Policy Note: Agriculture risk financing in Southern Africa

Output of Regional ASA: Southern Africa—Developing a Regional Risk Financing Framework for Agriculture and Food Security (P170807)

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Executive Summary

The agricultural sector\(^1\) across Southern Africa is exposed to severe shocks, including from weather events, price volatility, pests and diseases. Drought is the most important natural hazard for agricultural producers in the region, affecting more than 80 million people over the last 20 years. This is followed by floods and tropical cyclones which also affect large numbers of people. It is estimated that on average, around 8 percent of crop and livestock production is lost to weather risk in Southern Africa. Climate scientists predict that Southern Africa will be severely affected by a warming climate, and that extreme climate events will further increase in frequency and severity. Besides weather risk, inter- and intra-annual price volatility present significant challenges to consumers spending over 50 percent of their income on food, as well as to producers who lack the certainty to be able to make costly investment decisions, or who may face limited access to credit markets. Regional price volatility for maize, the most important staple crop in the region, is among the highest in the world. Finally, pests and diseases also pose a critical problem for many producers. Across sub-Saharan Africa, up to 30 percent of the annual maize harvest is lost to pests and diseases. Animals are likewise affected, with a range of diseases endemic in the region.

Given high vulnerability, economic impacts for the agricultural sector and the region overall are often catastrophic, with severe consequences on food security. Agriculture is the most important sector of the Southern African Development Community (SADC) region, employing over half of the total SADC workforce and contributing around a quarter of Gross Domestic Product (GDP) in the poorest countries. However, it is highly vulnerable to external shocks: More than half of the SADC population still lives below the international poverty threshold of US$1.90 per day, most of whom are smallholder farmers. Farm size rarely exceeds 5 ha and only 7 percent of cultivated land is irrigated, making most farmers entirely dependent on rainfall. The level of food insecurity is persistently high.

In 2020, SADC economies are facing particularly adverse conditions as the region has suffered a series of devastating weather shocks, and the COVID-19 pandemic is compounding the effects. Since 2015, Southern Africa has experienced various drought years, floods, and cyclones, including the strongest cyclone ever measured on the African continent. The region is in the midst of one of the worst food crises worldwide—since 2016, on average around 35 million people every year have been food insecure, around 10 percent of the regional population. Some countries have been more affected than others—for example, in selected years, food insecurity in Zimbabwe has affected over 50 percent of the population. In 2020, some of these effects are likely to be exacerbated by the COVID-19 pandemic. While the exact effects are still hard to predict, negative economic impacts, particularly in the commodities, tourism, and trade sectors, will have consequences on economies and food insecurity (through price volatility, for example). The IMF estimates that SADC GDP will shrink by about 3.9 percent in 2020.

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\(^1\) By “agriculture” and “agriculture sector”, this policy note refers to the entire food system: agriculture inputs, agriculture production (crops and livestock), post-harvest processing/agri-food businesses, as well as food consumption and food security implications.
While the exact financial and economic costs of agricultural shocks are difficult to quantify, it is clear that they are of enormous proportions, and funding for response is often insufficient. Natural hazards in the SADC region have caused at least US$10 billion in damages over the last 20 years. Countries were often unable to mobilize sufficient resources to respond, instead turning to external assistance. Thus, humanitarian donors have provided an annual average of more than US$880 million per year to low- and lower middle-income countries in the region, or 0.5 percent of their aggregate GDP. Overall needs are likely to have been much higher: the figure excludes internal government allocations, and humanitarian appeals data shows that the average funding of national appeals amounted to only 57 percent over the last 20 years. In other words, an average of 43 percent of national appeals—more than US$8 billion—remained unfunded. This is also indicative of the frequent shortcomings of ex-post donor funding for crisis response: it can be slow to mobilize and the ultimate amount received is variable and often insufficient.

When integrated in an overall agricultural risk management framework, a national disaster risk financing strategy is a useful tool to increase a country’s financial resilience to shocks. DRF strategies outline how different financing mechanisms can be used to provide funding for crisis response across vulnerable sectors. They are elaborated in advance during non-crisis times and can comprise DRF instruments such as contingency funds and reserves, contingent loans and risk transfer solutions, including insurance. Naturally, they are not stand-alone solutions to shock response, but only address how the response is financed. Other risk management measures, including for risk identification, risk reduction, preparedness building, and recovery, are also essential.

Countries around the world, including in Africa are increasingly adopting DRF strategies, including for agriculture, in recognition of the benefits of financial planning. Planning ahead how to cover the costs of a potential shock can ensure that funds are available faster, at lower cost, in a more predictable fashion, and with greater accountability. Countries around the world are increasingly establishing DRF strategies to manage their financial exposure to external shocks, such as natural hazards. In Africa, the emergence of the African Risk Capacity (ARC) is a testament to the increased use of DRF instruments. Some countries such as Kenya and Malawi have already embarked on using a comprehensive mix of pre-arranged financing mechanisms, with specific focus on the agriculture sector, to improve financial management of climatic perils such as drought and flooding, in addition to agriculture insurance programs strengthening the financial resilience of farmers and herders.

At the national level, while SADC Member States use risk financing instruments to protect themselves from the impacts of agriculture risks, overall financial resilience remains low. Almost all SADC Member States have some agriculture risk financing mechanisms in place, albeit with varying degree of effectiveness, comprehensiveness, and suitability to those who would benefit most. Most countries, for example, keep grain stocks that they may use as a reserve during food crises and as a market intervention mechanism, to try to stabilize surging grain prices. Many also have a national reserve in place, but it is not always operational. Over the last decade, some SADC Member States have experimented with different agriculture risk financing approaches, including national DRF assessments and strategies, agricultural insurance schemes, shock-responsive safety nets, contingent credit schemes, and sovereign risk
transfer. However, the overall level of financial coverage for agriculture sector risks through prearranged financial solutions remains low.

**Agricultural insurance schemes are important national instruments.** Many countries worldwide and in the SADC region have tried to establish such schemes to protect their farming population, with varying degrees of success. Based on international experience, national agricultural insurance schemes are most successful when organized as public-private partnerships (PPP). This implies that certain roles are best taken on by the private sector—e.g., the marketing and distribution of insurance products via commercial insurance companies—and others by the public sector—e.g., the design of supportive legal and regulatory frameworks. The private and the public sectors need to work together to develop a comprehensive approach for programs to achieve scale sustainably.

**At the regional level, there is a strong rationale for countries to act together, and SADC Member States are starting to debate the use of risk financing solutions across national borders.** Benefits from acting regionally include, among others: (i) better coordination of shock response during regional emergencies; (ii) potentially significant cost-effectiveness gains via economies of scale and risk pooling benefits; (iii) knowledge sharing among countries to derive lessons learned on innovation, market creation for agricultural insurance schemes and disaster risk management policy alignment; and (iv) regional leadership and capacity building to incentivize the uptake of more efficient and effective financing solutions. Against this background, different regional agriculture risk financing initiatives have started to emerge at the SADC level. Recent initiatives include different regional workshops on DRF as well as a memorandum of understanding signed with the African Risk Capacity (ARC) to strengthen collaboration on the issue. Emerging regional policy documents also call for the inclusion of DRF instruments in national risk management frameworks. In 2017, the SADC Council of Ministers also called for a disaster fund at the regional level, but this has not yet been developed.

**This policy note makes seven recommendations for countries in the SADC region and the SADC Secretariat to better leverage agriculture risk financing opportunities and increase financial resilience:**

1. **Strengthen existing national food and contingency reserves, and budgetary systems.** Countries in the region should begin by strengthening existing agriculture risk financing mechanisms, especially those that are targeted at financing more frequent, less severe shocks—including disaster funds, food reserves, and shock-responsive safety nets. Recurrent areas to strengthen include disbursement rules and access triggers, funding levels, and clear rules regarding the use of funds. For example, reporting requirements on the contingency reserve in the national budget in South Africa could be strengthened to increase transparency on disbursements. Where national disaster funds have been set up but are not fully functional, like in Eswatini, the focus should be on operationalizing and financing them.

2. **Build effective and suitable national agricultural insurance programs.** Agricultural insurance can be a powerful tool, as part of a broader agricultural risk management framework, to boost agricultural output and shield farmers from production shocks. In many low- and middle-income contexts, it has helped to lower the risk to the agricultural sector and facilitated the expansion of agricultural credit that could previously not be accessed by farmers.
This enables investment in and adoption of modern farming techniques. Countries should explore building national public-private partnerships systems to help schemes targeting small- and medium-scale farmers and enterprises to be sustainable and scale up. Regional South-South exchange on lessons learned and success stories can speed up the development of national systems and provide incentives for private partners to extend services in more countries.

3. **Consider improving the national financial management of agriculture shocks through the coordinated use of risk financing instruments.** Countries should consider conducting national DRF diagnostics and adopting national DRF strategies. National DRF diagnostics help quantify the financial exposure of the agriculture sector and others to shocks. They also provide recommendations on the optimal use of DRF instruments such as contingent credit lines, agricultural insurance programs, or sovereign insurance, to finance the costs associated with such shocks. Building on such analysis, countries could then adopt national DRF strategies that lay out which DRF instruments the country would use and how their costs would be financed.

4. **Strengthen the coordination and policy function of the SADC Secretariat on agriculture risk financing.** The SADC Secretariat can use its comparative advantages to support regional policy and harmonization efforts to enable an effective agriculture risk financing framework for the SADC region. For example, the Secretariat can shape regional policy to advocate for and support adoption of agriculture risk financing instruments by member states; it can facilitate regional harmonization of insurance regulation to enable the expansion of index insurance programs targeting emerging farmers; it can develop standing contingency plans for regional food crises to ensure a well-coordinated response. The potential for regional development policy operations from multilateral development banks could be explored to strengthen the regional policy agenda.

5. **Focus on building or strengthening technical capabilities on agriculture risk management, including risk finance.** Given the critical importance of agriculture risk financing for the development and economic growth agenda in SADC Member States, the SADC Secretariat could expand its capacity building services for agriculture risk management to include agriculture risk financing, both individually for member countries and knowledge exchange at the regional level. The SADC Secretariat could, for example, support countries in (among other things): (i) the development of standardized and comparable risk profiles for agriculture-related shocks; (ii) building capacity on technical issues related to agriculture risk financing; (iii) share best practice guidance and facilitate South-South knowledge exchange on formation of agriculture risk financing strategies and policy; and (iv) pool national/subnational data to develop a monitoring platform for weather events, price variations, disease outbreaks, food stocks, and populations at risk, which could enable more effective early warning systems across the region.

6. **Regional strategic food reserve.** The concept of a regional strategic food reserve for the SADC region to leverage economies of scale and risk-sharing benefits has been discussed for many years. Disagreements among Member States on governance, access rules, and contributions seem to have prevented its establishment thus far. However, given the ongo-
ing food crisis, the potential compounding impact of the COVID-19 pandemic on food insecurity, and the emerging new focus on agriculture risk financing solutions in the region, the idea merits renewed consideration.

7. **Explore regional agriculture risk financing instruments.** SADC Member States could explore the options for pooling agricultural risks at the regional level and develop a suite of risk financing instruments to strengthen financial resilience. Instruments such as a regional contingent line of credit (with earmarked country allocations) or regional sovereign insurance could be explored. Such risk pools could benefit small member countries that share similar characteristics in terms of vulnerability to particular shocks, or a similar segmentation of commercial and smallholder farmers.
Introduction

This policy note is provided as an output under the World Bank’s Regional Advisory Service for Southern Africa, “Developing a Regional Risk Financing Framework for Agriculture and Food Security” (P170807). A key objective of this advisory service is to inform the public sector in Southern Africa on improvements to agriculture and food security risk financing policies and programs. The note is an output under Component 2 of the project, which aims to identify agriculture risk financing policy options.

The note aims to take stock of selected key financial risks affecting the agriculture sector in the Southern Africa Development Community (SADC) region and provide options to build financial resilience. Weather risks, price volatility, and pests and diseases are among the most important shocks affecting agricultural producers in the region, frequently with severe consequences for food security. This note gives (i) an overview of their regional impact in terms of economic and financial cost, as well as effects on food security; (ii) describes the status quo of use of agriculture risk financing instruments by countries in the region; and (iii) derives policy recommendations to further improve financial resilience to agricultural shocks using agriculture risk financing instruments. It should be noted that risk financing instruments are only one part of a comprehensive agriculture risk management approach. Other complementary agriculture risk management mechanisms and approaches, such as the development of commodity exchanges, agriculture trade policy, or warehouse receipt systems, are not the focus of this note.

This note is intended to add to the policy discussion in the context of the wider ongoing dialogue on agriculture risk financing in the SADC region, at the regional policy and program level. The agriculture risk finance agenda has gained momentum in the SADC region in recent years, with governments moving away from an ex-post to an ex-ante funding approach of financial risks to the agriculture sector.

The note is structured in three parts. Part 1 presents an overview of the agriculture sector in the SADC region and describes the occurrence and the financial impact of key shocks to the agriculture sector. Part 2 takes stock of existing agriculture risk financing initiatives in the region, both at national and regional levels. Part 3 presents recommendations and concludes.

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2 By “agriculture” and “agriculture sector”, this policy note refers to the entire food system: agriculture inputs, agriculture production (crops and livestock), post-harvest processing/agri-food businesses, as well as food consumption and food security implications.
1. Regional impact of selected agriculture risks

1.1 Regional overview of the agriculture sector

1. Agriculture is the backbone of most Southern African economies. The sector employs over half of the Southern African Development Community’s (SADC) labor force and contributes 9 percent of regional GDP (World Development Indicators). It provides about 13 percent of total export earnings (SADC, 2008). In six of the 16 countries in SADC, agriculture, forestry and fisheries contribute more than 19 percent of national GDP. Countries with the highest agriculture share in GDP include The Comoros (31 percent), Madagascar (28 percent), Tanzania (27 percent), Malawi (26 percent), and Mozambique (24 percent). In 10 countries, more than 48 percent of the labor force work in the sector. For low- and lower-middle-income countries (LICs and LMICs), agriculture contributes 24 percent and 14 percent of regional GDP, respectively. In LICs in the region, about two thirds of the labor force work in agriculture (Table 1).

Table 1: Key agriculture metrics for SADC Member States

<table>
<thead>
<tr>
<th>WBG category</th>
<th>Agriculture, value added, % of GDP (average 2012-17)</th>
<th>Employment in agriculture, % of national employment (average 2015-19)</th>
<th>Rural population, % of total (2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>LMIC</td>
<td>8.2</td>
<td>49.2</td>
</tr>
<tr>
<td>Botswana</td>
<td>UMIC</td>
<td>2.2</td>
<td>23.2</td>
</tr>
<tr>
<td>The Comoros</td>
<td>LMIC</td>
<td>30.8</td>
<td>57.0</td>
</tr>
<tr>
<td>DRC</td>
<td>LIC</td>
<td>19.2</td>
<td>68.8</td>
</tr>
<tr>
<td>Eswatini</td>
<td>LMIC</td>
<td>9.4</td>
<td>13.1</td>
</tr>
<tr>
<td>Lesotho</td>
<td>LMIC</td>
<td>5.6</td>
<td>67.2</td>
</tr>
<tr>
<td>Madagascar</td>
<td>LIC</td>
<td>27.5</td>
<td>72.0</td>
</tr>
<tr>
<td>Malawi</td>
<td>LIC</td>
<td>26.0</td>
<td>68.4</td>
</tr>
<tr>
<td>Mauritius</td>
<td>UMIC</td>
<td>3.3</td>
<td>7.2</td>
</tr>
<tr>
<td>Mozambique</td>
<td>LIC</td>
<td>23.9</td>
<td>71.8</td>
</tr>
<tr>
<td>Namibia</td>
<td>UMIC</td>
<td>6.7</td>
<td>20.7</td>
</tr>
<tr>
<td>Seychelles</td>
<td>HIC</td>
<td>2.2</td>
<td>NA</td>
</tr>
<tr>
<td>South Africa</td>
<td>UMIC</td>
<td>2.2</td>
<td>5.3</td>
</tr>
<tr>
<td>Tanzania</td>
<td>LIC</td>
<td>27.0</td>
<td>66.9</td>
</tr>
<tr>
<td>Zambia</td>
<td>LMIC</td>
<td>6.6</td>
<td>54.2</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>LMIC</td>
<td>8.3</td>
<td>67.2</td>
</tr>
<tr>
<td>Regional share</td>
<td>All</td>
<td>9.2</td>
<td>NA</td>
</tr>
</tbody>
</table>

LIC | 24.1 | 68.9 | -
LMIC | 14.2 | 55.1 | -
UMIC | 2.4  | 6.7  | -
As per 2019 classification by the World Bank; LIC = Low-income country; LMIC = Lower middle-income country; UMIC = Upper middle-income country.

Source: Calculated from World Bank, World Development Indicators.

2. **The contribution of the agriculture sector of each country to the overall economy of the region differs significantly, South Africa being the agriculture powerhouse of the region.** South Africans contribute less than 2 percent of the SADC agriculture labor force, but 12 percent of regional agricultural GDP. South Africa produces more milk, fruit, and sugar than any other country in SADC, and about 17 percent of all maize produced in Africa (SADC, 2017). Zimbabweans represent only 6 percent of the SADC agricultural labor force but generate 20 percent of agricultural GDP; Angolans represent 8 percent and produce 16 percent. Conversely, the Democratic Republic of Congo (DRC) provides 25 percent of SADC’s agricultural workers but produces only 11 percent of regional agricultural GDP. Mozambique and Madagascar each represents 12 percent of the regional agricultural labor force but only provide 6 percent and 5 percent, respectively, to regional agricultural GDP (Figure 1).

**Figure 1: Country contributions to regional GDP sorted by country share of the SADC agricultural workforce**

![Chart showing country contributions to regional GDP](source: Calculated from World Bank, World Development Indicators)

3. **Southern Africa has a varied ecology with many different farming systems producing a wide range of agriculture commodities.** The SADC region covers 9.6 million km² and stretches from dense Central African forests in the North to arid and semi-arid lands in the South. About 42 percent of it are covered by forest and about 44 percent of the land is agricultural land. The varying ecological systems are being taken advantage of by an array of farming systems. Regional diversity in the production of agricultural commodities is high. It ranges from economies with important cassava and plantain cultivation (e.g., Angola, DRC, and The Comoros) to livestock-based economies in Namibia and Botswana, to sugar cane-focused countries in Eswatini and Mauritius, and to the widely diversified agricultural economy of South Africa (Table 2).

**Table 2: Main agricultural commodities in the SADC region, share of total national agricultural gross production value (GPV), average 2012–2016 (in %)**

*Table data*
<table>
<thead>
<tr>
<th>Country</th>
<th>Bananas</th>
<th>Cassava (meat and dairy)</th>
<th>Cattle (meat and dairy)</th>
<th>Grown nuts with shell</th>
<th>Maize</th>
<th>Meat indigenous, chicken</th>
<th>Potatoes</th>
<th>Sugar cane</th>
<th>Tobacco, unmanufactured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>37%</td>
<td>28%</td>
<td>0.3%</td>
<td>3%</td>
<td>5%</td>
<td>2%</td>
<td>4%</td>
<td>0.4%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Botswana</td>
<td>NA</td>
<td>NA</td>
<td>70%</td>
<td>0%</td>
<td>0.2%</td>
<td>3%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>The Comoros</td>
<td>22%</td>
<td>11%</td>
<td>11%</td>
<td>0.7%</td>
<td>1%</td>
<td>1%</td>
<td>0.2%</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>DRC</td>
<td>6%</td>
<td>37%</td>
<td>5%</td>
<td>3%</td>
<td>0.3%</td>
<td>0%</td>
<td>0.2%</td>
<td>6%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Eswatini</td>
<td>0.4%</td>
<td>NA</td>
<td>6%</td>
<td>0.4%</td>
<td>4%</td>
<td>3%</td>
<td>0.3%</td>
<td>69%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Lesotho</td>
<td>NA</td>
<td>NA</td>
<td>49%</td>
<td>NA</td>
<td>7%</td>
<td>0%</td>
<td>12%</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Madagascar</td>
<td>3%</td>
<td>16%</td>
<td>29%</td>
<td>0.6%</td>
<td>1%</td>
<td>3%</td>
<td>2%</td>
<td>4%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Malawi</td>
<td>4%</td>
<td>21%</td>
<td>5%</td>
<td>4%</td>
<td>15%</td>
<td>1%</td>
<td>16%</td>
<td>2%</td>
<td>7%</td>
</tr>
<tr>
<td>Mauritius</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>0.1%</td>
<td>0%</td>
<td>31%</td>
<td>1%</td>
<td>57%</td>
<td>0%</td>
</tr>
<tr>
<td>Mozambique</td>
<td>0%</td>
<td>15%</td>
<td>16%</td>
<td>4%</td>
<td>7%</td>
<td>3%</td>
<td>0.6%</td>
<td>7%</td>
<td>2%</td>
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<tr>
<td>Namibia</td>
<td>NA</td>
<td>NA</td>
<td>54%</td>
<td>0%</td>
<td>2%</td>
<td>0.3%</td>
<td>0.5%</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Seychelles</td>
<td>14%</td>
<td>0.5%</td>
<td>0.6%</td>
<td>NA</td>
<td>NA</td>
<td>11%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>South Africa</td>
<td>1%</td>
<td>NA</td>
<td>29%</td>
<td>0%</td>
<td>2%</td>
<td>21%</td>
<td>5%</td>
<td>4%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Tanzania</td>
<td>8%</td>
<td>7%</td>
<td>13%</td>
<td>6%</td>
<td>5%</td>
<td>0.6%</td>
<td>3.9%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Zambia</td>
<td>0%</td>
<td>5%</td>
<td>39%</td>
<td>4%</td>
<td>15%</td>
<td>4%</td>
<td>0.3%</td>
<td>5%</td>
<td>11%</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>2%</td>
<td>1%</td>
<td>29%</td>
<td>2%</td>
<td>10%</td>
<td>8%</td>
<td>0.5%</td>
<td>2%</td>
<td>23%</td>
</tr>
<tr>
<td>Regional</td>
<td>6%</td>
<td>9%</td>
<td>21%</td>
<td>2%</td>
<td>5%</td>
<td>8%</td>
<td>4%</td>
<td>4%</td>
<td>3%</td>
</tr>
</tbody>
</table>

*The selected commodities are those with the largest regional share in GPV. Grapes were excluded as their significance is largely concentrated on only Namibia and South Africa.

Source: Food and Agriculture Organization Corporate Statistical Database (FAOSTAT).
4. **Maize is the single most important food crop in the SADC region.** Maize covers more than 40 percent of the total harvested cropping area in seven of the 16 SADC Member States, and more than 20 percent in 11 countries. Across the whole region, maize accounts for 30 percent of the total harvested cropping area and for 13 percent of total regional crop production. Besides maize, cassava, rice, sorghum and wheat represent important foodstuffs for the region (Tables 3 and 4). The importance of maize in the region can also be seen when examining related household budget expenditure and income in the region: For example, households in Malawi, Tanzania and Zambia spend on average between 16 and 21 percent for maize alone, while 12 to 21 percent of their income comes from maize sales (Chauvin et al., 2017).

Table 3: Main crops in the SADC region, share of total harvested area, average 2014–2018 (in %)\(^a\)

<table>
<thead>
<tr>
<th></th>
<th>Cassava</th>
<th>Maize</th>
<th>Rice, paddy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>14%</td>
<td>42%</td>
<td>1%</td>
</tr>
<tr>
<td>Botswana</td>
<td>NA</td>
<td>44%</td>
<td>NA</td>
</tr>
<tr>
<td>The Comoros</td>
<td>10%</td>
<td>3%</td>
<td>21%</td>
</tr>
<tr>
<td>DRC</td>
<td>35%</td>
<td>23%</td>
<td>11%</td>
</tr>
<tr>
<td>Eswatini</td>
<td>NA</td>
<td>43%</td>
<td>0%</td>
</tr>
<tr>
<td>Lesotho</td>
<td>NA</td>
<td>63%</td>
<td>0%</td>
</tr>
<tr>
<td>Madagascar</td>
<td>13%</td>
<td>7%</td>
<td>34%</td>
</tr>
<tr>
<td>Malawi</td>
<td>5%</td>
<td>35%</td>
<td>1%</td>
</tr>
<tr>
<td>Mauritius</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Mozambique</td>
<td>19%</td>
<td>29%</td>
<td>5%</td>
</tr>
<tr>
<td>Namibia</td>
<td>NA</td>
<td>7%</td>
<td>NA</td>
</tr>
<tr>
<td>Seychelles</td>
<td>1%</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>South Africa</td>
<td>NA</td>
<td>45%</td>
<td>0%</td>
</tr>
<tr>
<td>Tanzania</td>
<td>5%</td>
<td>23%</td>
<td>7%</td>
</tr>
<tr>
<td>Zambia</td>
<td>7%</td>
<td>48%</td>
<td>1%</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>2%</td>
<td>51%</td>
<td>0%</td>
</tr>
<tr>
<td>Regional</td>
<td>13%</td>
<td>30%</td>
<td>6%</td>
</tr>
</tbody>
</table>

\(^a\) Crops were selected as the three crops with the greatest share of average total regional harvested area.

Source: Food and Agriculture Organization Corporate Statistical Database (FAOSTAT).
5. While disaggregated agriculture production data is unavailable for many SADC Member States, most farmers in the SADC region tend to be smallholder subsistence farmers, but medium-scale farms seem to be emerging. There is no singular indicator collected on national farm size distribution across all SADC Member States. Experience and anecdotal evidence hold that farm holdings per household “rarely exceed 1–5 ha” (Muimba-Kankolongo, 2018) or that “most farmers cultivate less than 5 ha” (SADC, 2019a). This seems to be corroborated by the few data points that are available, listed in Table 5 (non-exhaustive). Research for different African countries, including for Tanzania and Zambia, seems to indicate ongoing changes in land ownership patterns and greater emergence of medium-scale farms sized 5–100 ha—in Tanzania and Zambia, these control 39 percent and 50 percent of total farmland, respectively (Jayne et al., 2016).

Table 4: Main crops in the SADC region, share of total production quantity, average 2014–2018 (in %)\textsuperscript{a}

<table>
<thead>
<tr>
<th></th>
<th>Cassava</th>
<th>Maize</th>
<th>Sugar cane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>42%</td>
<td>11%</td>
<td>3%</td>
</tr>
<tr>
<td>Botswana</td>
<td>NA</td>
<td>6%</td>
<td>NA</td>
</tr>
<tr>
<td>The Comoros</td>
<td>21%</td>
<td>2%</td>
<td>NA</td>
</tr>
<tr>
<td>DRC</td>
<td>67%</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>Eswatini</td>
<td>NA</td>
<td>2%</td>
<td>94%</td>
</tr>
<tr>
<td>Lesotho</td>
<td>NA</td>
<td>31%</td>
<td>NA</td>
</tr>
<tr>
<td>Madagascar</td>
<td>20%</td>
<td>2%</td>
<td>22%</td>
</tr>
<tr>
<td>Malawi</td>
<td>22%</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>Mauritius</td>
<td>0%</td>
<td>0%</td>
<td>97%</td>
</tr>
<tr>
<td>Mozambique</td>
<td>50%</td>
<td>8%</td>
<td>18%</td>
</tr>
<tr>
<td>Namibia</td>
<td>NA</td>
<td>9%</td>
<td>NA</td>
</tr>
<tr>
<td>Seychelles</td>
<td>3%</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>South Africa</td>
<td>NA</td>
<td>27%</td>
<td>37%</td>
</tr>
<tr>
<td>Tanzania</td>
<td>13%</td>
<td>15%</td>
<td>7%</td>
</tr>
<tr>
<td>Zambia</td>
<td>10%</td>
<td>29%</td>
<td>42%</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>4%</td>
<td>12%</td>
<td>62%</td>
</tr>
<tr>
<td>Regional</td>
<td>27%</td>
<td>13%</td>
<td>21%</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Crops were selected as the three crops with greatest share of total regional production.

Source: Food and Agriculture Organization Corporate Statistical Database (FAOSTAT)
Table 5: Available average farm size data for SADC Member States

<table>
<thead>
<tr>
<th></th>
<th>Year</th>
<th>Average farm size (ha)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botswana</td>
<td>2004</td>
<td>1.9</td>
<td>Headey and Jane, 2014</td>
</tr>
<tr>
<td>Madagascar</td>
<td>2005</td>
<td>0.9</td>
<td>Headey and Jane, 2014</td>
</tr>
<tr>
<td>Malawi</td>
<td>2009</td>
<td>1.4</td>
<td>Headey and Jane, 2014</td>
</tr>
<tr>
<td>Tanzania</td>
<td>2013</td>
<td>1.9</td>
<td>FAO, 2014</td>
</tr>
<tr>
<td>Zambia</td>
<td>2008</td>
<td>3.7</td>
<td>Headey and Jane, 2014</td>
</tr>
</tbody>
</table>

Source: Various, as indicated.

6. **Maize is by far the most-traded agricultural commodity in the region and the SADC region is typically self-sufficient in maize production, balancing production shortfalls across countries.** The total quantity of maize produced in the SADC region typically meets or exceeds requirements by all SADC Member States for food and industrial use. South Africa is the key maize exporter in the region, with established trading routes to all its neighbors. Other key exporters include Malawi, Tanzania and Zambia. Conversely, Mozambique and Zimbabwe have a structural maize deficit and are importers (FEWS NET, 2019). Intra-regional trade thus plays an important role in buffering domestic production shocks (Davids et al., 2016).

7. **Meanwhile, overall intra-SADC trade, including agricultural trade, remains relatively weak, showing however great untapped potential.** Even after lifting tariffs on 85 percent of traded goods within 13 SADC Member States, total intra-regional trade is only at about 10 percent of total trade volume—much lower than within ASEAN (25 percent) or the EU (40 percent). Intra-regional trade is dominated by South Africa, around one quarter of whose total export volume goes to other countries in SADC (OECD, 2017). From 2013 to 2017, exports and imports from South Africa accounted for 58 and 18 percent of all intra-SADC exports and imports, respectively (Chidede and Sandrey, 2018). Intra-regional trade generally suffers from the many non-tariff measures (NTM) in place. Agricultural trade is particularly affected by the high number of sanitary and photo-sanitary (SPS) restrictions, the most common NTM in the region. For example, fruits in the SADC region are subject to over 400 measures, meat to over 250 measures, and dairy products to over 200 measures (Vanzetti et al., 2016). Other NTMs in the SADC region include complex customs procedures; the multiple membership of countries in different free-trade areas, which complicates the establishment of the right preferential tariff rate; the fact that border posts are not operated permanently; the incompatibility of customs systems between countries; high incidence of customs corruption; and a complex rules of origin regime. In addition, tariffs often focus primarily on generating revenue rather than on facilitating trade—national tariffs have even been raised on products produced in the region, violating national trade liberalization commitments. Finally, infrastructure is often weak and there are barriers to competition (OECD, 2017, citing other sources).
1.2 Regional structural vulnerability

8. With significant poverty levels, the SADC region is facing high vulnerability at the household level, particularly in rural areas. Across the region, approximately half of the population lives on less than US$1 per day (SADC, 2019a). According to the World Development Indicators, 54 percent of the population in SADC Member States live on less than US$1.90 per day. This number can be expected to be much higher for farmers in rural areas.

9. Agriculture, largely rain-fed and with limited commercialization, is particularly vulnerable. Across the region, only about 7 percent of cultivated land is irrigated (SADC, 2019a), making the vast majority of agricultural producers completely dependent on rainfall. Coupled with the fact that most farms are small and farmers often poor, working on a self-subsistence basis, agriculture is a particularly vulnerable sector to external shocks.

10. On a macroeconomic level, the SADC region faces significant challenges, including increasing debt, falling foreign exchange reserves, high inflation, and the slowing growth of the South African economy. Even before the arrival of the COVID-19 crisis, economic growth prospects in the SADC region were lower than in other parts of the African continent, largely due to a slowing economy in South Africa. In 2018, the South African economy, contributing two thirds of regional GDP, only grew by 1 percent. Unemployment in South Africa has steadily risen over the last ten years, reaching 28 percent in 2019. Beyond South Africa, some countries are subject to particularly difficult dynamics, with eastern DRC and northern Mozambique weakened by conflicts, and Zimbabwe facing a particularly volatile macroeconomic situation, with increases in food and fuel prices, and foreign exchange shortages. Across the SADC region, average total debt service as a percentage of Gross National Income (GNI) has risen from 2.8 percent in 2011 to 4.2 percent in 2018. Average total reserves as a percentage of total external debt have fallen from 79 percent in 2010 to 65 percent in 2018. Inflation is persistently high in some countries, averaging 17 percent in Angola between 2010 and 2018, 17 percent in Malawi, 9 percent in Zambia, and hyperinflation in Zimbabwe (World Development Indicators; SADC, 2019a).

11. COVID-19 adds to the difficult economic dynamic in 2020, with the exact consequences so far unclear. As countries worldwide have imposed countermeasures to curb the spread of the pandemic, economies suffer. In 2020, the International Monetary Fund expects real GDP to shrink in 12 of the 16 SADC Member States. Real GDP of the SADC region overall is expected to shrink by about 3.9 percent in 2020 (IMF, 2020). Some sectors will be particularly affected, namely commodities, tourism, and trade sectors: (i) SADC Member States export a range of commodity products, including, for example, iron ore, aluminum, chrome, manganese, copper, gold, platinum, diamonds, and oil. Dropping global demand for many commodities will impact different SADC Member States negatively. Less diversified economies like Angola, Botswana and Zimbabwe will be particularly affected; (ii) the SADC region is a major tourist destination and countries such as Mauritius, Seychelles, South Africa, Zambia, and Zimbabwe are already suffering from the COVID-19 countermeasures; (iii) Southern Africa’s main trading partners are the EU and China—as growth turns negative there, demand for Southern African products will slow, too. SADC is the most industrialized African region and will thus
be disproportionately affected by the closure of factories worldwide and the disruption of supply chains (UNECA, 2020).

12. **Of all sectors affected by COVID-19, agriculture deserves special attention.** Many farmers in the SADC region are subsistence farmers, thus in some ways possibly isolated from impacts of the shock. However, the sector must receive special attention during COVID-19 given its sheer size and its overall degree of vulnerability. Many farmers are among the poorest. They are exposed to climatic shocks, often lack reserves, may not be able to care for their farms, and may face rising food prices and restricted access to markets.

1.3 **Economic and financial impacts of agricultural shocks**

13. **Countries in the SADC region are exposed to a great variety of agriculture-related shocks, including from weather events, commodity price volatility, and pests and diseases for crops and livestock.** Among weather shocks, drought is most important and pervasive in the SADC region, but other recent events such as tropical cyclones hitting Mozambique and Zimbabwe in 2018, and recurrent floods in many places serve as painful reminders of the region’s exposure. The El Niño-Southern Oscillation (ENSO) is a persistent periodic, even if irregular, threat. Food price volatility affects both producers and consumers and can be a significant driver of food insecurity. Pests such as locusts and diseases such as Foot-and-mouth disease pose a problem for both cereal and livestock producers. New pests and diseases are spreading such as the fall armyworm (FAW). All these shocks affect agricultural producers, have a negative impact on food security, and are expected to worsen in the coming years due to climate change.

14. **The economic and financial costs of these shocks, while often difficult to quantify, are extremely high.** The EM-DAT database estimates that natural hazards have caused total damages of US$10.3 billion in the SADC region from 2000 until 2019, with US$2.2 billion caused by droughts, US$2.4 billion by floods, and US$3.9 billion by storms (Table 6). Including indirect losses, the long-term economic costs are likely to have been much higher.

<table>
<thead>
<tr>
<th>Disaster</th>
<th>Total damages in SADC Member States 2000–2019 (US$) a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Droughts</td>
<td>2.2 billion</td>
</tr>
<tr>
<td>Floods</td>
<td>2.4 billion</td>
</tr>
<tr>
<td>Storms</td>
<td>3.9 billion</td>
</tr>
<tr>
<td>Other a</td>
<td>1.7 billion</td>
</tr>
<tr>
<td>Total</td>
<td>10.3 billion</td>
</tr>
</tbody>
</table>

* Ash fall, cold wave, forest fire, ground movement, heat wave, land fire, landslide, tsunami.

Source: Centre for Research on the Epidemiology of Disasters—CRED (EM DAT database).

15. **The high costs of agricultural shocks are also reflected in the fact that humanitarian donors are providing an annual average of 0.5 percent of regional GDP to the region.** From 2000 until 2019, humanitarian donors have provided an annual average of US$882 million in humanitarian aid to lower- and lower-middle-income countries in the SADC region, equivalent of 0.5 percent of GDP of the recipient countries. Actual humanitarian costs are likely
to have been even higher, given that this figure does not include government allocations, and that on average only 57 percent of country level humanitarian appeals in the SADC region period were covered. It is noteworthy that total humanitarian funds committed to the region, while having risen substantially over time (even accounting for inflation, humanitarian funding to the region increased threefold from 2000 until 2019), their share of recipient countries’ GDP display a negative trend. This is largely due to GDP growth in the region (Figure 2).

Figure 2: Humanitarian flows to SADC region and average funding coverage of country-level humanitarian appeals, 2000–2019

1.3.1 Weather risk

16. Weather events regularly affect a large population in the SADC region, with drought being the most important hazard. The SADC region is frequently subject to extreme droughts and floods, as well as other extreme events such as tropical storms. In total, the FAO estimates that from 2005 to 2015, the Southern Africa region lost 8 percent of its crop and livestock production to weather events (FAO, 2018c). Of all weather events, droughts affect by far the most people in the region, over 80 million people since 2000 (Figure 3). This is often fueled by ENSO and thus spikes correlate with the occurrence of the El Niño event e.g., in 2004/05 and 2015/16. Some countries are affected much worse than others: in Eswatini, Lesotho, Malawi, and Zimbabwe, over 5 percent of the national population were affected by drought per year since 1995, on average (Figure 4). In drought years, this percentage can exceed 50 percent in some countries (e.g., in Zimbabwe in 2001 and 2019).

Figure 3: Number of people affected by natural hazards in SADC Member States by year, 1995–2019

Figure 4: Average annual percentage of national population affected by drought, 1995–2019
17. **Southern Africa is one of the most exposed and vulnerable areas to drought worldwide.** Given high dependency on water, agriculture is often the sector most heavily affected by droughts (Dilley et al., 2005; UNDRR, 2019). Across the SADC region, droughts often cause catastrophic impact given the combination of (i) agriculture being the most important economic sector in many countries; (ii) the high shares of rural population (as a percentage of total population in the region); (iii) the small share of cultivated land under irrigation; and (iv) the prevalence of high poverty and chronic food insecurity across the region. A recent global analysis of spatial and vulnerability data of drought risk placed four SADC Member States (Zimbabwe, Namibia, Botswana, and Lesotho) among the ten countries with the highest risk of drought worldwide for combined agricultural systems (rainfed and irrigated) (Meza et al., 2020).

18. **Drought is the key driver of food insecurity in the region.** Between 2005 and 2013, some 15 million people in the SADC region were food insecure per year (SADC, 2014b). Since then, the region has faced a series of especially dry years, which led to many areas experiencing poor harvests almost every year (Figure 5). In 2019, 30 million people were considered to be in “crisis” or worse per the Integrated Food Security Phase Classification (IPC) (FSIN, 2020). The situation for 2020 will possibly be worse, with an estimated 13.8 million people (excluding Mauritius and South Africa) food insecure at the peak of the lean season from January to March—20 percent more than in 2019 (Figure 6; FAO, 2020a; see also Box 1). The 2020 Global Report on Food Crises lists 10 SADC Member States to be among the currently most pertinent food crises in the world and identifies in nine of them drought as “acute food insecurity and malnutrition driver” (FSIN, 2020).

---

3 These countries are Angola, Eswatini, Lesotho, Madagascar, Malawi, Mozambique, Tanzania, Zambia, Zimbabwe. The Democratic Republic of Congo is listed among the most pertinent global food crises but drought is not a key driver.
Following droughts, floods and cyclones tend to affect the most people in the region. Since 1995, the EM-DAT database counts 313 flood events in SADC Member States. Since 2000, floods have affected around 15 million people (EM-DAT database). Likewise, cyclones are a frequent phenomenon: EM-DAT counts 72 occurrences of tropical cyclones since 1995, 40 of which were registered in Madagascar. Countries exposed to tropical cyclones include The Comoros, Malawi, Madagascar, Mozambique, Tanzania, and Zimbabwe. Most of the cyclones have low to moderate impact but 2019 proved to be a particularly devastating year. Tropical cyclones Idai and Kenneth, the latter being the strongest cyclone ever to hit the continent, wreaked havoc in The Comoros, Malawi, Mozambique, and Zimbabwe. Together, both storms caused recovery needs of more than US$3 billion in Mozambique alone (GoM and UNDP, 2019; see Box 1). The two storms exemplified that the occurrence of cyclones is typically linked with floods, leading to 3.8 million people being affected by flood in the four countries. The storms hit during the harvest and Idai alone destroyed almost 780,000 ha of standing crops in Malawi, Mozambique, and Zimbabwe (SADC, 2019a).

Box 1: Hunger crisis in Southern Africa 2015–2020

Over the last five years, the Southern Africa region has been hit by a series of compounding weather shocks with devastating impact on agricultural production. They have triggered one of the most severe hunger crises in the world today.

2015–2016: After a poor harvest for the 2014/15 agricultural season, the region was subject to the ENSO phenomenon in 2015/16, engendering the worst drought in 35 years. The drought affected 40 million people, led to massive regional cereal shortfalls and created a significant rise in the price of staple foods. In July 2016, SADC declared a regional emergency and launched a humanitarian appeal for 13 countries, for US$2.4 billion. This was supported by an Action Plan by the Regional Inter-
Agency Standing Committee (RIASCO) requesting US$1.3 billion in humanitarian assistance, of which US$900 million was received (FAO, 2018b).

2016–2018: The 2016/17 agricultural season was mainly favorable for the region, boosting the domestic availability of cereals, resulting in lower food prices and thus lowering overall food insecurity (FSIN, 2018). In 2017/18, food insecurity dropped to about 30 million people in SADC Member States. The 2017/18 agricultural season was again characterized by dry spells, leading to cereal harvest contractions in many countries, especially in Lesotho, Zambia and Botswana (SADC, 2018).

2018–2019: The 2018/19 agricultural season saw a mix of drought and cyclones, leading to flooding in the region. The region’s 2019 maize harvest was 10 percent lower than the average. Most affected by drought were Botswana (-98 percent compared to 5-year average), Lesotho (-61 percent), Zambia (-34 percent), Zimbabwe (-32 percent), Angola (-30 percent) and Namibia (-25 percent) (FEWSNET, 2019). In 2019 Angola, Botswana, Namibia and Zimbabwe declared states of emergency due to drought. In addition, Mozambique, The Comoros, Madagascar, Tanzania and Zimbabwe were hit by cyclones Kenneth and Idai which resulted in more than US$2 billion in damages across the five countries and more than US$3.2 billion in needed recovery support (GoM and UNDP, 2019). The cyclones also had major impacts on economic activity, as ports were disrupted, and on macroeconomic indicators such as inflation and fiscal balances (IMF, 2019). The crisis also affected the demand and supply of seasonal workers—OCHA estimates that even in a best-case scenario of good rainfall, it might take small farms two to three seasons to return to normal production (OCHA, 2019). Forty-one million people were expected to be food insecure as a result of these shocks (SADC, 2019a).

2019–2020: The 2019/20 season started again with prolonged periods of below-average rainfall from October to December 2019, with some parts of the region experiencing the lowest levels of rainfall since 1981 (FAO, UNICEF, WFP, 2019). This was followed by strong rains in January-February 2020, causing localized flooding in some areas but mainly relaxing the stressed crop situation. Production prospects particularly improved for South Africa, where the harvest is expected to be better than for the 2018/19 season. However, given the poor start, some countries, namely Botswana, Namibia, Zimbabwe and the Southern parts of Mozambique and Madagascar are expected to register another below-average harvest (FAO, 2020a). COVID-19 is expected to further compound negative economic effects.

**Food insecure population in SADC Member States**

![Graph showing the number of food insecure population in SADC Member States from 2015/16 to 2019/20](image)

Source: SADC, 2019a.

20. **Climate change is expected to increase the frequency and severity of natural hazards in the region, a trend already observed in recent years.** Temperatures are expected to rise across the SADC region, especially in South Africa and parts of Namibia and Botswana, and total precipitation to decrease by 10–20 percent (IPCC, 2018). With rising temperatures,
scientists also predict a tendency for late-onset and variable rainfall across the region. This will lead to periodic spikes in food insecurity (IFPRI, 2013). These changes could already be observed over the last two decades—temperatures in the Southern Africa region seem to be rising at about twice the global average (OCHA, 2019; Figures 5 and 7). In sub-Saharan Africa, climate change will reduce agricultural productivity, could lead to agricultural losses of 2–7 percent of GDP, and could reduce the production of staple foods by up to 50 percent (IPCC, 2007). For Tanzania, a 2011 study estimated that the expected temperature increase of 2°C by 2050 will reduce production of maize by 13 percent, of sorghum by 8.8 percent and of rice by 7.6 percent (Rowhani et al., 2011).

Figure 7: Observed temperature change over cropping areas, 2015–2016 vs. historical (15 years)

FAO, 2018a.

1.3.2 Agricultural commodity and food price risk

21. **Food price volatility poses severe risks for consumers and producers, and generally for the macroeconomy.** At the consumer level, higher food prices are catastrophic for the poor, as they are forced into food insecurity and longer-lasting detrimental changes in their diet. Women and children tend to be exponentially affected. At the producer level, high food prices can be a good thing, raising revenues and incentivizing more production. However, the uncertainty is problematic—if food prices drop while producers are locked into strategies dependent on higher price levels to be viable, they may lose productive investments. In contexts where volatility is high, financing may thus be prohibitively expensive, as agriculture is seen by lenders as a risky business. Given high price volatility, producers may be deterred from engaging in cultivating a given crop in the first place or in commercializing that crop. At the macroeconomic level, uncertainty also creates many challenges. Countries exporting agricultural commodities facing price volatility will be subject to fluctuations in their balance of payments, receive less investment, and experience lower economic growth. Countries importing agricultural commodities faced with high prices will also experience a worsened balance of payments but can also experience inflation and exchange rate depreciation (FAO et al., 2011).

22. **It is important to differentiate between inter-annual and intra-annual price volatility.** Inter-annual volatility is a measure of price dispersion across years. For producers, it is
an important measure to decide on large, long-term investments, e.g., equipment or machinery. Intra-annual volatility is a measure of price dispersion within a given year. For producers, it matters because they can typically substitute different grains with relative ease at the beginning of the season, especially between cereals. However, the higher intra-annual volatility, the more difficult the planting decision becomes (Ott, 2014). It is also important because many rural producers in the region sell their produce immediately after the harvest, as they face both liquidity constraints and lack of storage opportunities. With high intra-annual volatility, they are often forced to sell at low prices and re-buy later during the year at higher prices (Burke et al., 2017; Stephens and Barrett, 2012).

23. **The inter-annual price volatility for maize, the most important and most traded food crop in the region, is high in the SADC region.** Maize prices in Southern Africa are characterized by high year-on-year volatility (Figure 8). The impacts of the food price crisis of 2008/09 and of the 2015/16 ENSO phenomenon can clearly be identified, but variation is significant also otherwise.
24. **Intra-annual food price volatility is likewise high in SADC Member States.** Maize markets in the SADC region are among the most volatile in the world (Kornher, 2014). Maize price volatility as calculated from the standard deviation of intra-annual food prices in capital cities in the region often exceeds 10 or 15 percent (Figure 9). Meanwhile, the underlying average seasonal price gap for maize—i.e., the average difference between the maximum and the minimum maize price within one calendar year—is higher, amounting to 38 percent in Malawi, and 44 percent in Mozambique (Figure 10). Some studies have identified even greater seasonal price gaps of more than 50 percent in some countries (Gilbert et al., 2017). It tends to be lower in countries with two agricultural seasons such as Tanzania, where the seasonal price gap is only 11 percent (Kornher, 2018).

25. **Much of inter-annual price variability in the SADC region can be explained with weather shocks leading to varying production levels.** It should be noted that the inter-annual...
volatility of agricultural prices generally tends to be high, not just in the SADC region but in any context. This is due to three major market fundamentals. First, agricultural yield volumes vary from season to season due to changing weather conditions. In the SADC region, these are reflected in varying production levels. For example, average per capita maize production variability in the period 2000–2014 was 23 percent for Malawi, 19 percent for Mozambique, 23 percent for Tanzania, 36 percent for Zambia and 25 percent for Zimbabwe (Kornher, 2018). In many ways, inter-annual food price volatility is thus a second-order effect where weather shocks determine production levels determining variation. Second, demand elasticity is low in the short run, thus even small changes in supply can create large price changes. Third, agricultural production takes time and thus is slow to adapt to external price changes in the short term (i.e., should a non-production-related shock lead to price variation, producers will likely only adapt after completion of the production cycle) (FAO et al., 2011; Gilbert and Morgan, 2010).

26. Intra-annual price volatility largely depends on structural factors, including farmers’ liquidity constraints and limited storage possibilities. Many farmers face liquidity constraints and thus sell their produce immediately after the harvest. There also tends to be a lack of storage opportunity which likewise increases pressure on farmers to sell. Thus, at an aggregate level, prices tend to drop right after the harvest and rise again toward the end of the lean season.

27. Developing country markets often lack the capacity to absorb domestic shocks and can be subject to high domestic price volatility even during periods of calm international markets. A reason for this effect is the compounding of climate shocks, pests or other natural calamities, exacerbated by the fact that farmers may have poor access to technologies and generally poor management of soil and water. Poor infrastructure, high transport costs, absence of credit or insurance markets and various policy and governance failures may compound the initial difficulty.

28. SADC Member States have employed different strategies to stabilize food price volatility in the past, but these have often been ineffective. These strategies include the following:

- Intra-regional trade: Trade is the most important buffer instrument for sudden price shocks and is employed widely across the SADC region. However, the potential for lowering price spikes through intra-regional trade is often limited because cereal production cycles (e.g., of maize), are largely aligned across the region (Kornher, 2018).
- Countercyclical trade policies: To stabilize food price surges, some many countries resort to short-term tariff instruments. Exporting countries levy export restrictions, while importing countries apply import subsidies to encourage a greater flow of food items. Indeed, many countries in the SADC region have applied such instruments in the past, mostly in an ad hoc manner. Economic theory holds that such measures have overall negative effects both within and outside the applying country—domestically, overall welfare gains of consumers do not outweigh the welfare losses of producers;

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internationally, they exacerbate price fluctuations. Tariff-based interventions to stabilize food prices have thus been heavily criticized following the international food price crisis in 2007–2008. Their impacts in the SADC region seem to have been limited, however: different research studies on the impact of export bans for maize in the region have found little or no impact on domestic food prices (Sitko et al., 2014; Porteous, 2017).

- **Market operations and buffer stocks:** Using marketing boards and buffer stocks, various SADC Member States actively engage in grain procurement and release with the goal of stabilizing food prices, including particularly Malawi, Zambia, and Zimbabwe. International consensus holds, however, that buffer mechanisms tend to be more successful in preventing price drops rather than spikes. The key reason for this is that during a price surge, the buffer stock’s possibilities are limited to releasing to the market what it has previously bought, which may not be sufficient. Stabilizing world prices can be extremely costly. Government market interventions can also bear the opposite of the intended effect—when interventions happen in a sudden, ad hoc manner, this creates uncertainty which in turn discourages lending to private traders, reduces their activity, and ultimately raises price volatility. Finally, buffer stocks can also become the target of food price speculators. If the market correctly assumes that stocks held by the buffer stock are too low to maintain a set price level, speculators can try to corner the market by buying large volumes of food and thus raise the price level (World Bank, 2012; FAO et al., 2011; Gilbert, 2011; Wright and Prakash, 2011). Reviews of the experience of individual SADC Member States (e.g., of Malawi and Zambia), generally confirm international experience and show that government involvement in maize procurement and release has not contributed to greater price stability (World Bank, 2012). Indeed, despite large stabilization programs, price volatility in Malawi, Zambia, and Zimbabwe is higher than in the other countries in the region that mainly rely on trade for price stabilization (Minot, 2014).

- **Price hedging and commodity exchanges:** In many middle- and upper-income countries and international markets, agricultural commodity price volatility is managed through risk management strategies that include hedging. Hedging (through forwards or derivative contracts) allows to transfer the risk of the price changing to the other party. Hedging opportunities exist through financial institutions’ customized transactions (over the counter/OTC) or through commodity exchanges. Commodity exchanges link buyers and sellers for these price hedging contracts (forwards and/or derivatives). In the SADC region, commodity exchanges have largely been unsuccessful, except for the South African Futures Exchange (SAFEX). Other, much smaller, commodity exchanges exist with ACE in Malawi and ZAMACE in Zambia, although trading on the latter was suspended between 2012 and 2018 due to low trading volumes and conflicts of interest (Baulch, 2018). The reason for the apparent lack of development of commodity exchanges is that for agricultural commodity markets to function well and as intended in terms of hedging and price discovery, appropriate governance of the commodity exchange and legal/regulatory frameworks need to be in place. In particular, greater public

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5 This seems e.g., to have been the case in Malawi (Dana et al., 2007).
6 There is some disagreement in the literature, however, with some finding some stabilization effect of these policies also for the SADC region—e.g., Kornher (2018) cites some evidence.
sector support toward transparency of agriculture commodity transactions (i.e., providing incentives for supply chain actors to register their trades to measure volumes and prices) is needed, as well as for financial institutions across OTC markets, where transactions take place off the regulated commodity exchanges.

29. Other food and agriculture price risk management approach hold greater promise, including the monitoring of food stocks or warehouse receipt systems.

- **Food stock and market monitors**: Information on the current situation and outlook for global agriculture shapes expectations about future prices and allows markets to function more efficiently. Analysis of global and local markets and transparency about available food stocks can reduce the incidence and magnitude of panic-driven price surges. In the SADC region, this function has largely been taken on by a system developed by WFP and FEWS NET that monitors maize markets and informal cross-border food trade and publishes relevant bulletins on a regular basis.

- **Warehouse Receipt Systems (WRS)**: WRS involve a certified storage facility (warehouse) offering smallholder farmers to store their farm produce from the harvest to the lean season. To overcome liquidity constraints farmers can acquire a warehouse receipt from the warehouse which the holder can use as collateral for a credit at a local financial institution, or to sell it for cash to a buyer. The operator of the warehouse who is in the possession of the stocks guarantees the delivery of the stored commodity against the receipt. This guarantee includes possible theft, deterioration, and damage due to fire and other catastrophes during the storage period. The key benefit of this approach is that liquidity-constrained farmers can store some of their produce after the harvest to sell it later during the year at higher prices, transferring the risk of storage through the WRS and using the de-risking instrument to leverage financing. If done at an aggregate level, this can help lower intra-annual price volatility (Coulter and Onumah, 2002). WRS are being implemented in various countries across the SADC region, with technical support from various partners such as IFAD and the World Bank.

1.3.3 Risks from pests and diseases to crops and livestock

30. Crop and livestock producers in the SADC region face large losses every year due to pests and diseases. A vast array of different pests and pathogens affect agricultural production in Southern Africa. Information is scarce on crops, and quantification of economic impact is difficult given the diversity of pests and diseases, cultivated crops, agricultural settings in the biosphere, and methodological challenges. For sub-Saharan Africa, a recent study estimated that around 30 percent of all maize, 30 percent of all wheat and 25 percent of all rice production is lost to pests and diseases (Savary et al., 2019). On livestock, some more data is available given reporting by the World Organization for Animal Health (OIE), which requires its 182 member states—including all SADC Member States—to notify the occurrence of a range of animal diseases. However, data issues persist and quantification of economic impact is difficult given similar complexities as with crops (FAO, 2016). No comprehensive estimates of disease-

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7 For example, no OIE data are available for Madagascar and the Seychelles.
related livestock losses for Southern Africa are available; a few specific exemplary loss estimates for different diseases in Africa are shown in Table 7.

Table 7: Selected loss estimates for different livestock diseases in Africa

<table>
<thead>
<tr>
<th>Disease</th>
<th>Region</th>
<th>Estimated impact</th>
<th>Scope</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot and Mouth Disease (FMD)</td>
<td>Africa</td>
<td>US$1 — 5 billion</td>
<td>Annual losses from FMD</td>
<td>Knight-Jones and Rushton, 2013</td>
</tr>
<tr>
<td>Contagious bovine Pleuropneumonia (CBPP)</td>
<td>Africa</td>
<td>EUR 44.8 million</td>
<td>Annual cost in Africa</td>
<td>Tambi et al., 2006</td>
</tr>
<tr>
<td>Contagious bovine Pleuropneumonia (CBPP)</td>
<td>Africa</td>
<td>US$2 billion</td>
<td>Annual losses to African farmers</td>
<td>Otte et al., 2004</td>
</tr>
</tbody>
</table>

Source: As indicated.

31. **For crop farmers in the SADC region, the most urgent threat is the fall armyworm.** The fall armyworm (FAW) is a pest native to the tropical and subtropical regions of the Americas that damages and destroys a wide variety of crops. It was first detected in the SADC region during the 2016/17 agricultural season. Its presence has now been confirmed in all countries except for Lesotho. The FAO has identified nine SADC Member States to be at “high” and three at “moderate” risk of another outbreak in 2020 (FAO, 2020b). Loss estimates are large but differ: some estimate that FAW could cost the African continent around US$3 billion annually (FAO, 2017). One 2017 study estimated total current and projected economic losses of maize, sorghum, rice and sugar cane in Africa due to FAW to amount to US$13.4 billion, not taking into account 80 other crops that the insect is known to feed on, as well as seed lost for subsequent seasons (Abrahams et al., 2017). Fighting the pest is expensive—in Brazil, where FAW is endemic, annual control costs have been estimated at US$600 million per year (FAO, 2018b).

32. **Other important crop pests for the region include African armyworm, tomato Leafminer, fruit flies and locusts.** They have large destructive potential in the SADC region (FAO, 2014). Red locusts are a recurrent threat in many countries in the sub-region and the FAO places five countries at risk of a red locust invasion in 2020. Migratory locusts are a challenge, too—Madagascar faced a migratory locust invasion 2012–2016 which affected 13 million people (60 percent of the population), 9 million of whom relied on agriculture for their livelihoods (FAO, 2015). Some fear the emergence of the Southern armyworm, which has been reported in some West African countries (SADC, 2018).

33. **Crops in the SADC region are also exposed to a variety of diseases, including emerging ones.** Major crop diseases in the SADC region include cassava virus disease, wheat rust, banana bunchy top virus, maize lethal necrosis disease and Panama disease tropical race 4 (TR4) (FAO, 2018). Key emerging diseases include cassava brown streak disease, especially in Tanzania and Zambia (FAO, 2020b), and the Asian citrus greening disease (SADC, 2018).
Table 8 gives an overview of the latest threats as assessed by the FAO from pests and diseases for crops in SADC Member States.

**Table 8: Potential (moderate to high likelihood) food chain threats in SADC Member States forecasted for January to March 2020**

<table>
<thead>
<tr>
<th>Plant pests and diseases</th>
<th>Forest pests and diseases</th>
<th>Locusts</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Fall armyworm (FAW)</td>
<td>- Blue-gum chalcid</td>
<td>- Migratory Locust</td>
</tr>
<tr>
<td>- Cassava mosaic disease (CMD)</td>
<td>- Red gum lerp psyllid</td>
<td>- Red Locust</td>
</tr>
<tr>
<td>- Cassava brown streak disease</td>
<td>- Polyphagous (PSHB)</td>
<td></td>
</tr>
<tr>
<td>- Banana fusarium wilt disease</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Adapted from FAO, 2020b.*

34. The most important livestock diseases in SADC Member States include Foot-and-mouth disease, Rift Valley Fever, Newcastle Disease, Peste des Petits Ruminants, African Swine Fever, Contagious Bovine Pleuropneumonia, and Anthrax (FAO, 2020b; OIE WA-HIS):

- **Foot-and-mouth disease (FMD)** is a frequent, if varying, occurrence across the region for livestock such as cattle (Figure 11). It is highly contagious and can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade. Recently, it re-emerged as serotype O in Zambia in August 2018 and could possibly spread across the region from there as many animals are not vaccinated against this strain of the virus. The FAO considers FMD endemic in Tanzania.

- **Rift Valley Fever (RVF)** can cause mortality and abortion of infected animals such as cattle and can be transmitted to humans. It is transmitted by mosquitoes and thus occurrence is highly correlated with rainfall and floods. The FAO considers it endemic in DRC and Mozambique.

- **Newcastle Disease** is a highly contagious viral avian disease that is often fatal. It is transmitted by direct contact with infected birds or their feces. Newcastle disease is endemic in many countries around the world and also occurs frequently in all SADC Member States. Namibia is the only SADC country with a significant number of years without reported occurrence (Table 9).

- **Peste des Petits Ruminants (PPR)** is a highly contagious virus disease affecting sheep and goats. It can infect up to 90 percent of an animal herd and kills 30–70 percent of infected animals. It is considered one of the most damaging livestock diseases in Africa. It is considered endemic in DRC and Tanzania. It likely to spread through small ruminant movement and pastoralism along border areas and may thus be introduced into neighboring countries such as Malawi, Mozambique and Zambia. Many countries in the region have never reported an occurrence, including Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, and Zimbabwe. Madagascar was declared free from the disease in 2018.
• **African Swine Flu** is a typically deadly viral disease that affects pigs and wild boar. Neither vaccines nor cures exist. It is endemic in many countries across sub-Saharan Africa, including many in the SADC region such as Angola, DRC, Madagascar, Malawi, Mozambique, Namibia, Tanzania, and Zambia\(^8\). It is usually transmitted via contact with other contaminated animals or contaminated items such as food or equipment.

• **Contagious Bovine Pleuropneumonia (CBPP)** is a bacterial disease that affects the lungs of cattle and other livestock. It causes mortality, loss of milk production and drastic weight loss in chronic cases. In the SADC region, it is endemic in Angola, DRC, Namibia, Tanzania, and Zambia\(^9\).

• **Anthrax** is a bacterial disease most common in cattle, goats, sheep, and antelopes. It is frequently fatal. It can be transmitted to humans. It is endemic in most sub-Saharan African countries. In the SADC region, this includes Angola, Lesotho, Tanzania, Zambia, and Zimbabwe\(^10\).

Table 9: Number of years with reported occurrence of most important livestock diseases among domestic animals 2010–2019

<table>
<thead>
<tr>
<th>Country</th>
<th>FMD(^a)</th>
<th>RVF(^b)</th>
<th>NCD(^c)</th>
<th>PPR(^d)</th>
<th>ASF(^e)</th>
<th>CBPP(^f)</th>
<th>Atx(^g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>2</td>
<td>0</td>
<td>En*</td>
<td>0</td>
<td>En*</td>
<td>En*</td>
<td>En*</td>
</tr>
<tr>
<td>Botswana</td>
<td>8</td>
<td>2</td>
<td>En*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>The Comoros</td>
<td>1</td>
<td>0</td>
<td>En*</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DRC</td>
<td>4</td>
<td>En*</td>
<td>En*</td>
<td>En*</td>
<td>En*</td>
<td>En*</td>
<td>5</td>
</tr>
<tr>
<td>Eswatini</td>
<td>0</td>
<td>0</td>
<td>En*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lesotho</td>
<td>0</td>
<td>0</td>
<td>En*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>En*</td>
</tr>
<tr>
<td>Madagascar</td>
<td>0</td>
<td>0</td>
<td>En*</td>
<td>0</td>
<td>En*</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Malawi</td>
<td>5</td>
<td>4</td>
<td>En*</td>
<td>0</td>
<td>En*</td>
<td>0</td>
<td>N.A.</td>
</tr>
<tr>
<td>Mauritius</td>
<td>1</td>
<td>0</td>
<td>En*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mozambique</td>
<td>7</td>
<td>En*</td>
<td>En*</td>
<td>0</td>
<td>En*</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Namibia</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>En*</td>
<td>En*</td>
<td>6</td>
</tr>
<tr>
<td>Seychelles</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>South Africa</td>
<td>10</td>
<td>3</td>
<td>En*</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Tanzania</td>
<td>En*</td>
<td>0</td>
<td>En*</td>
<td>En*</td>
<td>En*</td>
<td>En*</td>
<td>En*</td>
</tr>
<tr>
<td>Zambia</td>
<td>7</td>
<td>0</td>
<td>En*</td>
<td>1</td>
<td>En*</td>
<td>En*</td>
<td>En*</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>9</td>
<td>1</td>
<td>En*</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>En*</td>
</tr>
</tbody>
</table>

\(^a\) Foot and Mouth Disease; \(^b\) Rift Valley Fever; \(^c\) Newcastle Disease; \(^d\) Peste des Petits Ruminants; \(^e\) African Swine Fever; \(^f\) Contagious Bovine Pleuropneumonia; \(^g\) Anthrax.

* Endemic—if OIE WAHIS data indicates occurrence every year or if labeled as “endemic” by FAO.
Source: OIE WAHIS; FAO EMPRES-i Global Animal Disease Information System; FAO, 2020b.

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\(^8\) According to OIE WAHIS data that indicates occurrence every year.
\(^9\) Ibid.
\(^10\) Ibid.
35. **Climate change is expected to exacerbate the spread of pests and diseases.** A warming climate is expected to lead to irregular rainfall patterns and a greater frequency and severity of natural hazards such as droughts, cyclones, and floods. In addition, warming temperatures could also lead to more frequent and intense plant pests and disease outbreaks. For example, this was the case during the desert locust outbreaks in North West Africa and in Yemen in 2015 and 2016 (FAO, 2018a). Scientists also believe that the global spread of the FAW could be linked to warmer temperatures (FAO, 2017). Similarly, climate change is expected to increase the frequency and severity of animal pests and diseases. For example, as droughts reduce the availability of forage and water, livestock are weakened and become more susceptible to diseases. e.g., during the ongoing drought crisis across the SADC region 2019/20, more than 27,700 animals died in Angola alone (OCHA, 2019). Warmer temperatures in combination with more frequent cyclones and floods might also increase the number of mosquitoes, which in turn could increase cases of mosquito-borne livestock diseases, such as Rift Valley Fever (FAO, 2018d).
2. Existing agriculture risk financing initiatives

2.1 Rationale for disaster risk financing in the agriculture space

36. Using disaster risk financing instruments for agriculture can bolster the effectiveness of how the costs of specific risks are funded. Disaster Risk Financing (DRF) is “the system of budgetary and financial mechanisms to credibly pay for a specific risk or risks, arranged before shocks occur” (CDP, 2019). International experience shows that many countries wait until after disaster strikes before obtaining funding for resulting response costs. In agriculture, shocks such as droughts or pests outbreaks are often associated with high costs to fund humanitarian measures. In the event of such a crisis, many countries realize they lack the needed resources at hand to fund the response, therefore relying on costly and unreliable budget mobilization measures and donor support. The fundamental realization at the heart of DRF is that in many contexts there are large benefits to plan and arrange financing for related costs in advance, as risks will likely strike again.\(^{11}\)

37. It should be noted that there are a host of different agricultural risk management instruments and approaches, and risk financing is just one element that needs to be embedded into a comprehensive agriculture risk management framework. Separate elements of an effective agriculture risk management process include:\(^{12}\)

(i) **Risk identification**, such as the development of agriculture and natural hazard risk profiles, i.e., understanding the extent to which certain parts of the sector are exposed to which risks. Risk identification also includes the assessment of contingent liabilities, i.e., the quantification of fiscal exposure linked to the occurrence of certain risks. It is critical to enable appropriate pricing and application of disaster risk financing instruments and is often the first step to establish a more effective financing framework.

(ii) **Risk reduction**, such as irrigation systems, the improvement of storage infrastructure, land-use planning, and conservation agriculture. Climate-Smart Agriculture (CSA) is an approach that combines various risk reduction tools—conservation agriculture, soil and water conservation, and improved livestock management practices—with emission-reducing elements (PARM, 2018). Generally, agricultural risk reduction tools seek to bolster farm-level resilience against risks that the sector is exposed to.

(iii) **Preparedness building**, such as the use of early warning systems, the development of contingency plans, and building the capacity of disaster responders. Preparedness measures are taken to ensure a country’s capacity to respond effectively when a risk is realized.

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\(^{11}\) The World Bank’s Crisis and Disaster Risk Finance team has captured the most important concepts of disaster risk financing in the “Five DRF Fundamentals”: (i) the relevance of data and risk analytics; (ii) the risk layering approach, i.e., the recognition that specific financing instruments are suited to specific risks; (iii) the timeliness of funding; (iv) the rules guiding disbursement; and (v) the benefits of risk diversification. An overview is given by an e-learning course: [https://olc.worldbank.org/content/fundamentals-disaster-risk-finance-0](https://olc.worldbank.org/content/fundamentals-disaster-risk-finance-0).

\(^{12}\) These are the five Pillars of Action of the Global Facility for Disaster Reduction and Recovery (GFDRR).
(iv) **Risk financing**, including the use of ex-ante and ex-post financing mechanisms for shock response. These are the financial sources used to pay for surge costs associated with a risk occurring (e.g., humanitarian relief following a drought).

(v) **Resilient recovery (and reconstruction)**, including an effective ex-ante design of institutional structures to ensure that recovery and reconstruction after the occurrence of a disaster are timely and of high quality.

38. All these elements are critical for an effective agriculture risk management process. No single element alone—including risk financing instruments—can address the risks that the agriculture sector is exposed to. They are also interdependent, as for example the needed amount and timing of response funding (iv) depend on the planned contingency measures (iii). Also, the more risks are reduced (ii), the more affordable risk financing solutions such as insurance (iv) will be. Thus, a comprehensive approach is needed. One example of an agricultural risk management program that addresses multiple of these elements is the World Food Programme’s (WFP) R4 program, which in the SADC region is also active in Malawi, Zambia, and Zimbabwe, and being piloted in Mozambique (WFP, 2020). Table 10 gives an overview of how various instruments map the different elements of agricultural risk management.

### Table 10: Mapping of exemplary agriculture policy measures to risk management framework

<table>
<thead>
<tr>
<th>Exemplary agricultural risk management measures</th>
<th>Risk identification</th>
<th>Risk reduction</th>
<th>Preparedness building</th>
<th>Risk financing</th>
<th>Resilient recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop agricultural risk profile</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Assess contingent liabilities for agriculture sector</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve crop storage infrastructure</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land-use planning</td>
<td></td>
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<tr>
<td>Climate-Smart Agriculture</td>
<td></td>
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<td></td>
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<tr>
<td>Grain buffer stocks (to manage price risk)</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>Warehouse receipt system</td>
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<td></td>
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<tr>
<td>National or regional disaster early warning system</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Develop disaster contingency plans</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Capacity building of shock response stakeholders</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>National disaster fund</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Strategic grain reserve (to counter food insecurity)</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Public borrowing for shock response</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Contingent line of credit for shock response</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Risk transfer instruments incl. insurance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Exemplary agricultural risk management measures

<table>
<thead>
<tr>
<th>Exemplary agricultural risk management measures</th>
<th>Risk identification</th>
<th>Risk reduction</th>
<th>Preparedness building</th>
<th>Risk financing</th>
<th>Resilient recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price hedging (commodity exchanges)</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strengthen financial mechanisms for recovery</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve public capacities for recovery planning</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strengthen central policy frameworks for recovery</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Sources: Authors.

39. **Embedding disaster risk financing into agricultural risk management frameworks carries many potential benefits, with positive spillovers across development priorities:**

- **Protect incomes:** DRF can help to financially buffer weather, pest/disease, or price shocks to farmers, protecting incomes and strengthening food security.
- **Crowd in investment:** Ensuring farmers are financially protected and can, for example, service potential credit agreements, provides a more predictable and enabling environment for public and private sector investments, fueling development and growth of the sector, as well as job creation.
- **Reduce fiscal burden:** Tempering reliance on post-shock humanitarian relief reduces government spending and the volatility of government and foreign aid budgets, safeguarding resources for other purposes.

**Box 2: Using disaster risk financing schemes to manage drought risk in the Horn of Africa**

Countries in the Horn of Africa regularly experience major droughts that affect the populations and the budgets of governments and international partners. Experience shows that in drought years, countries in the region often wait until the effects of drought have manifested before appealing for international assistance. This approach presents various problems:

- **Timeliness:** Donor negotiations can be drawn out, causing money to arrive late. This also means that full-scale humanitarian response activities often start only with months of delay, causing prolonged suffering among affected populations.
- **Cost-effectiveness:** With the late arrival of support, people adopt negative coping mechanisms and animals die. Drought-related costs grow. These can be saved by responding earlier—various studies have shown the benefits of early response (e.g., USAID, 2018).
- **Predictability:** There is a great deal of uncertainty—recipient countries do not know how much funding they will ultimately receive and how much they must allocate themselves. This impedes long-term budget planning, as resources need to be reallocated ad hoc from other budget items in a disaster situation.
- **Accountability:** Donor funding can bypass government systems and government systems themselves may lack capacity for tracking flows in crisis situations, hampering overall transparency.

Different countries in the region have thus started to look at ways to improve the effectiveness of funding of disaster-related costs using pre-arranged financing solutions. This includes disaster contingency funds (e.g., Kenya), insurance schemes (Kenya, Ethiopia, Uganda), and contingent credit arrangements (Kenya). These yield improvements on the aspects listed above:
- **Timeliness**: Using technology (e.g., satellite observation), these instruments determine early on whether droughts occur and release payouts immediately—this money can be used for drought response without having to wait for lengthy donor negotiations.

- **Cost-effectiveness**: With funding available early and response activities starting without delay, rising drought-related cost can be avoided. Thus, the value for money of the funds invested in DRF solutions is higher than that of traditional humanitarian assistance.

- **Predictability**: As rules determine in advance when exactly funding will be made available and funds are not dependent on negotiations with an uncertain outcome, governments and donors can better plan their medium—and long-term finances—fiscal stability is enhanced.

- **Accountability**: Emergency funding provided through financial sector instruments such as insurance can be subject to traceable delivery methods such as mobile money.

40. **A growing number of governments are moving toward a proactive approach to financial planning.** This aims at protecting both national budgets and the lives and livelihoods of their citizens from the impacts of disasters. Under this approach, governments consider climate and other shocks as part of their fiscal risk management strategies.

41. **There is no single financing instrument that can address all agriculture risks; multiple instruments should be combined to ensure availability of resources when they are needed most.** Financial planning should follow a layered approach. This approach (represented schematically in Figure 12 and explained below) prioritizes the most cost-effective solution for different layers of risk and ensures that the most expensive instruments are used only for the extreme events that rarely occur.

- **Low-risk layer.** Frequent but low-impact events could be financed primarily through risk retention mechanisms in the form of a disaster fund, a dedicated budget line, or a contingency budget. If needed, some minor in-year budget reallocations could also be used.

- **Medium-risk layer.** Medium scale, less frequent events could be financed through contingent facilities that are typically provided by international financial institutions. Pre-agreed contingent credit arrangements allow governments to access liquidity quickly after a disaster.

- **High-risk layer.** The financial risk for extreme events that occur infrequently could be transferred to the international markets using instruments such as insurance or commodity hedges. Such risk transfer solutions tend to be relatively expensive but can unlock large amounts of funding when they are needed most.
42. Risk financing instruments can be categorized with those procured after disaster strikes (ex-post) and those that are prearranged (ex-ante). The characteristics of the instruments vary—they may be faster or slower to activate and generate greater or lesser volumes of funding. While it generally carries many benefits to establish ex-ante financing instruments, ex-post funding instruments such as budget reallocations and public borrowing can and will still be used to maintain a certain degree of flexibility. For example, smaller in-year budget reallocations can be a fast and relatively inexpensive financing instrument to finance costs from smaller, recurrent shocks. Also, the recent COVID-19 pandemic showed that for unexpected, exceptionally large shocks, public borrowing may be the only remedy to mobilize funding.

43. A national disaster risk financing strategy can be a useful base for a government to define its funding strategy for costs arising from disaster risks the country faces. Through its national strategy, a government can set policy priorities aimed at meeting post-disaster financing needs in a strategic way. A sound DRF strategy should be based on an in-depth analysis of risks, contingent liabilities, and the remaining risk management framework. Based on this analysis, it should then set out how response to the identified risks will be financed, and which instruments will be used, by priority and comprehensively, considering government priorities, capacity and the overall institutional arrangements in the country. A comprehensive DRF strategy will not only focus on the agriculture sector but will try to address all costs associated with certain risks (e.g., also reconstruction costs linked to potential floods). However, in countries where the agriculture sector plays an important role and is exposed to significant risks—as in all SADC Member States—risk financing instruments targeted at agriculture should feature prominently.

2.2 Existing national initiatives

44. The use of agriculture risk financing instruments is mixed across countries in the SADC region\(^\text{13}\). Only two countries in the region have adopted a comprehensive national

\(^{13}\text{Documentation on agriculture risk financing schemes in the SADC region is limited. The below builds on the documentation that has been reviewed as indicated.}\)
disaster risk financing strategy (Malawi, Madagascar). For shock response funding, most
countries focus on the use of traditional risk retention mechanisms such as a national disaster
fund and strategic grain reserves. Micro-level and macro-level risk transfer mechanisms have
emerged over the last two decades and are also used increasingly across the region (Table 11).

Table 11: Use of agriculture risk financing instruments across SADC Member States

<table>
<thead>
<tr>
<th>Country</th>
<th>DRF Strategy</th>
<th>Risk Retention</th>
<th>Risk Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botswana</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Comoros</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eswatini</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Lesotho</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Madagascar</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Mozambique</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Malawi</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Mauritius</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Namibia</td>
<td></td>
<td>22,900 mt</td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Seychelles</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Tanzania</td>
<td></td>
<td>150,000 mt</td>
<td>✓</td>
</tr>
<tr>
<td>Zambia</td>
<td>✓</td>
<td>500,000 mt</td>
<td>✓</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td></td>
<td>500,000 mt</td>
<td>✓</td>
</tr>
</tbody>
</table>

Source: Various sources.

Box 3. Malawi’s national DRF strategy

Malawi is exposed to a variety of natural hazards, with droughts and floods having the greatest im-
 pact on the country’s economy, infrastructure, and people’s livelihoods. The government of Malawi
(GoM) is working to strengthen its financial resilience to the impact of natural disasters by intro-
ducing financial instruments that can be used to respond to disasters of different severities and fre-
quencies. The GoM is also working to set up a Contingency Fund for Disasters, a Cat-DDO, and
sovereign insurance, and to expand the penetration of private catastrophe insurance and agricultural
insurance in the country.

Malawi’s Ministry of Finance, Economic Planning and Development is seeking to guide the adop-
tion of such instruments, and with technical support from the World Bank, has drafted a National
Disaster Risk Financing Strategy. It was adopted and signed by the Ministry in May 2019. The strategy outlines the actions for the GoM to adopt or strengthen various DRF instruments. It increases the transparency of, and strengthens decision-making on, different potential financial instruments that will help cover the costs of disaster response and reconstruction, while accounting for costs and benefits (GoM 2019).

The National Disaster Risk Financing Strategy in Malawi has helped the government define its priorities regarding financial planning for disaster response and to understand the steps needed to strengthen financial resilience.

45. Although the use of agriculture risk financing instruments is still limited, relevant analysis has already been conducted for many SADC Member States. Different SADC Member States have either conducted a Disaster Risk Finance diagnostic exercise (Lesotho, Eswatini or Madagascar), an Agriculture Sector Disaster Risk Assessment (Zimbabwe), or an Agriculture Finance Diagnostic (Zambia). In addition, the World Bank, together with partners from the FAO or WFP and supported by the donor community, has been driving for the past 5–7 years studies about disaster risk management solutions in SADC, identifying first the major risks to which countries are exposed and then the ex-ante and ex-post financing tools available to them to prepare and respond to a disaster impacting the agriculture sector. In all cases, findings indicated that countries rely heavily on (i) ex-post financial solutions to respond to disasters (extraordinary budget reallocations or humanitarian appeals); and (ii) reserve funds from national disaster response funds which are either replenished annually or on an ad hoc basis, often lacking sufficient funds to withstand a disaster. Aside from DRF diagnosis, targeted studies have been performed to see if more traditional disaster response mechanisms could be complemented by insurance solutions (weather index insurance or area yield insurance) in Tanzania, Mozambique, Malawi or South Africa. Except for South Africa, the findings indicated that (i) these solutions are not yet demand driven and are too expensive for farmers; (ii) key challenges include smallholder farmers’ awareness and understanding; and (iii) a sustained, medium term public-private partnership (including embedding insurance with other financial products) is the main solution to achieve the sustainability of a domestic agriculture insurance market.

2.2.1 Disaster funds

46. From the ex-ante menu of Disaster Risk Financing and Insurance (DRFI), working as “first line of defense”, disaster funds at the government level are the most used basket of resources for responding to agriculture sector emergencies. They earmark and set aside funds to respond to frequent and low severity agriculture crises. Table 12 gives an overview of national disaster funds in the region.

Table 12: Overview of national disaster funds in the SADC region

14 According to the initial diagnostic study “Toward a National Agricultural Insurance Program” (2016) led by the DRFI and GFDDR teams at the WB on behalf of GoSA, all three types of agriculture insurance programs (Multi-peril, Area Yield and Pasture Drought Index Insurance) are likely feasible from a supply side perspective. The government roles and fiscal costs for each intervention would vary and are dependent on the details associated with implementation. The Research Report on Agriculture Insurance (2018) led by Accenture Partners found that in terms of demand for agriculture insurance products, 85% of smallholder farmers are aware of the benefits of microinsurance and would be somewhat willing to purchase an insurance policy and more than 100,000 farmers would be directly interested in the livestock insurance products.
<table>
<thead>
<tr>
<th>Country</th>
<th>National Disaster Fund</th>
<th>Annual contribution to Contingent budget line</th>
<th>Managing Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eswatini</td>
<td>Disaster Management Fund</td>
<td>Not operational</td>
<td>National Disaster Management Agency (NDMA)</td>
</tr>
<tr>
<td>Lesotho</td>
<td>Contingency Fund</td>
<td>~US$6.5 million</td>
<td>MoF Disaster Management Authority</td>
</tr>
<tr>
<td>Madagascar</td>
<td>A budget line for unforeseen expenditure</td>
<td>General budget programming</td>
<td>National Bureau for Disaster Management Response</td>
</tr>
<tr>
<td>Mozambique</td>
<td>Disaster Management Fund (Fundo de Gestão de Calamidades - DMF)</td>
<td>US$4.5-5 million</td>
<td>National Institute for Disaster Management (INGC)</td>
</tr>
<tr>
<td>Malawi</td>
<td>National Disaster Risk Management Fund</td>
<td>2%-5% of the budget</td>
<td>Disaster Management Affairs (DoDMA)</td>
</tr>
<tr>
<td>South Africa</td>
<td>Contingency Reserve in budget</td>
<td>US$400 million (6 bn Rand)</td>
<td>National Treasury</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>Civil Protection Fund</td>
<td>US$5.2 million</td>
<td>MoFED</td>
</tr>
</tbody>
</table>

Sources: Various.

47. **National disaster funds in the region face different challenges:**

- Annual allocations/replenishments are mostly in the range of US$ 5–10 million, far below average exposure due to disasters that countries are experiencing—however, other financing mechanisms are often missing.
- The agriculture sector can be one of the beneficiary sectors of funds disbursed in case of disasters, but none of the amounts are earmarked further by sector/industry.
- Rules under which the funds are disbursed can be vague, leading to the depletion of resources early in the budgetary cycle—and limited availability of resources when disasters strike. The funds do not distinguish between weather risks and other types of risks (animal/plants pests and diseases or price shocks).
- Despite the existence of disaster funds, disaster risk management strategy tends to enable the reallocation of funds toward response on an ad hoc basis. Budget reallocation remains the primary source of financing shock response at the national level, which often leads to funding shortages from where the money was transferred and can be slow and non-transparent.

**Box 4. Mozambique’s Disaster Management Fund**

Mozambique is heavily exposed to multiple natural hazards, especially floods, cyclones, droughts, and earthquakes. The annual average damage caused by natural disasters between 2000 and 2014 was estimated to be US$188.3 million. The negative impacts of climate and disaster shocks are exacerbated by high levels of poverty; in 2014, the country’s poverty rate stood at 62.9 percent (based on the US$1.90/day 2011 PPP poverty line).
For the financing of emergency response, to larger events, and post-disaster recovery and reconstruction, the GoM had relied on ex-post instruments, such as ad hoc budget reallocations and the mobilization of donations or loans from the donor community, which tend to be slow to materialize and remain insufficient to cover post-disaster recovery needs.

Recognizing this challenge, the GoM approved the creation of the national Disaster Management Fund (Fundo de Gestão de Calamidades) in October 2017 and is working toward operationalization. This fund is a dedicated account managed by the National Institute of Disaster Management (INGC). It is expected to receive annual budget allocations of at least 0.1 percent of the state budget (a minimum annual allocation of about US$4.5–5.0 million). The World Bank will top up the fund’s allocation with an additional annual amount of US$9 million in the fund’s first two years and with US$5 million in the following three years. The goal is to increase the availability and predictability of resources for emergency preparedness and response and make room for financing of recovery.

With technical assistance from the World Bank, the GoM has elaborated draft regulations that will govern the Disaster Management Fund. The fund will only be able to support immediate disaster preparedness and response activities. This support will be provided in kind and will be procured through pre-agreed contracts to speed up the response to disasters. The fund has been designed so that it can purchase a sovereign parametric catastrophe insurance product, which could provide an important backstop in the event of a large disaster. The regulations also specify, among other things, the mechanism for triggering the use of fund resources; the rules for requesting resources from the fund; requirements of pre-negotiated contracts for the delivery of specified goods; requirements for auditing the use of funds and transparency; and the concentration of fiduciary responsibility for the fund at INGC.

2.2.2 Strategic Food Reserves

48. SFRs store food (in physical or virtual form) for times of need, enabling the authorities to respond swiftly when emergencies strike and distribute food to the affected population. The rationale of SFRs is clear—during a crisis, they can provide rapid in-kind relief to the most vulnerable and thus improve food security outcomes. For this purpose, the general international consensus is that SFRs can be an effective instrument if managed properly for humanitarian (food aid) reasons. They need to be differentiated from buffer stocks which also store grain but whose primary objective is the stabilization of prices. However, this has generally been judged to be an ineffective tool, and almost all developed countries have abandoned them (see below) (World Bank, 2012).

49. Many countries across the SADC region have established SFRs, though sometimes with mixed objectives. Standing SFRs could be identified in seven SADC countries (Table 10). Their sizes vary widely, ranging from only 22,900 mt storage capacity in Namibia to 250,000 mt in Malawi and 500,000 mt in Zambia and Zimbabwe. This great variation is explained by different objectives—while Namibia uses its SFR for food security during emergencies only, Malawi, Zambia, and Zimbabwe have large food price stabilization programs in place, for which they also use their food reserves to intervene in the market. For these countries, the food reserve is used both as a SFR (an emergency stock) and as a buffer stock (a price stabilization mechanism).

50. International experience holds that successful SFRs should be run by an independent agency, subject to objective triggers, linked to safety-net programs for delivery, and reliably sourced. An SFR to improve food security outcomes is essentially a technical, not a political agency. It should thus be largely isolated from political processes, with the objective,
well defined, clear and transparent triggers, supported by an early warning system and a pre-defined delivery mechanism. The more objective and clearer it is in advance of the occurrence of a food security event when the SFR will be activated and how food will be delivered to whom, the faster and more reliable the execution of delivery will be in the event of a crisis, thus strengthening overall food security outcomes. Delivery to beneficiaries should be done through an existing social protection system to save time and resources. The SFR must also be reliably resourced. This requires preparatory analysis of the required food stocks in the event of a food crisis and the integration of the SFR into a broader food security management framework, e.g., via a disaster or agriculture risk financing strategy (FAO et al., 2011).

2.2.3 Rural shock-responsive safety nets

51. Shock-responsive safety nets are safety nets that can rapidly scale horizontally (increase the coverage of beneficiary households) or vertically (increase transfer amounts to regular beneficiaries) when an agriculture emergency occurs. Many countries have some form of social protection systems in place that provide resources to the poorest, e.g., conditional or unconditional cash transfer programs, agriculture input support programs, cash-for-work, etc.

52. While shock-responsive safety nets are still a new concept in Africa, some countries have implemented them tied to objective early triggers. The scale up mechanism can be activated via an objective, pre-defined trigger—for example, satellite data that monitors drought conditions: when rainfall in an observed area drops below a certain threshold, the trigger is activated and the safety net scaled out automatically to cover the most affected. In Africa, this approach has so far been rolled out at larger scale out by governments in Kenya, Niger and Uganda.

Box 5. Scalable safety net in Uganda—the case of NUSAF

The Northern Ugandan Social Action Fund (NUSAF) is a World Bank-funded social safety net for the poorest in Uganda, aiming to provide effective income support and build their resilience. It includes a labor-intensive public works component that provides cash transfers to poor and vulnerable households in return for their participation in public works.

In 2015, NUSAF became shock-responsive to droughts. Karamoja in the north-east, is the poorest region of the country, home to nomadic pastoralists and exposed to frequent severe droughts. In this region, additional drought-affected households are added to the labor-intensive public works component when a drought occurs. There are two triggers. The primary trigger is based on a rangeland condition index monitored by satellites (Normalized Difference Vegetation Index, NDVI). When rangeland conditions become too dry during the season, additional households are added to the program from a preselected roster of vulnerable and poor households. In addition, the government also decided to implement a secondary soft trigger, meant to account for potential failure of the primary hard trigger. If the primary trigger is not activated, the government waits for the Integrated Food Security Phase Classification (IPC) report which is prepared on an annual basis by a consortium of international humanitarian actors. If the IPC report describes the occurrence of a humanitarian crisis in the Karamoja region, the government can decide to scale up the safety net regardless. For example, if the primary NDVI trigger is subject to a basis risk event, where no drought is detected at a regional level while it might be extreme at a local level, the government can still react via the secondary trigger (World Bank, 2018).
53. **There are several benefits to this approach, the main ones being speed and greater cost effectiveness.** The approach harnesses the power of automaticity: by predefining as much as possible in advance when the scale up mechanism will be activated, who will be targeted, and how the resources will be delivered to beneficiaries, valuable time is saved from decision-making during a crisis. By using objective data as a trigger, the process is isolated from potential political influence, it is transparent, reliable, and fast. Meanwhile, the use of existing safety net program infrastructure to reach beneficiaries ensures the cost effectiveness of the response.

54. **Some SADC governments have started to work on establishing scalable safety nets and pre-allocating funding in the event of an agriculture emergency.** Countries that have started implementing scalable safety nets for faster shock response include Madagascar and Malawi. Some countries such as Eswatini and Lesotho are exploring options in this regard. Madagascar and Malawi have also allocated a specific contingent budget to their scalable safety nets. Similar to a disaster fund, they are reserve resources that will be disbursed in case of a shock (Table 13).

**Table 13: Pre-allocated funds to shock-responsive safety nets in the SADC region**

<table>
<thead>
<tr>
<th>Country</th>
<th>Social Safety Net</th>
<th>Covered shocks</th>
<th>Annual contribution to contingent budget line</th>
<th>Managing Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madagascar</td>
<td>Fonds d'intervention pour le développement (FID)</td>
<td>Natural disasters (drought, flood, cyclone) causing food insecurity</td>
<td>0.3% of the national budget</td>
<td>Ministry of Population, Social Protection and Promotion of Women</td>
</tr>
<tr>
<td>Malawi</td>
<td>National Disaster Risk Management Fund</td>
<td>Weather-related shocks</td>
<td>2% of the national budget</td>
<td></td>
</tr>
</tbody>
</table>

Sources: Various.

2.2.4. **Contingent credit**

55. **Contingent lines of credit are the next line of defense for governments to respond to the impact of disasters and food security emergencies.** Contingent lines of credit are loans whose terms are negotiated during non-crisis times and that become available to the loan taker immediately upon the occurrence of a pre-defined event. In many cases, if a disaster strikes in the agriculture sector, funds are released as budget support, usually following a declaration of a state of emergency.

56. **The World Bank’s contingent credit line is called Development Policy Loan with a Catastrophe Deferred Drawdown Option (Cat DDO).** This is a contingent financing line that provides immediate liquidity to countries to address shocks related to natural disasters, or health-related events. It serves as an early financing instrument, while funds from other sources such as bilateral aid or reconstruction loans are being mobilized. To gain access to the CAT DDO, the recipient must have (i) an adequate macroeconomic policy framework; and (ii) be preparing (or already have) a satisfactory disaster risk management program. The disaster risk management program should address at a minimum natural disaster risk and may include health-related events. From the SADC Member States, only Malawi and Madagascar have a
CAT DDO product for US$70 million and US$50 million respectively, and both were fully disbursed in April 2020, to respond to the COVID-19 outbreak.

57. **Advantages and disadvantages.** The main advantage of pre-arranging a contingent credit contract is that it can ensure rapid disbursement as budget support for countries to respond to the effects of disasters in the aftermath. However, given that the funds are budgetary support, these products usually require some efforts from the country to have a macroeconomic policy in place demonstrating fiscal stability and a disaster risk management strategy explaining how the funds are channeled through national disaster funds to reach the affected population.

2.2.5 National agricultural insurance schemes

58. **Insurance solutions benefiting agricultural producers can be issued at the micro, meso, or macro level.** Insurance approaches can be disaggregated by target group. Micro-level agricultural insurance solutions can be purchased by smallholder farmers themselves. Meso-level agricultural insurance solutions are purchased by medium-level aggregators in agriculture finance such as microfinance institutions (MFIs) or cooperatives. They tend to use insurance to increase access to credit for farmers and also to protect their lending portfolios to agricultural producers. These two forms of agricultural insurance (micro and meso-level) are covered in this section. Macro-level or “sovereign” insurance solutions target national or subnational governments as policyholders, which can in turn use payouts to protect agricultural producers. They are covered in the next section (“Regional insurance initiatives”).

59. **Agricultural insurance is a risk transfer tool that farmers and other stakeholders can use to manage risks at the farm level.** For specific hazards, agricultural insurance products transfer a share of production risk to another party in return for a fee (or premium). Agriculture insurance can thus protect farmers from the impacts of production shocks through the provision of timely payouts in the event of a calamity. Agriculture insurance therefore reduces the exposure of the farmer to production risk, thereby potentially unlocking access to agricultural credit for farmers who were previously not creditworthy. In many countries, agricultural insurance has played a significant role in expanding access to credit for farmers.

60. **Agricultural insurance can also improve the efficiency, transparency, predictability and cost effectiveness of public sector financing of agriculture emergency relief efforts.** By transferring risk to the private sector, agricultural insurance can ensure the rapid delivery of financial relief to those affected by systemic shocks. Working through the private sector and agreeing on clear payout rules and delivery mechanisms beforehand can increase financial transparency and ensure public accountability. It also creates predictability. From the perspective of beneficiaries, agricultural insurance can make relief efforts more foreseeable, creating space for individual financial planning. Likewise, for the government, transferring a well-defined financial risk from its balance sheets can enhance the clarity of budgeting decisions. Agricultural insurance can also reduce short term, emergency-related costs to government, ensuring that the private sector (sometimes backstopped by government as a final risk bearer) provides relief efforts to the agriculture sector in times of catastrophic need.

61. **Based on international experience, agricultural insurance schemes are most successful when organized as a public-private partnership (PPP).** In successful agricultural
insurance schemes, both the private sector and the public sector take on roles in which they have comparative advantages. For example, without support from the public sector, the required data for insurance can be prohibitively expensive or technically difficult for private sector insurers to obtain. Conversely, the government tends to lack technical expertise, is prone to political influence, and has insufficient coverage due to weak infrastructure for policy distribution and paying insurance claims. A PPP builds on the comparative advantages of both the public and the private sector. This is demonstrated by successfully scaled-up agricultural insurance schemes around the world such as in India, Mongolia and Morocco. It is also the approach taken by national agricultural insurance schemes in Kenya and Uganda.

62. Experience suggests that the implementation of agricultural insurance is most efficient and effective if it is managed by the private commercial sector. Key tasks in the provision of agricultural insurance in which private sector actors tend to be most effective include (i) the collection and management of reliable agricultural data, such as yield data, weather data, remote sensing data, and livestock ownership and mortality data; (ii) marketing and distributing of insurance products; (iii) designing and pricing of insurance products; (iv) underwriting the risk; (v) claims management and loss adjustment; and (vi) making decisions concerning risk retention and reinsurance strategies (World Bank, 2014). These tasks are schematically displayed in Figure 13.

63. Private sector partnerships are vital for scaling the distribution of index insurance products and for raising awareness among smallholders. Agricultural insurance companies often benefit from partnerships with organizations trusted by smallholder farmers to market their services. In SADC, both ACRE Africa and Pula offer their index insurance services through agro dealers who play a vital role in educating farmers on both the value and operations of agriculture insurance. Similarly, in Zimbabwe Econet relies on existing Zimbabwe Farmers’ Union (ZFU) field agents in farming communities to promote and register farmers for its bundle of services. Collaborating with trusted organizations to distribute their services has enabled insurance providers to raise awareness about their services, and expand their customer base.

Figure 13: Potential roles of private sector actors in scaled up agricultural insurance PPPs

64. Meanwhile, successfully scaled up agricultural insurance programs typically require leadership and targeted support from government. Areas of agricultural insurance provision that tend to benefit greatly from committed government support include (i) the collection and management of reliable data; (ii) reaching out to potential policyholders through financial literacy campaigns or by bundling agricultural insurance with existing distribution channels, such as publicly supported agricultural loans; (iii) partial public reinsurance for private insurers; (iv) the promotion of coinsurance pools through which private sector insurers can collaborate in areas where it is economically efficient for them to do so; (v) providing technical expertise in insurance product design and development; and (vi) the establishment and implementation of an enabling legal and regulatory framework (World Bank, 2014). These are schematically displayed in Figure 14.

Figure 14: Potential roles of the public sector in scaled-up agricultural insurance PPPs


65. SADC countries have rarely explored and developed the various types of agriculture insurance products that could protect many of their farmers and herders against shocks. Where such products have been implemented, the risks insured are weather-related shocks. The only exception is South Africa, where a dedicated livestock index insurance product covers against the increased mortality of livestock, including animal disease outbreaks (Table 14).

Table 14: National agricultural insurance schemes in SADC Member States

<table>
<thead>
<tr>
<th>Country</th>
<th>Weather Index Insurance (WII)</th>
<th>Area Yield Index Insurance</th>
<th>Livestock Index Insurance</th>
<th>R4 Initiative (WII)</th>
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</thead>
<tbody>
<tr>
<td>Angola</td>
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<td>Botswana</td>
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<td>DRC</td>
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<td>Eswatini</td>
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15 This table excludes traditional indemnity insurance schemes as these tend to be unsuited to the vast majority of farmers in SADC countries.
66. There are different types of agricultural insurance, suited to different types of farmers (commercial farmers vs. smallholder farmers), agricultural products, or hazards (mostly are weather related). They can be divided into indemnity and parametric (index) insurance products.

67. **Indemnity insurance**: These traditional products compensate policyholders for losses incurred due to specific or multiple perils. Indemnity insurance is a useful tool for commercial farmers as the premium it generates is enough for insurance companies to cover post-disaster loss verifications. Due to a lengthy claim assessment process and the fact that indemnity insurance covers the real losses incurred by each farmer, it can be expensive, with a longer claim settlement process and is thus impractical for rural populations.

68. **Index insurance**: These are products that link insurance payouts to a proxy for incurred losses in the form of an index.

- **Weather Index Insurance (WII)**: These products provide payouts to crop farmers when rainfall levels (as a proxy for drought for example) are measured by weather stations. The key benefits of these programs over traditional indemnity insurance are that they minimize moral hazard and do not require loss adjustments, since payout decisions are based on the rainfall proxy (see e.g., Box 6 as an example). The key challenge faced by WII is basis risk, in other words, a potential mismatch between an index value and localized conditions. For example, a weather station may indicate that an observed region overall is not suffering from drought, although some pockets can be severely affected. Therefore, even though his production was affected by lack of rainfall, the insurance payout to the farmer may not be triggered. On the other hand, the index may correctly detect the occurrence of a drought for the observed area overall, but individual farmers who receive payouts within that area may in fact not have been affected due to beneficial microclimates.

- **Area Yield Index Insurance (AYII)**: For this crop insurance type, the total cropping area is divided into agro-ecologically homogeneous “unit areas of insurance” (UAI), each of which contains multiple farmers. The policy provides an insurance payout to an insured farmer if average crop yield in his UAI falls below a certain threshold. As it is linked to yield rather than a specific hazard, AYII covers all risks to production. AYII is often an appropriate product for smallholders and semi-commercial farmers as it covers all risks, tends to be more cost-effective than traditional indemnity insurance, and lowers basis
risk compared to WII. Like WII, it also minimizes moral hazard and anti-selection problems. Key challenges for implementing AYII tend to be that it requires historical yield data at the UAI level, to be able to price the product. Implementation also tends to be more expensive and complex than WII as the average yield for each UAI must be assessed after the harvest.

- **Pasture drought index insurance**: An insurance product that uses satellite data that tracks the amount of green forage on the ground. When the data indicate during the season that there is not enough forage available for animals, insured livestock producers receive a payout to help them finance the cost of keeping animals alive.

**69. Different agricultural insurance products are suited to different contexts.** Each agricultural insurance product comes with different advantages and disadvantages. While these cannot be explored in depth here, it should be noted that traditional indemnity-type insurance products are often unsuited to the needs of low- and lower middle-income countries. As already noted, they tend to be expensive, especially in remote areas, as losses must be assessed individually for each farmer and loss event. Potential problems also include “moral hazard”, i.e., the incentive for policy-holding farmers to neglect their produce as they are covered by insurance anyway, and “adverse selection”, i.e., the tendency of the most-affected farmers to seek insurance, which can drive up the premium price. If designed carefully, index insurance solutions can address some of these challenges.

**70. New agricultural insurance schemes should be based on an initial feasibility study of specific sector needs and characteristics to identify the most appropriate products and program structure.** In countries where the uptake and penetration of agriculture insurance products are in the early stages, the World Bank often supports governments to conduct agricultural insurance feasibility studies that aim to inform relevant government entities on the required steps to establish a successful national agricultural insurance public-private partnership. SADC Member States that have initiated such discussions to obtain support for the strengthening of their national agriculture capacity include Lesotho, Angola and Malawi.

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**Box 6: Zambia’s Weather Index Insurance**

In March 2016, the International Finance Corporation (IFC) signed a capacity building grant agreement with a private insurer registered in Zambia, Mayfair Insurance. The grant was financed by the Global Index Insurance Facility—a multi-program trust fund managed by the WBG and funded by the European Commission/the African, Caribbean and Pacific (ACP) Group of States; the Dutch Ministry of Foreign Affairs; the German Federal Ministry of Economic Cooperation and Development (BMZ); and the Japanese Ministry of Finance. The grant enabled Mayfair to build their capacity to develop and sell weather-based insurance products that would be used to cover vulnerable farmers against weather-related crop losses. The covered crops were soybeans, groundnuts, peas and cotton.

Following a competitive bidding process in November 2017, Mayfair was contracted by the government of Zambia to develop insurance products that would be bundled together with the government input subsidy package under the Farmer Input Subsidy Program (FISP), which is a dedicated PPP, running for over 20 years. The stated objective of the FISP is to “improve the supply and delivery of agricultural inputs to small-scale farmers through sustainable private sector participation at affordable cost, to increase household food security and incomes by expanding markets for private sector input suppliers/dealers, ensuring timely, effective and adequate supply of inputs and fertilizers and serving...”
as a platform for risk-sharing for small-scale farmers to cover part of the cost of improving agricultural productivity”. (Source: Ministry of Agriculture 2016. 2016/17 FISP implementation manual)

Through FISP, each farmer pays ZMW 400 (US$42), and the government pays ZMW 1,700 (US$177). The farmer receives ZMW 2,000 (US$209) in seeds and fertilizer, and ZMW 100 (US$10) covers the premium for the weather-index insurance, which pays out if weather conditions cross pre-defined parameters. This way, farmers benefiting from FISP would receive compensation equal to the value of the inputs in case of drought, improving their resilience. GIIF extended support to Mayfair for additional product development, training and awareness-raising activities.

By January 2018, Mayfair had covered about 1 million farmers, which is the largest number insured in one season by any GIIF grantee. Since September 2019, GIIF has also extended support to the insurance regulator—the Pensions and Insurance Authority (PIA)—for the development of a capacity development program for the entire insurance market.

Box 7: R4 Initiative (WFP)

WFP and Oxfam America launched the R4 Rural Resilience Initiative (R4) in 2011 to enable vulnerable rural families to increase their food and income security by managing climate-related risks. R4 is an integrated risk management strategy that combines four risk management components: improved resource management through asset creation (risk reduction), insurance (risk transfer), livelihoods diversification and microcredit (prudent risk taking), and savings (risk reserves).

R4 links labor-based safety nets that provide cash or food in exchange for work on community projects with community risk reduction activities that protect assets against disasters and improve productivity. Farmers participating in R4 will have access to tools to build physical resilience to weather-related shocks, and they will exchange work for enrollment in the insurance program. When a drought hits, compensation for weather-related losses prevents farmers from selling productive assets and stimulates faster recovery.

As of 2019, R4 reached over 87,000 farmers (about 450,000 people) in Ethiopia, Kenya, Malawi, Senegal, Zambia and Zimbabwe. In 2018, around US$1.5 million of insurance payouts were distributed through the initiative in Ethiopia, Kenya, Malawi, Senegal and Zambia to compensate for weather-related losses.

2.2.6 Weather derivatives

71. **Weather derivatives are financial contracts designed to provide compensation for financial loss to an entity affected by weather volatility.** Weather contracts are based on measurable weather events such as excessive or insufficient rainfall, temperatures (extreme heat or cold), or tropical storms, hurricanes, cyclones, and typhoons. The World Bank offers index-based weather derivatives as part of a broad spectrum of disaster risk financing instruments designed to assist member countries in planning efficient responses to natural disasters. Weather derivatives and index-based weather insurance (described in the previous section) have the same underlying technical design, but they operate within different regulatory frameworks: the former as a financial production and the latter under insurance regulations.

72. **Many countries with a significant agricultural sector use index-based weather models to monitor agriculture production risk and forecast production.** A weather derivative contract can, for instance, help a country transfer a portion of the risk of severe drought to the international financial markets, by using rainfall as a proxy for loss. A country wishing to hedge a specific weather risk purchases a derivative contract by paying a premium upfront. The
seller of the derivative contract accepts the risk of the adverse event occurring in exchange for the premium, similar to an insurance contract. The buyer receives a payout if the index crosses a specified threshold before the end of the contract period.

73. In general, weather derivatives are most cost-effective for covering low-probability events with severe impacts, such as catastrophic droughts, and should be embedded into a broader risk financing framework. These derivative contracts can be customized according to a country’s specific needs based on the type of weather hazard, desired level of protection, and estimated financial loss associated with the event. Malawi was one of the first countries in the SADC region to experiment with the use of a weather derivative (Box 8). A key lesson from the Malawi case was that such contracts should not be entered into in isolation. Instead, they should form part of a broader DRF strategy that details a financing plan for the cost of all DRF instruments and that ensures that not only the least frequent, most extreme events are covered but also provides a way forward for financing high-frequency low-impact events.

Box 8: Malawi’s index-based weather derivative

Malawi is heavily exposed to the risk of drought and food shortage. The World Bank and other development partners have been supporting Malawi’s efforts to strengthen food security through agricultural technology, investments in irrigation, and the development of grain markets. In the mid-2000s, Malawi expressed interest in finding ways to mitigate the impact of drought on the economy and the federal budget. The country needed to access funds quickly in the event of a severe and catastrophic drought, thus reducing dependence on humanitarian appeals.

The World Bank responded by helping the government transfer a portion of the risk of severe drought to the international financial market using weather derivatives. The 2008–2009 transaction marked the first time that the World Bank offered a financial risk management derivative to a low-income country.

The weather derivative contract purchased by the government of Malawi was structured as an option on a rainfall index. The index linked rainfall and maize production, so that if precipitation fell below a certain level, the index reflected the projected loss in maize production. If maize production in Malawi, as estimated by the rainfall index, fell significantly below the historical average, Malawi would receive a payout. The World Bank acted as an intermediary between Malawi and reinsurance companies or investment banks for this transaction.

The government of Malawi renewed the contract twice (2009-10 and 2010-11). Notably, the weather derivative contract provided coverage for a specific percentage of drought risk in Malawi, as part of a broader (maize) risk management program.

2.3 Existing agriculture and disaster risk financing regional initiatives

74. Risks to agriculture are no news to the SADC region, and there have been various initiatives to improve regional risk financing arrangements. Initiatives include a regional food reserve facility that has been discussed since the 1980s but still has not been set up, and other risk-sharing schemes such as a regional insurance facility. Recent activities include:

- On August 7–8, 2017, the SADC Secretariat and the African Risk Capacity (ARC) organized a “Regional workshop on Disaster Risk Financing” at the Capital Empire Hotel in Johannesburg, drawing senior officials from almost all Member States;
On October 25–27, 2018, the Common Market for Eastern and Southern Africa (COMESA), in collaboration with the World Bank, organized a “Regional Forum on Climate Risks and Food Security Resilience” in Lusaka that highlighted the importance of disaster risk financing.

On August 5–6, 2019, the Southern African Confederation of Agricultural Unions (SACAU), with support from the Technical Centre for Agricultural and Rural Cooperation (CTA), organized a workshop on “Promoting regional risk pooling at regional level” in Johannesburg and formed a multi-stakeholder working group on the issue.

On October 3, 2019, the SADC Secretariat and the Secretariat of the African Risk Capacity (ARC) signed a three-year memorandum of understanding (MOU) to work together on issues pertaining to disaster risk financing.

In June 2019 and March 2020, the World Bank organized Agriculture risk financing Innovation Challenges for the Southern African region.

From 2015 to 2019, the World Bank executed the EU-financed “Africa Disaster Risk Financing Initiative” (ADRF) which supported a number of countries across the continent, including in the SADC region, in assessing risk exposure and developing adequate risk financing solutions.

2.3.1 Regional guidance on disaster risk financing

75. Some regional guidance by the SADC Secretariat already highlights the need for disaster risk financing solutions. For example, the draft SADC Regional Resilience Strategic Framework 2019 acknowledges the important role risk financing instruments play for managing disaster risks (SADC, 2019b). SACAU also reports that the draft version of the SADC Disaster Risk Reduction Strategy and Action Plan 2020–2030 calls for risk financing initiatives across the region (SACAU, 2019).

76. During a regional workshop on disaster risk financing in 2017, participants identified the need for further guidance on disaster risk financing from the SADC at the regional level. The “Regional Workshop on Disaster Risk Financing” was hosted by the SADC and ARC Secretariats and brought together government officials working on disaster risk reduction, response, and financing from all SADC Member States except for Namibia and the DRC, as well as representatives from African official institutions, development partners, civil society, and academia. Among the key results from the workshop, it was held that the SADC Secretariat should develop guidelines for Member States on their engagement with partners working on disaster risk financing. Participants also agreed that the SADC Secretariat should be more proactive in developing regional response plans for major disasters, and play a leading role in helping to mobilize resources (SADC and ARC, 2017).

77. In October 2019, the SADC Secretariat entered into an agreement with ARC on disaster risk financing in the region that also aims at strengthening regional guidance on risk finance. The memorandum of understanding (MOU) aims at integrating risk financing into regional policy frameworks, exchanging early warning data, using the ARC model for SADC vulnerability assessment and analysis, improving SADC climate modeling tools, and building regional disaster risk financing capacity (SADC, 2019c).
2.3.2 Regional agriculture risk sharing

78. **There have been some discussions regarding the creation of a regional disaster risk sharing mechanism specifically for the SADC region.** After the workshop with ARC in 2017, the head of the SADC Disaster Risk Reduction Unit raised the possibility of a regional disaster insurance mechanism that would be submitted to the relevant SADC structures for approval (SARDC, 2017). The October 2019 MOU between SADC and ARC also holds that the organizations will collaborate on building regional disaster risk management and financing capacities, mechanisms and tools for risk insurance facilities to address both humanitarian and infrastructure reconstruction and recovery needs (SADC, 2019c).

79. **In August 2019, a working group was formed to advocate for policy prerequisites for a regional risk pooling facility for agricultural weather index insurance.** Over the last two decades, agricultural weather index insurance has been provided as a risk transfer option to farmers in different countries across the region. One challenge faced by insurers is that insurance regulatory regimes across countries tend to not be aligned, which impedes risk pooling across countries and prevents potential lower premiums for policyholders. To address this issue, SACAU held a workshop in Johannesburg in August 2019 on “promoting risk pooling at regional level”, drawing farming and insurance industry representatives. As a key result, a multi-stakeholder working group was formed comprising members from farmers’ organizations, reinsurers, development partners, and sector experts. The main objective of the working group is to advocate for a regional policy and regulatory framework that would facilitate risk pooling by insurers in the region, with a view to increase access to agricultural insurance products across the region and lower premiums. The SADC Secretariat is seen as the key institution to lobby (SACAU, 2019).

2.3.3 Regional insurance initiatives

80. **Regional sovereign risk pools are also emerging as useful mechanisms to provide countries with cost-effective response funding.** Regional sovereign risk pools are country-owned mechanisms that provide insurance-like cover in the case of disasters to their members. Prominent examples that have emerged over the last decade include the Caribbean Catastrophe Risk Insurance Facility (CCRIF SPC), the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI), and the African Risk Capacity (ARC).

81. **Sovereign risk pools can provide rapid funding in case of disasters and offer insurance cover at lower cost than commercial solutions.** The main advantage of sovereign risk pools for the countries in the pool is that—by being country-owned and by pooling risk exposure across countries—they can offer insurance at lower prices than private financial markets. They can also (i) build regional reserves to finance losses from small- and medium-size events; (ii) attract donor support to capitalize a fund; (iii) pool country-specific disaster risks into one diversified portfolio, thus allowing access to international reinsurance markets on better terms.

16 Members include: SACAU (Regional Farmers’ Organisation and Chair); International Finance Corporation (IFC); International Food Policy Research Institute (IFPRI); African Risk Capacity (ARC); The Common Market for East and Southern Africa (COMESA); Southern African Development Community (SADC); South Africa Insurance Association (SAIA); Swiss Re; Atchison Actuaries & Consultants; Santam Insurance; GIC Re SA Ltd; and industry experts.
than if each country approached the markets individually; and (iv) build a better foundation of risk information and management (World Bank, 2017). On the other hand, these pools initially require investments in fixed costs to set up the pool, as well as significant technical expertise to design and price the line of products.

82. **The African Risk Capacity (ARC) is the only sovereign risk pool that offers governments insurance against droughts.** ARC is a Specialized Agency of the African Union established to help African Union governments to improve their disaster planning, preparation, and response capacities. Participating countries pay annual premiums. ARC uses satellite weather surveillance to estimate the crop yields of vulnerable farmers at the end of the season and, using vulnerability data, estimates the number of people in need of drought-related food aid. When the estimate reaches a minimum threshold of people who require food assistance, the respective country receives an insurance payout to use for related response activities. Because severe events do not happen at once across the continent, pooling risk among different countries can significantly reduce the cost of financing emergencies and decrease the reliance on external aid.

83. **Six SADC Member States are ARC Member States and three have so far purchased insurance from ARC.** Lesotho, Madagascar, Malawi, Mozambique, Zambia and Zimbabwe have all signed the MOU with ARC to become members of the institution. Malawi participated in the ARC risk pool for the 2015/16 agricultural season and received US$8.1 million as a payout to respond to drought. For the 2019/20 agricultural season, Madagascar and Zimbabwe are participating in the ARC risk pool.

84. **Another ARC product is the “ARC Replica”, through which the ARC drought coverage can be expanded to responding humanitarian or NGO partners.** ARC Replica is an insurance product that can be purchased by humanitarian actors such as WFP or the START Network and that mirrors the ARC insurance terms for a given country. ARC Replica cover has so far been purchased in 2019 for the West African nations of Burkina Faso, The Gambia, Mali, Mauritania, and Senegal. Under this policy, ARC just announced a series of indemnity payments from the ARC Replica insurance cover to Senegal in November 2019 and April 2020 to compensate vulnerable populations against the effects of drought. ARC Replica is also available for the SADC region but so far has not been used for any of the Member States.

2.3.4 SADC Regional Disaster Preparedness and Response Fund

85. **In 2017, the SADC Council of Ministers adopted the “Regional Preparedness and Response Strategy and Fund 2016–2030”, calling for a regional-level disaster fund**\(^\text{17}\). The document establishes three priority areas of work for the SADC Secretariat on disaster preparedness and response (SADC, 2016): (i) improving risk and information systems; (ii) strengthening disaster preparedness and response capacity; and (iii) establishing the “Disaster Preparedness and Response Fund”. Under (i) and (ii), the SADC Secretariat would support, among other things, improving regional and national disaster information management systems; supporting the development of national risk profiles and of a regional risk profiles; improving early

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\(^{17}\) For the purposes of this note, only the final draft of the document that was submitted to the Council of Ministers for decision-making could be reviewed (SADC, 2016).
warning and early action capabilities; establishing effective regional preparedness and response planning, including via a regional contingency plan; and establishing a SADC Humanitarian and Emergency Operation Centre (SHOC).

86. **The fund as envisaged by the strategy aims to greatly enhance SADC’s capacity to respond effectively to natural hazards, but it is subject to significant challenges.** Its objective is to “enable SADC effectively and timely address life-saving and life-sustaining support to victims of natural disaster situations that occur in the region through provision of immediate financial support”. The document envisages it as a revolving fund that would provide financial relief to Member States that are particularly severely affected by a natural hazard. However, the major challenges of the fund as envisaged by the document include: (i) the envisaged size of the fund itself (US$1.9 million or 5 percent of SADC annual budget) and the size of emergency payouts (US$300,000) are small in the face of the hundreds of millions of dollars of annual need; (ii) there is no recognizable sustainable strategy for resourcing the fund. It would be financed through voluntary member state and donor contributions bearing the significant risk of under-resourcing the fund; (iii) disbursement is based only on “soft” triggers, building on requiring a Member State to declare a “state of disaster” that “the disaster event overwhelms the capacity of the affected member state to respond”. While such “soft” triggers can be a useful element to maintain a certain degree of funding flexibility, international experience shows that wherever possible, disbursement triggers should be based on objective, data-based, pre-agreed thresholds that automatically trigger a payout when certain conditions are detected. This is not the case for the envisaged fund; and (iv) expenditure rules are largely unclear. The criteria for the disbursement of funds would ideally be to the greatest extent pre-agreed, e.g., via lists of eligible expenditures. The document does not refer to such rules, however.

87. **To date, the fund has not been set up and the next steps are unclear.** The operationalization of the fund has not progressed so far.

2.3.5 SADC regional strategic food reserve

88. **A regional strategic food reserve can be an efficient instrument for alleviating food insecurity during times of stress.** A regional food reserve held for use during emergencies, as an alternative to national reserves, pools food insecurity risk as food production shocks are imperfectly correlated across Member States (Koester, 1986). Regional strategic food reserves can also make use of economies of scale as administrative cost are shared and have thus been advocated for by researchers and the international community as means to counter food insecurity (e.g., Wright and Cafiero, 2011; FAO et al., 2011).

89. **Typical challenges in establishing and operating a regional strategic food reserve include technical, logistical, governance, and political issues.** Regional strategic food reserves must be stocked appropriately (physical or virtual stocks) for the risks that they are supposed to cover—too many stocks exacerbate cost, too few stocks undermine effectiveness. The right level is established by thorough technical analysis requiring reliable data. Furthermore, a strategic food reserve must be designed such that food stocks can be delivered rapidly and effectively to affected regions in all countries. This can be challenging in environments with a limited road and rail network. Governance of the facility, including rules for management, financial contributions, and receipt of physical food stocks, must be clear and agreed on by all
members. Given these governance issues, some have argued for an international organization such as WFP to take over management of regional SFRs. Finally, there are political issues to be considered where food security and food prices tend to be politically sensitive issues (Briones, 2011; Kornher and Kalkuhl, 2016).

90. Some other Regional Economic Communities in the world have already established regional strategic food reserves or are planning to. After the food price crisis in 2008, the Association of Southeast Asian Nations (ASEAN) established the ASEAN Plus Three Emergency Rice Reserve (APTEERR). The facility, aiming to provide humanitarian food relief for localized emergencies, builds on two previous regional facilities\(^\text{18}\) (Briones, 2011). Another example for a regional emergency reserve is the South Asian Association for Regional Cooperation (SAARC)\(^\text{19}\), which established the SAARC Food Security Reserve in 1987 (e.g., Pant, 2014). Discussions to establish other international food reserves have been held at the global level for years (FAO et al., 2011), as well as for the African continent, including for the SADC (see below), EAC (e.g., EAC, 2010), and ECOWAS regions (e.g., Kornher and Kalkuhl, 2016).

91. The idea of a regional strategic food reserve in Southern Africa has been discussed since the 1980s, however, despite various attempts, has never come to fruition. A regional facility was first suggested and discussed in the 1980s (Koester, 1986). The idea was revived in 2003 when the SADC Secretariat sought support from the World Bank to design a Regional Food Reserve Facility (RFRF). After initial country case studies were undertaken in Malawi, Tanzania and Zambia, an Extraordinary Summit on Agriculture and Food Security instructed the SADC Secretariat in May 2004 to consider the establishment of the RFRF. The Secretariat completed a study which was presented to countries in 2007\(^\text{20}\). In 2008 and 2009, workshops were held in each Member State, except for the Seychelles, to discuss the report and establishment of the facility. In 2014, documents on the SADC website indicate that the Secretariat had planned to commission another study to elaborate technical details on the establishment, operation and management of the facility (SADC, 2014c).

92. The SADC regional food reserve would aim both at improving food security and stabilizing prices. According to the SADC-commissioned study finalized in 2007, core components would be (i) physical reserves of 500,000 mt, equivalent to 3 months of consumption for the average number of countries, stocked in “Regional Reserve Centers” across the SADC region, to be realized within three years; (ii) a financial reserve; and (iii) a Food Reserve Management Information System (Zunckel, 2010 citing Takavarasha and Muchero, 2007; Rwelamira, 2009). The objectives pursued with this food reserve as per the last draft would include the stabilization of supply of food grains and the stabilization of producer prices by accumulating stocks in times of price weakness, and liquidating stock in times of price inflation (OECD, 2011). The total suggested budget amounts to US$118.8 million over three years, including stocking and operational cost (Rwelamira, 2009).

93. Key challenges include debate over objectives, governance and technical issues. Discussions about the establishment of the RFRF seem to have revolved around (i) the question

\(^{18}\) Previous schemes were the ASEAN Emergency Rice Reserve (AERR) established in 1979 and the East Asia Emergency Rice Reserve (EAERR) established in 2003.

\(^{19}\) This includes Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.

\(^{20}\) Given unavailability of this study, this note has only used secondary sources on the report.

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of whether a food reserve is conceptually an efficient way to manage price risk; (ii) uncertainty about whether the RFRF will operate efficiently and cost-effectively as a publicly managed entity, given previous experience at national levels in the region; (iii) worries that the establishment of the facility may result in unequal access to stock for different countries; (iv) concerns that the envisaged reserve size of 500,000 mt is too small—for example, the national reserve in South Africa alone stocks more than 1 million mt; and (v) recency bias: South Africa may have shown less interest to contribute to the facility given it has not experienced severe food shortages due to drought since 1994 (Rwelamira, 2009).

2.3.6 Regional World Bank innovation challenges

94. As part of the advisory services that the WBG provided to the SADC region, four innovation challenges were organized to identify the most relevant and innovative solutions to specific agriculture and food security risk financing problems. For these four innovation challenges, conducted in 2019 and 2020, private entities, NGOs, universities, or international organizations proposed new solutions to improve the financing of agriculture and food security risks in Southern African countries and their rural communities using available technology. The 2020 Challenge rewarded the three Winners and three Honorable mentions with public recognition as Top Innovators, training and coaching from World Bank mentors, as well as access to Draper University’s and InnMind’s entrepreneurship and finance programs.

95. Considering the 16 SADC Member States, the proposals were mostly centered in five recipient countries. The countries that were listed as potential implementation sites for the proposals included (in descending order) Zambia (labeled 27 times), South Africa (labeled 26 times), Malawi (labeled 25 times), Tanzania (labeled 22 times), and Mozambique (labeled 25 times). The reasons why these countries were prioritized in the proposals are numerous, including (i) the presence of ongoing projects, (ii) increased availability of information, and (iii) partnerships with local entities.

96. The majority of the proposals addressed four common issues for the SADC region. In total, 52 proposals were received from four continents. The four most addressed issues relate to i) the financing of agriculture and food security risks in the region, including high transaction costs for the rural population’s access to markets; ii) the problem of little and/or inadequate information on agriculture and food security risks for decision-making (including how lack of information on exposure and vulnerability data hampers the design of financial instruments to mitigate losses); or iii) exposure and value-at-risk data that are rarely linked to weather information systems.

97. The awarded proposals offer convincing solutions to the problems referred to above. By using modern technologies, these proposals focused on the development of systems for monitoring weather and production conditions and the creation of early warning systems, among others, to alert on the occurrence of meteorological events, and to enable the creation of instruments that help build the resilience of SADC Member States to hydrometeorological events, food insecurity and production failures.
3. Options to strengthen financial resilience against agriculture risks in Southern Africa

98. As agricultural financial risks faced by SADC often manifest themselves in a transboundary fashion, they require a regional response. Given expected governance, political, and financial challenges in establishing regional solutions, countries should first focus on strengthening national agriculture risk financing frameworks, supported by dedicated institutional arrangements. However, there are multiple benefits to considering risk management and risk financing solutions also at a regional level—the response can be better coordinated, and cost-effectiveness gains can be leveraged via economies of scale and risk pooling benefits. Knowledge sharing at the regional level can incentivize innovation, market creation for agricultural insurance schemes and disaster risk management policy alignment. Against this background, this note provides recommendations on risk financing options to undertake at the national and regional levels. Seven policy recommendations are provided for consideration by countries in the region and by the SADC Secretariat.

99. The recommendations in this note focus specifically on risk financing solutions but should be embedded in more comprehensive agricultural risk management frameworks. As further detailed out in section 2, other agricultural risk management approaches are equally critical to further build SADC members’ agriculture resilience against shocks and should, where appropriate, also be supported at the regional level.

3.1 National level

100. Recommendation 1: Strengthen existing national food and contingency reserves and budgetary systems. As identified in this note, many SADC Member States already have risk financing structures that were set up to deal with the financial impact of risks to agriculture, including national disaster funds and strategic food reserves. The first step is to strengthen and/or operationalize these existing structures. National disaster funds often face challenges, including (non-exhaustive): (i) lack of clear access rules and disbursement triggers; (ii) underfunding; and (iii) lack of clear rules regarding the use of funds. Institutional arrangements (dedicated institutions to manage such national funds supported by a dedicated legislative framework) will ensure the sustainability, scalability and flexibility of such financing mechanisms when disaster strikes. Strategic food reserves are likewise subject to recurrent challenges—for example, governments may use them to stabilize price volatility, although research has shown the significant shortcomings of this approach. Instead, food reserves should focus on providing food for emergency response. Countries should also consider establishing shock-responsive safety nets in the region as primary delivery channel to food-insecure households during agriculture emergencies—so far, only Madagascar and Malawi are institutionalizing this approach.

101. Recommendation 2: Build effective and suitable national agricultural insurance programs. Many countries in the region have experimented with agricultural insurance programs. These were often not tailored to the needs of smallholder farmers and ultimately failed to reach scale. Meanwhile, agricultural insurance holds the potential to shield farmers from the impacts of production risk. It can also serve as a risk-signaling instrument, indicating to farmers where the cultivation of certain crops is risky or favorable. International experience shows that successfully scaled-up agricultural insurance programs are built on public-private partnerships.
and some SADC Member States, including Zambia, Tanzania or South Africa, are already showing successful ways to realize this. Other countries also should consider possibilities to realize scaled-up national agricultural insurance programs. As a first step, they could conduct comprehensive agricultural insurance feasibility studies. The early efforts of Member States toward the development of markets for agricultural insurance schemes could also be supported by regional exchanges on successful schemes, and lessons learned from countries where such programs are more advanced.

102. **Recommendation 3: Consider expanding national protection against shocks through national disaster risk financing strategies with focus on the agriculture sector.** Countries should explore the idea of conducting standardized disaster risk financing diagnoses and agriculture risk assessment studies that would assess in a comparable way across the region the level of national fiscal exposure to selected agriculture risks, as well as the national state of financial preparedness to finance related costs. Using a risk layering approach, such analysis would then make recommendations on the optimal use of specific instruments to finance the identified financial risks most effectively. Building on such comprehensive assessments, a national disaster risk financing strategy could be established with a focus on the agriculture sector and the incorporation of further agriculture risk financing instruments. One possibility for countries to access further liquidity in the event of a shock could be the adoption of a contingent line of credit, such as the CAT DDO (WBG product), as part of said strategy. Countries should also consider joining regional risk pools, such as the African Risk Capacity (ARC). They may not immediately participate in the risk pool itself but becoming a member could be a risk-free way to get to know the instrument and their exposure.

3.2 **Regional level**

103. **Recommendation 4: Strengthen the mandate of SADC Secretariat on agriculture risk financing.** Located between SADC governments, the Secretariat has a natural role to play as a coordinator. It could issue regional policies advocating for and supporting the adoption of effective agriculture risk financing instruments. The current draft versions of the SADC Regional Resilience Strategic Framework 2019 and the SADC Disaster Risk Reduction Strategy and Action Plan 2020–2030 could serve as useful entry points in this regard. The Secretariat could also proactively manage expected agriculture emergencies, and by integrating the national agriculture risk assessments, could both develop standing regional contingency plans and coordinate the humanitarian response during regional emergencies. It could also help facilitate the harmonization of agriculture insurance regulation across the region to enable better risk sharing across countries and help existing and upcoming schemes to scale. The SADC Secretariat has already taken first steps in the direction of expanding its capacity and mandate to support the effective uptake of disaster risk financing solutions by countries in the region, latest by signing an MoU with the African Risk Capacity (ARC) in October 2019.

104. **Recommendation 5: Focus on strengthening technical capabilities on agriculture risk management.** The SADC Secretariat may consider focusing on capacity building for agriculture risk management both at the national level for Member States, but also at a regional level, through knowledge platforms or coalitions with technical expertise. Such technical platforms could support countries in the development of standardized and comparable risk profiles for agriculture-related shocks and generate additional analytics for the region. For example, developing a monitoring platform for weather events, price variations, the outbreak of pests and...
diseases for crops and livestock, food stocks, and populations at risk could enable more effective early warning systems across the region. Through knowledge platforms, the SADC Secretariat could also support countries to navigate DRF analytics and instruments and could for example host workshops and conferences, as well as provide one-on-one technical support. Finally, the SADC Secretariat could promote the sharing of best practice guidance and facilitate South-South knowledge exchanges on the elaboration of DRF strategies and policy and facilitate efforts across countries to collect and share agricultural data used for risk assessments and financial protection purposes.

105. **Recommendation 6: Regional strategic food reserve (SFR).** The concept of a regional SFR for the SADC region has been discussed among Member States for many years. The potential benefits are clear, including economies of scale and risk-sharing benefits, and the potential for a more coherent and cost-effective management of regional food crises. However, the idea has not been realized given lack of Member States’ agreement on crucial questions such as governance, access rules, and contributions. In the light of the latest food crisis due to unfavorable weather conditions since the 2015/16 agricultural season and the potentially looming compounding effect of COVID-19, there might be an opportunity in crisis to revive the idea. One approach could also be to seek support from an international donor to fund seed capital and thus provide momentum for institutional structures to be put in place.

106. **Recommendation 7: Explore agriculture risk financing instruments at the regional level.** SADC Member States may consider applying agriculture risk financing solutions at the regional level. As a first step, a regional disaster risk financing diagnosis could be carried out by the SADC Secretariat, analyzing the regional financial and economic exposure to agriculture risks and the state of financial preparedness of Member States. It would then develop recommendations on how to improve the overall regional state of financial preparedness. Building on such analysis, regional agriculture risk financing instruments could be considered. For example, one option could be that SADC country governments enter into a regional contingent credit agreement with a multilateral development bank, which would provide liquidity to a regional response in case of a shock. For such a solution, governance and access questions would have to be dealt with carefully, so as not to create unwanted competition for resources. Instead, it should be structured such that individual countries draw down resources quickly and only when needed. Concerning regional risk transfer options, risk pools can benefit small member countries that share similar characteristics in terms of vulnerability to particular shocks or a similar segmentation of commercial and smallholder farmers.
4. References


