

Emerging Risk Report - 2015
Innovation Series

SOCIETY & SECURITY

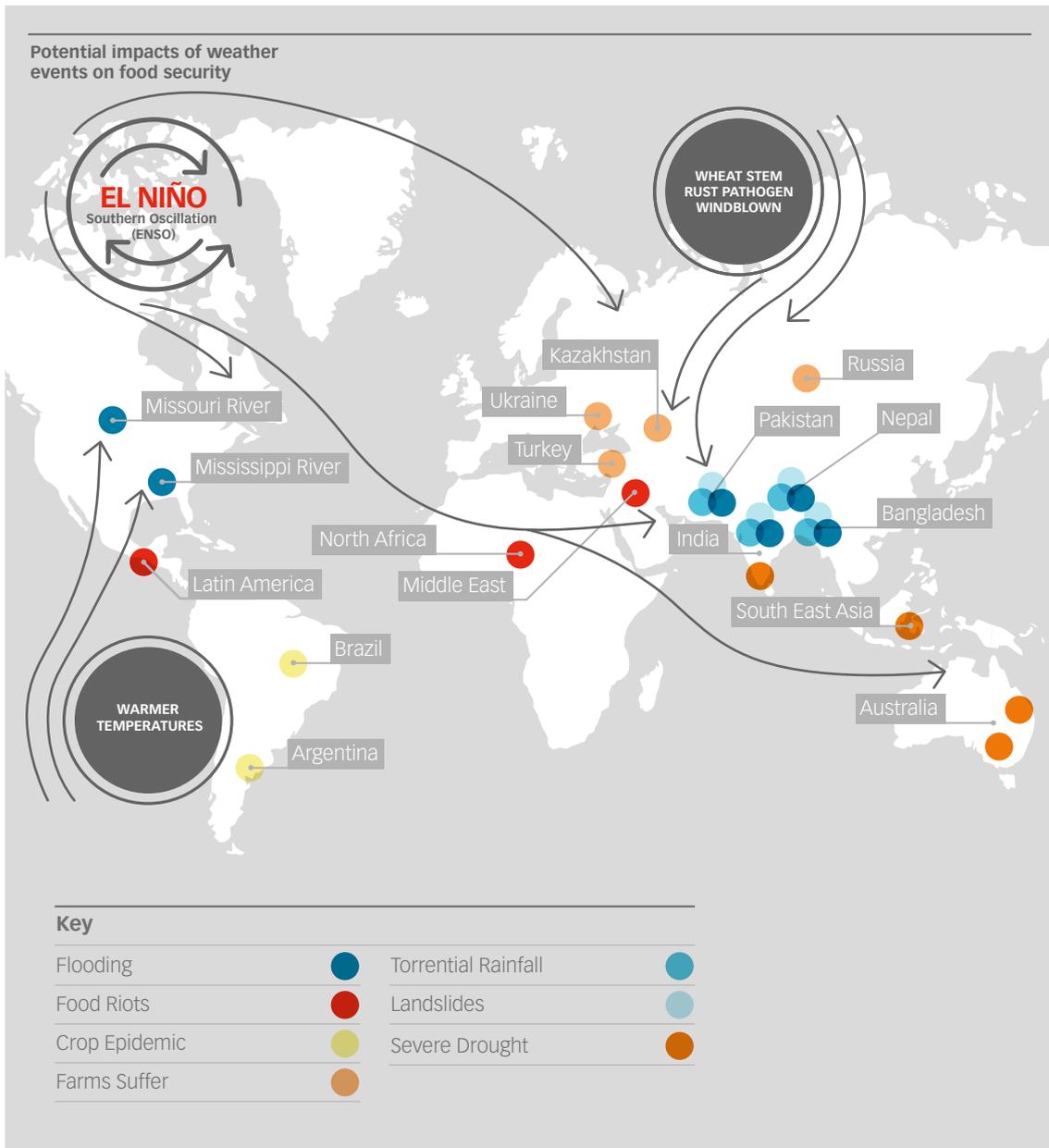
Food System Shock

Executive Summary

*The insurance impacts
of acute disruption to
global food supply*

Food System Shock

The insurance impacts of acute disruption to global food supply



Overall global economic impact:



“Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food.”

United Nations Food and Agricultural Organisation, 1995

One billion people go hungry every year, a figure that could treble by 2050.¹ Closing the gap between production and supply is an essential component of food security, and one Lloyd’s focused on in its 2013 report, *Feast or Famine*.

However, food security has another dimension that has so far been ignored: the vulnerability of the interconnected and overstretched global food system to sudden systemic shocks, such as catastrophic weather events or plant pandemics – many of which are exacerbated by climate change.

Significant disruption to any of the world’s major food production areas would have devastating impacts on businesses and communities around the world, and yet food security remains poorly understood.

Models used by insurers to assess their ability to pay claims against catastrophic events have traditionally focused solely on the direct physical impacts and financial losses that may arise as a result.

However, the scenario presented in the Food System Shock report goes further by looking at the additional complex and far-reaching economic and humanitarian consequences that these direct physical and financial impacts could trigger.

Key findings

- A combination of just three catastrophic weather events could undermine food production across the globe.
- These could lead to a 10% drop in global maize production, an 11% fall in soybean production, a 7% fall in wheat production and a 7% fall in rice production.
- Wheat, maize and soybean prices could increase to quadruple the average levels experienced during the 20 years prior to the global food price shock of 2007/8. Rice prices could increase by 500%.
- The scenario indicates this series of events has the potential to lead to food riots breaking out in urban areas across the Middle East, North Africa and Latin America, leading to wider political instability and having knock-on effects for a wide range of businesses.

- While agriculture commodity stocks might benefit, the overall economic impact of high food prices, combined with rising political instability, could severely impact financial markets. The scenario indicates that the main European stock markets might lose 10% of their value and US stock markets 5%.

Implications for insurers

- A systemic shock to global food supply could trigger significant claims across multiple classes of insurance, including (but not limited to) terrorism and political violence, political risk, business interruption, marine and aviation, agriculture, product liability and recall, and environmental liability.
- These losses could be compounded by the potential for food system shock to generate losses that span multiple years. The ability of insurers to pay claims quickly would be an important factor in post-shock recovery.
- More broadly, the insurance industry would also be affected by impacts on investment income and the global regulatory and business environment.
- The insurance industry is in a position to make an important contribution to improving the resilience and sustainability of the global food system, by encouraging businesses to think about their exposure to risks throughout the food supply chain, and by providing innovative risk transfer products to enhance global resilience to systemic food system shocks.
- Insurers also need to work with researchers to develop models capable of capturing not only the physical effects of extreme events but also their various economic and social impacts. This is the next step needed to develop insurers’ understanding of complex risks.

¹ UN, 2015. *Food security and sustainable agriculture [online]*. Available from: <http://www.un.org/en/sustainablefuture/food.asp>

About the report

Lloyd's produced this report to help underwriters operating in the Lloyd's market identify these previously unconsidered food security impacts on insurance and risk.

The scenario described in this report is relevant to stress and scenario testing required under the Solvency II framework: it represents a class of events with a probability thought to be well within the benchmark return period of 1:200 years against which insurers must be resilient.

Scenarios are not predictions; they explore what might happen based on past events and scientific, social and economic theory. In a world of emerging risk, it is not possible to achieve certainty regarding the nature and scale of threats faced by insurers – as such the insurance industry must be resilient to uncertainty.

Lloyd's developed the scenario and its likely impacts with researchers from Anglia Ruskin University, the University of Wisconsin-Madison and Oak Ridge National Laboratory, in conjunction with members of the UK/US Task Force on Resilience of the Global Food Supply Chain to Extreme Events, supported by the UK Foreign and Commonwealth Office.

The full report can be downloaded at www.lloyds.com/foodsystemshock

Case study: the impacts of food system shock on coffee production in Central America

In 2013, a deadly rust disease caused by the *Hemileia vasatrix* fungus swept across coffee plantations in Central America, affecting over half of the total area of plantations in the region and generating losses of almost \$500 million.²

It is estimated that the spread of this disease came at the cost of 374,000 jobs, as labourers usually employed to harvest the crop were not needed. The social impact of the shock to coffee production was particularly significant, as most coffee in Central America is grown by smallholders who struggle to afford fungicides and absorb the financial losses linked to reduced yield.

As with the pathogens in the food shock scenario in the report, the spread of coffee leaf rust was exacerbated by climate change.³

First, due to higher temperatures widening the geographical footprint of areas hospitable to the rust, and second, due to the increased frequency of El Niño events (for which there is an established link between rising frequency and climate change)⁴ shortening the pathogen's latent period, thus reducing the time taken for plants to be killed by the disease.

About Lloyd's

Over the past 327 years, Lloyd's has built an unrivalled international reputation for innovation and underwriting expertise insuring risks from the Titanic to the World Trade Center.

Our expert underwriters work with local brokers across the world to create innovative insurance products for entrepreneurs and business leaders.

Today, the Lloyd's market continues to insure some of the world's largest and most complex risks, operating in more than 200 countries and territories.

² International Coffee Organization, 2013. Report on the outbreak of coffee leaf rust in Central America and Action Plan to combat the pest [online]. Available from: <http://dev.ico.org/documents/cy2012-13/ed-2157e-report-clr.pdf>

³ Feed the Future, 2013. Fighting coffee rust in Latin America and the Caribbean [online]. Available from: <http://feedthefuture.gov/article/fighting-coffee-rust-latin-america-and-caribbean>

⁴ Cai, W. et al., 2014. Increasing frequency of extreme El Niño events due to greenhouse warming [online]. Available from: <http://www.nature.com/nclimate/journal/v4/n2/full/nclimate2100.html>