



## Economic insights

### Crop insurance: offering a way to support food security

#### Key takeaways

- Food price inflation reached 41% in May 2021 and 34% in March 2022, driven by supply shocks.
- Crop insurance is an effective risk management tool to reduce price volatility and support food security.
- We estimate that about 60% of insurable crops globally were unprotected by insurance in 2022.
- Crop insurance resilience is typically higher in sample countries that have higher public spend on agriculture vs the sector's GDP contribution.
- Public-private partnerships with both insurance and state support can maximise benefits to farmers.

#### About Economic Insights

Analysis of key economic developments and their implications for the global re/insurance industry.

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#### In a nutshell

Food price inflation of more than 20% for much of the past two years highlights the need to make crop supply more resilient. We estimate that about 60% insurable crop production globally was unprotected as of 2022, a USD 113 billion crop protection gap. Countries with higher crop insurance resilience typically also have a bigger government focus on agriculture. This public and private support for crop insurance is associated with lower food insecurity and suggests combined efforts boost crop resilience.

The past two years have highlighted the importance of making the world's crop sector more resilient. In May 2021, global food inflation spiked to 41% due to supply chain disruptions in the COVID-19 pandemic, the FAO's monthly Food Price Index shows. Food inflation stayed above 20% throughout 2021 and peaked again to 34% in March 2022 after Russia invaded Ukraine.<sup>1</sup> Though the price index has declined in recent months, the lags in cost transmission mechanisms mean the shock is still being felt along the value chain, including continued high food retail inflation and distribution costs.<sup>2</sup> Weather disasters have also reduced yields of staple crops in many parts of the world. A severe drought in Brazil, the world's second-largest soybean exporter, led to an 18% soybean crop decline in 2021, for example. Food supply and price shocks tend to exacerbate poverty and reduce nutrition, leading to food insecurity and hunger, especially in low- and middle-income countries. Severe food insecurity could affect more than 345 million people in 2023, double the 2020 level, the World Food Programme estimates.<sup>3</sup>

To curb the impact of high food prices domestically, governments often resort to targeted interventions such as trade policies, cash and in-kind transfers and risk management tools.<sup>4</sup> Crop insurance is an effective risk management tool that can reduce price volatility, stabilise income for farmers, improve resilience against weather hazards, and ease access to agricultural finance, as shown by studies focusing on major food producers such as China and the US.<sup>5</sup> Our SRI Crop Insurance Resilience Index (Crop I-RI) seeks to measure the value of crop insurance coverage.<sup>6</sup> The index measures the share of global insurable crop production that is insured against shock events.<sup>7</sup> Crop resilience globally is rising, reaching 40.8% in 2022 from 27.7% in 2016, suggesting a healthy

<sup>1</sup> Calculations based on FAO Food Price Index data.

<sup>2</sup> *Retail Food Price Inflation Still High Despite Falling Input Costs* (fitchratings.com)

<sup>3</sup> *A global food crisis-2023: Another year of extreme jeopardy for those struggling to feed their families*, World Food Programme, 2023.

<sup>4</sup> *Food Price Shocks: Channels and Implications*, World Bank, April 2019.

<sup>5</sup> H. Wang et. al, "Agricultural Insurance, Climate Change, and Food Security: Evidence from Chinese Farmers", Sustainability, 2 August 2022.

<sup>6</sup> *The Vital Role of Crop Insurance: Protecting Farmers, Ensuring Food Security, and Strengthening Rural Economies* (insurancejournal.com)

<sup>7</sup> *sigma 2/2023 – Restoring resilience*, Swiss Re Institute, 21 June 2023.

<sup>8</sup> "Crops" refers to all food crops grown in a country, such as cereals, fruits, vegetables, roots and tubers, sugar crops, oilseeds. "Shock events" include extreme weather events and accidents (eg. fire, disease, insect swarms).

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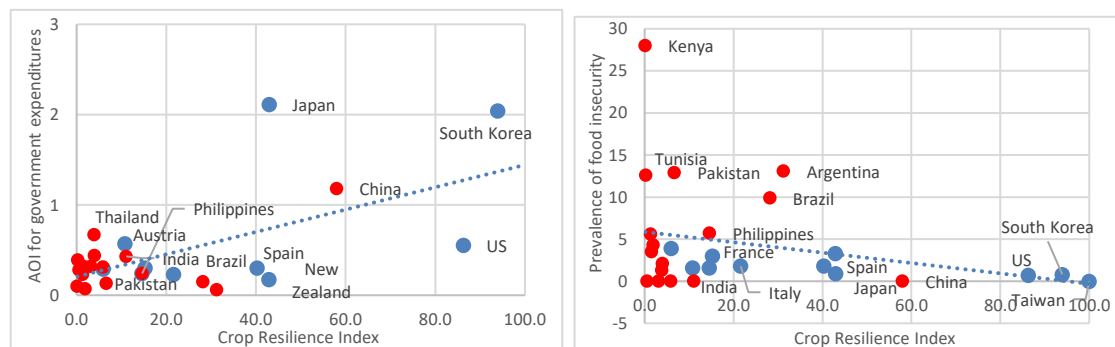
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expansion of crop production protected by insurance coverage. Still, about 60% is still unprotected, and we estimate the protection gap at USD 113 billion globally in premium equivalent terms in 2022.

**Figure 1**

Left: Agriculture orientation index (AOI) for government expenditure vs Crop I-RI, 2021

Right: Prevalence of food insecurity vs Crop I-RI, 2021



Note: Red dots denote emerging markets and blue dots denote advanced markets.  
Source: FAOStat, Swiss Re Institute

Crop I-RI and protection gaps vary significantly by country. Typically, countries in our sample with higher government orientation to agriculture (ie, relatively higher public expenditure on the agriculture sector in comparison to the sector's contribution to its GDP) have higher crop resilience values (see Figure 1, left).<sup>8</sup> These markets usually have less food insecurity (see Figure 1, right). This is because crop production typically has components of systemic risks and information asymmetries, adverse selection and moral hazards, that can only be diversified or reduced through public-private partnership (PPP).<sup>9</sup>

Government support motivates both insurers and insureds to engage in crop insurance initiatives. In turn, with higher private involvement in crop insurance, governments' fiscal burden can also reduce. In major crop producers with high gains in resilience, such as China and Brazil, growth in insurance coverage has been significant (16% and 9% per year, respectively), supported by high premium subsidies from the government (nearly 80% in some cases) and more PPPs in crop insurance. By region, emerging Asia achieved the highest resilience gain of 202bps to 47% in 2022, attributed to a mix of government support, the expansion and involvement of private agriculture insurance providers, and the introduction of parametric insurance products such as Weather Index Based Insurance.<sup>10</sup>

<sup>8</sup> Fig 1 left shows the Agriculture Orientation Index (AOI) for government expenditure. This measures government spending on agriculture relative to its contribution in the GDP. It is defined as:  $AOI = \frac{\text{Agriculture Share of gov't expenditures}}{\text{Agriculture value added Share of GDP}}$ . An AOI higher than 1 reflects higher spend vs GDP contribution.

<sup>9</sup> *Government Support to Agricultural Insurance*, World Bank, 2010.

<sup>10</sup> *Climate Change and Agricultural Insurance in the Asia and the Pacific Region, Asian Development Outlook 2021 Update*, Asian Development Bank.

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