asset insurability, expand insurance penetration and address the climate risk protection gap, benefiting insurers even without immediate financial returns.

Focusing on these pathways, we found varying levels of participation across the three countries, influenced by differences in investment capacity, policy environments and market maturity:

**Adaptation-focused investments are limited due to the absence of frameworks that quantify adaptation benefits.** However, insurers do show a willingness to invest in mitigation efforts such as green buildings and renewable energy.

When insurers do participate in climate adaptation and resilience planning, it is typically through **ESG initiatives or corporate social investment efforts.**

In South Africa, initiatives like Santam's Partnership for Risk and Resilience (P4RR) programme demonstrate how insurers can collaborate with municipalities to enhance resilience by **sharing climate risk data on flooding**, which can be used for urban and human settlement planning.

**Stringent regulations on asset allocation structures undermines**, for instance, private equity investments in alternative assets. This represents significant underused investment and capacity potential to drive climate adaptation with the insurance industry as a key stakeholder.

**Policy gaps in adaptation and public-private partnerships:** A key finding across South Africa, Kenya and Malawi is the lack of clear policy frameworks and regulatory provisions to support adaptation-focused public-private partnerships (PPPs). While South Africa and Kenya have

### How are insurers leveraging digitalisation and InsurTech solutions?



#### Partnerships

- Leveraging digitalisation through **partnerships with InsurTech companies, which makes insurance more accessible.**
- **Partnerships with mobile network operations for distribution.**
- These collaborations involve the adoption **mobile policy** purchases and blockchain technology.



#### AI risk assessments

- Insurers are employing artificial intelligence and machine learning for data collection, underwriting and customer engagement.
- Rollout of geo-coding to enhance risk selection and rating.
- Implementing segmented premium increases and higher excess amounts for selected risks, such as flooding.



#### Targeting

- Public-private partnerships can leverage digital solutions to target vulnerable populations more effectively through savings associations and existing cash transfer systems.

developed National Adaptation Plans (NAPs), there are notable gaps in these plans concerning the role of insurers and the broader private sector in adaptation initiatives. South Africa's robust PPP framework does not provide clear provisions for climate adaptation, limiting the potential for insurers to engage in adaptation-related projects. In Kenya, the regulatory environment for adaptation-focused PPPs is still evolving and although climate risk disclosure requirements exist for insurers, these regulations are not yet fully aligned with adaptation objectives. Malawi's situation is more pronounced, as it lacks a comprehensive national adaptation strategy, creating significant uncertainties for both public and private sector participation in adaptation initiatives.

**Integrating adaptation and resilience into sustainability reporting:** The integration of adaptation and resilience into sustainability reporting standards is limited, especially compared with the focus on emissions reduction and transition risks. Under IFRS S2, companies are required to disclose information on physical climate risks, climate resilience plans, business model adaptation strategies and the financial impacts of adaptation measures. However, the standards do not provide specific requirements for adaptation metrics or frameworks to assess the effectiveness of resilience measures. Adaptation is often treated as secondary to mitigation efforts, with insufficient guidance on resilience planning and no standardised templates for reporting adaptation initiatives. This lack of a robust framework for measuring and reporting adaptation further complicates efforts to track and promote climate resilience in the private sector.

**Lack of standardised metrics: The lack of standardised** metrics for evaluating the benefits of adaptation investments is a well-known issue and major barrier in mobilising investments for climate and disaster resilience efforts. This is because investors it makes it difficult for insurers and other private sector entities to assess the financial viability of adaptation projects. Furthermore, the absence of clear frameworks and measurable targets for adaptation investment limits the potential for meaningful engagement from the private sector.

**Capacity and coordination issues:** There is insufficient coordination between insurance

regulators and climate policymakers, which results in missed opportunities for integrating insurance into national adaptation strategies. Additionally, the capacity of both the public and private sectors to engage effectively in PPPs is often limited, especially in countries like Malawi where insurance markets are underdeveloped and the regulatory environment is not fully aligned with climate risk management goals.

**Financial constraints and bankability:** One of the significant barriers to PPPs in the climate resilience space is the lack of bankable projects. Many adaptation projects lack the financial returns necessary to attract private sector investment, particularly in countries like Malawi, where market size and capital constraints limit the development of such projects. In Kenya, while insurers are exploring climate risk investments in sectors like renewable energy, regulatory uncertainty and limited investment capacity restrict the full potential of these opportunities.

## Recommendations

The following recommendations have emerged as critical issues that need to be addressed to strengthen the role of insurance in resilience and tackle broader adaptation challenges. These include:

### Strengthen data infrastructure for climate adaptation and risk management

Accurate, accessible and centralised data infrastructure is critical to enable effective climate risk assessment, enhance decision-making and improve the design and implementation of adaptation measures. Modernising data systems and integrating diverse data sources can support timely and informed responses to climate challenges.

Key actions include:

- **Modernise weather monitoring systems:** Upgrade national meteorological systems by installing advanced weather stations, radar systems and other modern equipment. These upgrades will improve the accuracy of localised weather forecasts, enabling more precise early warning systems for extreme weather events.
- **Integrate satellite data and remote sensing technologies:** Leverage satellite imagery and remote sensing data to monitor climate impacts on land, water and ecosystems. This data should be integrated into national and regional information systems to enhance risk assessments, agricultural planning and disaster response.
- **Develop centralised agricultural and climate databases :** Create comprehensive, centralised databases that consolidate data on agricultural productivity, soil health, water availability and climate risks. This would improve access to reliable information for policymakers, farmers and insurers, fostering evidence-based decision-making.
- **Ensure the interoperability of data systems:** Promote the standardisation of data collection and sharing protocols across government agencies, private entities and international organisations. This ensures data interoperability and improves collaboration among stakeholders.

- **Build capacity for data analysis and utilisation:** Train local governments, insurers and other stakeholders in using advanced analytics, machine learning and GIS tools to extract actionable insights from complex datasets.
- **Promote open data policies:** Encourage the development of open data platforms to make climate and agricultural data publicly accessible while maintaining appropriate security measures. This fosters transparency and allows innovation by private and academic sectors.

### Leveraging digitalisation to expand insurance distribution

Digitalisation presents an opportunity to scale insurance access, particularly for underserved populations, by transforming traditional distribution models and reducing costs. Key actions include:

- **Strategic partnerships with Insurtech:** Foster collaborations between insurers and Insurtech companies to innovate distribution models. Mobile-based applications and digital platforms can streamline policy purchase, management and claims processes, reducing barriers such as paperwork and medical tests. For instance, app-based solutions could enable faster policy issuance and claims settlement, enhancing transparency and affordability.
- **Digital payment systems:** Encourage partnerships between insurance providers and mobile money operators to facilitate premium collection and claim disbursements. This model ensures accessibility in remote areas and supports financial inclusion by leveraging mobile money infrastructure.
- **Incentives for digital channels:** Governments should provide regulatory relief or accelerate approval processes for digital insurance solutions. These measures would drive cost reductions and encourage insurers to invest in digital distribution.
- **Improving digital infrastructure:** Work with relevant authorities to enhance connectivity and access in underserved areas. This includes expanding mobile networks and ensuring infrastructure supports digital insurance platforms.
- **Regulatory support for mobile insurance:** Develop frameworks enabling mobile network operators to act as insurance agents. This

regulatory backing would support the growth of mobile-based insurance products and drive innovation in the industry.

underwrite part of the risk, ensuring that viable but high-risk projects can access financing.

## Establishing innovative financial vehicles for adaptation and resilience

Addressing climate adaptation and resilience requires a diversified approach to financing that goes beyond traditional funding mechanisms. Establishing new financial vehicles can unlock targeted investment, incentivise private sector participation and ensure sustainable funding for adaptation initiatives.

Key elements of this recommendation include:

- **Adaptation-focused blended finance mechanisms:**  
Mobilise and/or establish funds that combine public, private and philanthropic capital to de-risk investments in adaptation projects. Public and donor contributions can absorb initial risks, encouraging private investment in climate-resilient infrastructure and services. A country-led investment platform can support the establishment of such structures.
- **Climate adaptation guarantee schemes:**  
Develop guarantee schemes that reduce investment risk for private sector entities engaging in adaptation projects. Governments or multilateral institutions could underwrite part of the risk, ensuring that viable but high-risk projects can access financing.
- **Dedicated municipal adaptation funds:**  
Establish funds at the sub-national level to finance climate resilience projects. These funds should prioritise adaptation mainstreaming into local planning and incentivise projects with clear resilience outcomes.
- **Private sector incentive structures:**  
Develop tax incentives, resilience premiums, or risk-sharing mechanisms to attract private investments in adaptation-focused projects. For example, companies could receive tax breaks for incorporating climate resilience components into infrastructure projects or for participating in public-private partnerships for adaptation
- **Climate adaptation guarantee schemes:**  
Develop guarantee schemes that reduce investment risk for private sector entities engaging in adaptation projects. Governments or multilateral institutions could

## Improve asset management and local government capacity for resilient infrastructure

Local governments are on the frontline of climate change response but often lack the resources and systems to manage climate risks effectively. This means that asset management often lacks the necessary data, tools and capacity to identify, assess and prioritise climate risks, leading to inadequate infrastructure planning and delayed adaptation measures. Here, a key recommendation is to establish comprehensive public asset registries that form the foundation for systematic climate and disaster risk planning. This effort should be complemented by capacity-building initiatives targeting municipalities and local agencies

These registries could focus on:

- **Critical infrastructure:**  
Documenting vulnerable assets such as roads and water systems.
  - Conducting standardised risk assessments, particularly for flooding and other prevalent climate risks.
  - Integrating climate risk data into infrastructure planning processes to align public investments with adaptation priorities.
- **Rural infrastructure management :**  
Cataloguing rural road networks to identify resilience needs for last-mile delivery systems.
  - Linking rural infrastructure planning with existing public-private partnership frameworks to ensure sustainable management.
- **Public-private collaboration for asset management:** The development and maintenance of asset registries and the mainstreaming of resilient infrastructure can benefit significantly from structured public-private partnerships. These partnerships should include insurers, local governments and key ministries, focusing on:
  - Shared risk assessment methodologies and data.

- Integration of insurance mechanisms into municipal climate strategies.
- Joint investment in infrastructure resilience projects.

## Mainstream climate resilience into budget and infrastructure planning

Strengthening climate resilience requires embedding adaptation principles into public infrastructure planning, budgeting and approval processes.

### Key actions include:

- **Climate-adaptive PPPs:** Introduce an “adaptation PPP” category with streamlined approval processes and clear guidelines on risk-sharing mechanisms between public and private entities. Governments could incentivise adaptation by offering tax breaks or preferential terms for infrastructure projects that incorporate significant climate resilience components.
- **Valuation and reporting frameworks:** Develop standardised metrics for measuring adaptation benefits and establish a framework for valuing adaptation projects. These tools would help attract impact investors and green finance by quantifying the benefits of resilience.
- **Resilience premium:** Introduce a “climate-resilience premium” in project evaluation criteria, awarding additional points to proposals that demonstrably enhance adaptive capacity.
- **Capacity building:** Implement training programmes for government officials and private sector partners to strengthen the structuring and implementation of adaptation-focused infrastructure projects.
- **Mandating climate adaptation** Establish climate adaptation requirements in public infrastructure funding mechanisms, ensuring resilience considerations are prioritised across all projects.
- **Establishing country-led investment platforms for adaptation and resilience:** These platforms can help coordinate private and public stakeholders, government agencies and other

resources for a strategic approach to addressing some of the recommendations in these reports.

## Country-specific recommendations

### South Africa:

- **Integrate insurance with existing social protection schemes:** Leverage the infrastructure of the South African Social Security Agency (SASSA) to enhance the accessibility and affordability of insurance, particularly for vulnerable populations.
- **Explore the creation of a climate risk insurance pool for municipalities.** This would help municipalities manage climate-related risks more effectively and provide a collaborative platform for addressing local climate adaptation needs.
- **Mandate climate adaptation and resilience requirements in municipal infrastructure grants.** This would ensure that local government investments are aligned with national climate resilience objectives and encourage municipalities to prioritise climate-resilient infrastructure.

### Kenya:

- **Basis risk fund:** Establish a dedicated basis risk fund to address discrepancies between index payouts and actual farmer losses. This fund could be financed through insurer contributions, government allocations and donor support, with a portion of premiums set aside to build the fund. Clear criteria for fund access and an independent oversight body should be established. Initially pilot the fund in select counties before nationwide implementation, ensuring it complements existing insurance products without overburdening farmers.
- **Link insurance activities with national adaptation policies:** Kenya's enabling regulatory environment creates an opportunity to link insurers' products and investments with the country's NAP and nationally determined contributions, which can facilitate the creation of investment metrics. This alignment can set measurable targets for the insurance sector's climate contributions, climate risk assessments, redirecting investments towards climate-resilient projects and reporting progress annually.



- **Introduce tax incentives for resilience-building investments.** Tax incentives could encourage both public and private sector investments in climate resilience, making it more financially attractive for businesses to engage in adaptation projects.

#### Malawi:

- **Support the development of agricultural index insurance through public-private partnerships.** This would focus on expanding insurance coverage for smallholder farmers by leveraging PPPs, donor funding or climate finance to subsidise premiums and increase affordability.
- **Strengthen digital infrastructure in underserved areas,** ensuring that rural and underserved communities have access to the digital tools needed to engage with climate risk insurance products, particularly mobile-based solutions.
- **Expand microinsurance:** Develop proportionate regulations for microinsurance providers, enabling mobile network operators to serve as insurance agents. This should be accompanied by pilot projects to test new, innovative models of coverage for low-income households.

Each of these recommendations addresses the unique needs and circumstances in each country, reflecting the different stages of market development, infrastructure and policy maturity regarding climate resilience and insurance.

## References

- AfricaRe. (2021). *Country Dashboard South Africa*. <https://arcsa.africa-re.com/dashboards/ZA>
- Atlas. (2022). South Africa: Insurance penetration rate. *Atlas Magazine*. <https://www.atlas-mag.net/en/category/tags/pays/africa-insurance-penetration-rate>
- Camargo, A. (2019). *The role of insurance supervisors in climate risk insurance: Making the vulnerable more resilient to natural disasters* (Financial Systems Approaches to Insurance). Access to Insurance Initiative Secretariat.
- Carleton. (2022, February 28). Climate change in Africa: What will it mean for agriculture and food security? *International Livestock Research Institute*. <https://www.ilri.org/news/climate-change-africa-what-will-it-mean-agriculture-and-food-security>
- CDP. (2023, July 31). *Tropical Cyclone Freddy*. Center for Disaster Philanthropy. <https://disasterphilanthropy.org/disasters/tropical-cyclone-freddy/>
- Changwanda, J., & Clayton, F. (2023, November 20). After the Storm, Malawi's Farmers Face a Precarious Future. *Yale E360*. <https://e360.yale.edu/features/cyclone-freddy-malawi-aftermath>
- Changwanda, J., & Clayton, F. (2024, July 16). Malawi's farmers on the front line of climate change-related storms. *African Arguments*. <https://africanarguments.org/2024/07/malawi-farmers-face-a-precarious-future-from-climate-change-related-storms/>
- Clemens, B., Michael, K., Juneweenex, M., & Jemimah, N. (2024). *Food systems transformation in Kenya: Lessons from the past and policy options for the future Loading... Files Full Book (7.78 MB, pdf) Chapters List (73 KB, pdf) Authors Breisinger, Clemens Keenan, Michael Mbuthia, Juneweenex Njuki, Jemimah Date Issued 2023-12-20 Language en Type Book Review Status Peer Review Access Rights Open Access Open Access Usage Rights CC-BY-4.0 Metadata Sha. Intl Food Policy Res Inst.*
- Detelinova, I., Thomas, T. S., Hammond, W., Arndt, C., & Hartley, F. (2023). *From climate risk to resilience: Unpacking the economic impacts of climate change in Kenya* (0 ed.). International Food Policy Research Institute. <https://doi.org/10.2499/p15738coll2.136953>
- EM-DAT, & CRED. (2024). *EM-DAT Documentation: South Africa*. <https://doc.emdat.be/>
- FEWS NET. (2023). *Cyclone Freddy leads to Crisis (IPC Phase 3) outcomes in southern Malawi* (Food Security Update) [Malawi Food Security Outlook Update, April 2023]. Famine Early Warning Systems Network. <https://fewsn.net/southern-africa/malawi/food-security-outlook-update/april-2023>
- IMF. (2022, June 2). *South Africa: Financial Sector Assessment Program-Technical Note on Insurance Sector—Regulation and Supervision*. International Monetary Fund. <https://www.imf.org/en/Publications/CR/Issues/2022/06/16/South-Africa-Financial-Sector-Assessment-Program-Technical-Note-on-Insurance-Sector-519728>
- IRENA. (2024). *Energy Profile: South Africa*. International Renewable Energy Agency. [https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical\\_Prfiles/Africa/South-Africa\\_Africa\\_RE\\_SP.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Prfiles/Africa/South-Africa_Africa_RE_SP.pdf)
- Kramer, B., Hazell, P., Alderman, H., Ceballos, F., Kumar, N., & Timu, A. G. (2022). Is Agricultural Insurance Fulfilling Its Promise for the Developing World? A Review of Recent Evidence. *Annual Review of Resource Economics*, 14(Volume 14, 2022), 291–311. <https://doi.org/10.1146/annurev-resource-111220-014147>
- Kramer, B., Rusconi, R., & Glauber, J. W. (2020). *Five Years of Regional Risk Pooling: An Updated Cost-Benefit Analysis of the African Risk Capacity* (IFPRI Discussion Paper 01965 No. 3716342; Markets, Trade and Institutions Division). Social Science Research Network. <https://papers.ssrn.com/abstract=3716342>
- Kreft, S., & Kohler, D. (2019). *Climate Risk Insurance: From Policy to Practice*.
- Marchal, R. (2021). *The role of the recovery funding gap in post-cyclone Idai Malawi: An explorative analysis* [Master of Arts]. Ghent University.
- Mbebe, S., Rahman, P., Tredoux, A., & Dobson, B. (2024, February). *Exploring Operational Pathways for Article 2.1(c) of the Paris Agreement in Africa: A Case of High Carbon Financial Assets and Financial Sector Transformation in South Africa*. SouthSouthNorth. <https://southsouthnorth.org/wp-content/uploads/2021/11/A-Case-of-High->

Carbon-Financial-Assets-and-Financial-Sector-Transformation-in-South-Africa.pdf

MunichRe. (2024, October 14). *The price of natural catastrophes in Africa: Insights into the most recent losses* | Munich Re.

<https://www.munichre.com/en/insights/natural-disaster-and-climate-change/price-of-natural-catastrophes-in-africa.html>

Nicolson, K., Broermann, S., Folscher, A., Mutimba, S., Tchane, Y., & Zaky, M. (2023). *Planning Africa's Adaptation Finance: Estimating and Reducing Country Level Adaptation Gaps* (L. Baumgartner, Ed.). United Nations Development Programme (UNDP). <https://doi.org/10.18356/9789213588727>

Njeru, T. N. (2024, May 9). *Kenya floods: As the costs add up pressure mounts on a country in economic crisis*. The Conversation. <http://theconversation.com/kenya-floods-as-the-costs-add-up-pressure-mounts-on-a-country-in-economic-crisis-229636>

The World Bank Group. (2021). *South Africa Social Assistance Programs and Systems Review* [Policy Briefing]. World Bank Group. <https://www.sassa.gov.za/newsroom/Documents/South%20Africa%20Social%20Assistance%20Progra>

ms%20and%20Systems%20Review%20Policy%20Brief.pdf

UNEP. (2023). *Adaptation Gap Report 2023: Underfinanced. Underprepared. Inadequate investment and planning on climate adaptation leaves world exposed* (Adaptation Gap Report). United Nations Environment Programme. <https://doi.org/10.59117/20.500.11822/43796>

WFP. (2023, November). *R4 Rural Resilience Initiative (R4)*. World Food Programme. [https://docs.wfp.org/api/documents/WFP-0000130011/download/?\\_ga=2.156042875.1126074444.1714651048-1192137138.1714060952](https://docs.wfp.org/api/documents/WFP-0000130011/download/?_ga=2.156042875.1126074444.1714651048-1192137138.1714060952)

You, L., & Shee, A. (2022, October). *Promoting Resilience and Food Security through Risk-Contingent Credit in Africa*. InsuResilience Secretariat. [https://www.insuresilience.org/wp-content/uploads/2022/11/CaseStudy\\_Kenya\\_FINALE.pdf](https://www.insuresilience.org/wp-content/uploads/2022/11/CaseStudy_Kenya_FINALE.pdf)

Ziervogel, G., Lennard, C., Midgley, G., New, M., Simpson, N. P., Trisos, C. H., & Zvobgo, L. (2022). *Climate change in South Africa: Risks and opportunities for climate-resilient development in the IPCC Sixth Assessment WGII Report*. *South African Journal of Science*, 118(9/10). <https://doi.org/10.17159/sajs.2022/14492>

## Annex 1: Definitions of key terms

Concept	Definition
<b>Adaptation</b>	Adaptation refers to the actions and strategies designed to adjust systems, processes and behaviours to mitigate the negative impacts of climate change. This includes measures aimed at building resilience to both sudden climate shocks like floods and storms and slower-onset impacts such as prolonged droughts, rising temperatures and sea level rise. Adaptation seeks to protect lives, livelihoods and infrastructure, while ensuring communities and economies can thrive despite changing climate conditions.
<b>Adaptation</b>	Adaptation financing is the financial support provided to implement these adaptation measures. It is a subset of climate finance, specifically aimed at enhancing the resilience of communities, ecosystems and economies to the impacts of climate change.
<b>Basis risk</b>	The biggest is basis risk, that is, the risk of mismatch between the payout as measured by an index and the actual loss incurred by the policyholder
<b>Climate risk insurance</b>	Climate risk insurance involves a legally binding contract where the insured party (which could be a government, organisation, or individual) pays a premium to transfer the risk of a potential weather-related event to an insurer. The contract specifies the amount of coverage and the period for which it is valid.
<b>Climate risk management</b>	The process involves identifying, assessing and prioritising risks related to climate change, followed by coordinated efforts to minimise, monitor and control the impact of these risks.
<b>Climate Vulnerability</b>	Climate vulnerability refers to the susceptibility of societies and systems to the adverse effects of climate change, including variability and extremes. Vulnerability encompasses the human dimension of disasters, mediated by access to resources needed to adapt to and cope with climate shocks. It includes both the external environmental stresses and shocks to which societies and systems are subjected, as well as the internal capacity of households and communities to adapt to and cope with climate shocks.
<b>Disaster risk reduction</b>	Strategies and practices aimed at reducing the damage caused by natural hazards include prevention, mitigation and preparedness measures.
<b>Exposure</b>	This involves the presence of people, infrastructure, dwellings, productive capabilities and other tangible human assets in areas susceptible to hazards
<b>Hazard:</b>	Hazards refer to any process, phenomenon, or human activity that can lead to loss of life, physical injury, health impacts, property damage, social and economic disruptions, or environmental degradation. Hazards may originate from natural, human-made, or combined socio-natural sources.
<b>Indemnity insurance</b>	Indemnity insurance covers the loss of actual physical assets, whether privately or publicly owned. These assets can range from houses and factories to roads and hospitals. The key principle is that the assets have a known reconstruction value, allowing them to be insured against specific costs of repair or replacement. The price of the insurance policy depends on the asset's value and the likelihood of damage, with higher premiums for high-value assets in high-risk areas.
<b>Insurance penetration</b>	The contribution of insurance premiums to a country's economy, expressed as a percentage of the GDP. It measures the extent to which insurance services are used within an economy.
<b>Insurance density</b>	Measures the average per capita spending on insurance in a given country or region. It is calculated as the ratio of <b>gross written premiums</b> to the <b>population</b> . Reflects how much, on average, individuals in a country spend on insurance products annually.
<b>Livelihood assets</b>	Resources people use to develop a range of livelihood strategies are influenced by the prevailing social, institutional and organisational contexts, which include policies, institutions and processes. This environment significantly influences the livelihood strategies available to individuals as they seek to achieve their own beneficial livelihood outcomes.

<b>Livelihood shocks and stresses</b>	Households, communities, groups and regions are vulnerable to varying shocks and stresses. Stresses are continuous and cumulative pressures that build up over time, often predictable and persistent, such as declining resources, gradual environmental degradation, or socioeconomic pressures like falling wages and increased competition for resources. These stresses can slowly erode the resilience of communities by consistently challenging their ability to maintain stable livelihoods. Shocks, by contrast, are sudden, unpredictable events that can cause immediate and severe disruptions. These include natural disasters like floods or earthquakes, economic crises, or sudden conflicts. Shocks can have a dramatic and immediate impact on livelihoods, often requiring urgent and substantial responses to recover from the damage they cause.
<b>Livelihood strategies:</b>	Livelihood strategies include the various activities and choices that people engage in to achieve their livelihood goals. This is a dynamic process where individuals mix different activities to satisfy their needs at varying times. Household members may reside and work in different locations, either temporarily or permanently. These strategies are directly influenced by asset status and the aforementioned policies, institutions and processes, leading to competition among the poor and potential impacts (both positive and negative) between different households' strategies.
<b>Parametric/index-based insurance</b>	Parametric or index-based insurance products differ from indemnity insurance in that they are not tied to the actual losses of physical assets. Instead, they provide payouts based on pre-agreed parameters or indices related to the type and severity of a disaster. This form of insurance uses indices such as rainfall levels, temperature, or crop yields measured over a specific area to trigger payouts. Given that this type of insurance does not require extensive resources for assessing and quantifying losses, transaction costs are lower, which implies lower risk premiums. Payouts can also be made faster, helping avoid distressed asset sales and mitigating humanitarian crises that can follow a disaster. To this end, index-based insurance products are particularly suitable for low-income countries with low insurance penetration.
<b>Physical risks</b>	Direct risks from climate change impacts such as extreme weather events that can cause physical damage to assets and infrastructure.
<b>Resilience</b>	The ability of a system, community, or society to withstand and recover quickly from climate-related shocks and stresses.
<b>Risk retention</b>	The strategy of managing risk by retaining responsibility for potential losses rather than transferring them to an insurer. This involves setting aside funds to cover potential losses.
<b>Risk transfer</b>	The process of shifting the financial burden of risk from one party to another, typically through insurance or reinsurance contracts.
<b>Transition risks</b>	Risks associated with the shift towards a low-carbon economy, including policy changes, technological advancements and shifts in market preferences that can affect investments and business operations.
<b>Trigger:</b>	Payouts are triggered when specific, pre-defined event parameters are met or exceeded. These parameters are measured by an index, such as wind speed for cyclones or rainfall volume for floods. These triggers can be designed using weather-based indices, satellite-based data or yield-based triggers.

## Annex 2: Agriculture insurance market segmentation

The farmer typology used in this analysis draws on the work of Kramer et al., (2022) who developed a segmentation of farm households in developing countries that categorises the risks different farmers face as well as four main insurance market segments (Kramer et al., 2022).

### Risk layers

Insurers categorise risks based on the potential size of a loss and its likelihood of occurrence. In a normal (Gaussian) probability distribution (hump-shaped distribution of outcomes), all results below the mean represent losses or downside risks, which are significant for risk-averse stakeholders. These downside risks can be divided into three layers:

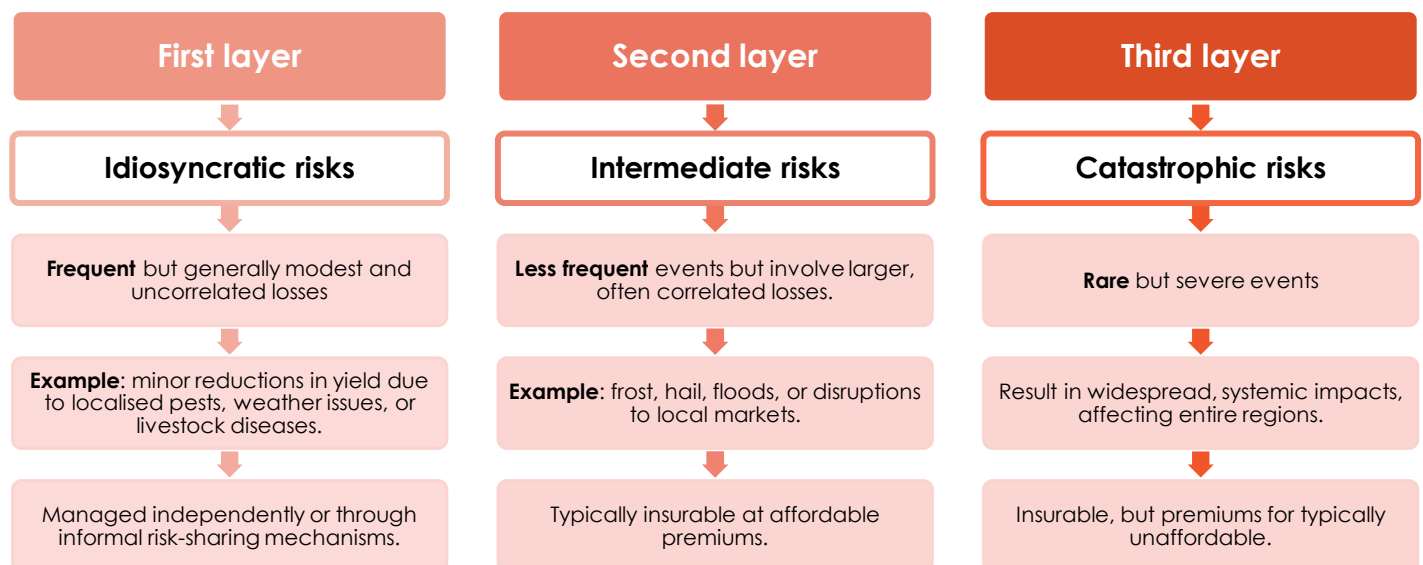
- **First-layer:** Frequent but low-impact losses.
- **Second-layer:** Less frequent but larger losses.
- **Third layer:** Infrequent but catastrophic risks.

The segmentation of agricultural insurance risks enables an understanding of the risk management needs farmers face across the global South. However, these needs are not homogenous and if insurance is used to strengthen climate resilience, schemes should be designed to align products and delivery mechanisms with the specific needs and capabilities of different farmer groups.

### Farmer typology

The farming household typology considers the **resources and coping mechanisms** available to different types of farmers, which is linked to their socio-economic status and integration into markets (Kramer et al., 2022). It divides households into the following groups:

Figure 5: Risk layers in agricultural losses



### Group 1: Chronically poor agricultural households

These are near-landless workers and small-scale subsistence farmers, typically in remote areas with limited agricultural potential. Their marginalisation and restricted access to non-farm employment creates high vulnerability to risks. Limited assets constrain their ability to manage losses or purchase insurance. They primarily benefit from social protection initiatives, including safety net programmes (SNPs) and disaster assistance programmes (DAPs).

## **Group 2: Non-poor, subsistence-oriented farm households**

While avoiding chronic poverty, these farmers maintain weak market integration. Though more resilient than Group 1, they risk falling into poverty from repeated income shocks or asset losses. Subsidised insurance could prevent downward mobility and potentially facilitate transition to commercial farming.

## **Group 3: Commercially oriented small farms**

These farmers, integrated into value chains, face elevated market and production risks but typically have access to savings and credit facilities to manage losses. They often use bundled insurance solutions from financial providers or agribusinesses, combined with credit or modern input services.

## **Group 4: Medium and large commercial farms**

These operations face substantial production and market risks but possess comprehensive risk management options. Well-served by private insurers, they can afford catastrophe insurance and commonly access coverage through financial service providers.

In the case study reports, we examine how different insurance schemes serve these distinct farmer segments, focusing on government programmes, private sector products, meso-insurance and regional risk pooling schemes. Throughout the discussion, this typology helps identify how different insurance mechanisms align with varying risk management needs and capabilities, while also highlighting persistent gaps in coverage and areas where innovations are still needed.