



## Farmers in Crisis

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*It is a perilous time to be a farmer. Across the world, 2015 broke records for unseasonal, unprecedented, and unexpected weather. The combination of El Niño and climate change produced conditions with devastating effects for the agriculture sector around the globe. This article examines the impacts of unseasonal weather on farmers around the world, in losses to yield quality and quantity but also in economic, physical and psychological effects for farmers coping with the “new normal” in weather. It considers regional differences in farmers’ susceptibility to unseasonal weather, and presents the implications of the lack of resiliency of the major crop producers for the future of food security, and by extension, political stability. Finally, it looks at how the international community is addressing this situation, concluding with practical and achievable means for farmers and cooperatives to start to build resiliency to climate change today.*

### Farmers around the world experience significant losses from extreme weather

It is the prize that the world did not want to see given. Nonetheless, 2015 proved to have no limit to its unseasonal and unprecedented weather. Based largely on a combination of a strong El Niño and human-induced global warming, global average surface temperatures exceeded all previous on record to reach the symbolic and significant milestone of 1 °C above the pre-industrial era.

Alongside the rise in unseasonable weather, extreme weather events are now considered to be the “new normal”, with the World Meteorological Organisation listing the global climate at an unprecedented susceptibility to climate change-induced extreme weather. The list makes for painful reading: major heatwaves (eg. average maximum temperatures exceeded 42 °C India, May-June), high rainfall leading to unprecedented flooding (eg. northern UK this winter), drought (eg. dry and warm conditions across much of the western USA led to wildfires, including a record of 400 fires burning 728,000 hectares across Alaska in May) and tropical cyclones (eg. Hurricane Patricia, Mexico 24 October, was the strongest hurricane on record in the Atlantic or eastern North Pacific basins, with maximum sustained wind speeds of 320 km/hour), to name a few.<sup>[1]</sup> [www.wmo.int/media/content/wmo-2015-likely-be-warmest-record-2011-2015-warmest-five-yea\nr-period](http://www.wmo.int/media/content/wmo-2015-likely-be-warmest-record-2011-2015-warmest-five-yea\nr-period)

The implications for farmers around the world has been diverse. In Alberta, Canada, for instance, the

provincial government has declared the drought experienced in the spring and summer, which affected about 80% of the province's farmers and reduced the year's harvest by 25% below the five-year average, to constitute a "disaster", a designation that allows farmers to access further compensation.<sup>[2]</sup>[www.cbc.ca/news/canada/calgary/agriculture-disaster-declared-in-alberta-after-losses-from-extreme-weather-1.3200420](http://www.cbc.ca/news/canada/calgary/agriculture-disaster-declared-in-alberta-after-losses-from-extreme-weather-1.3200420) Similarly, in Central America, the region's main harvest saw a decline of as much as 60% of maize and 80% of beans due to prolonged dry weather, resulting in the governments of El Salvador, Guatemala, Honduras and Nicaragua to distribute agricultural aid packages to assist farmers try to recover in subsequent plantings, and distributing direct food aid to help families cope with severe food shortages.<sup>[3]</sup>[www.fao.org/news/story/en/item/328614/icode/](http://www.fao.org/news/story/en/item/328614/icode/)

In some areas of Europe, farmers experienced the reverse; a cold, wet summer led to an increase in pests and diseases, slower ripening of crops, poor quality produce and low yields across Northern UK, coupled with depressed global market prices.<sup>[4]</sup>[www.scotsman.com/news/environment/crisis-looming-for-scottish-cereal-farmers-1-3878956](http://www.scotsman.com/news/environment/crisis-looming-for-scottish-cereal-farmers-1-3878956) In France, the temperate winter conditions that saw 2015 close have led fruit trees to bloom a second time, a harmful phenomenon that depletes and weakens the trees, making them more susceptible to pests and diseases.<sup>[5]</sup>[www.franceinfo.fr/emission/jardin/2015-2016/jardin-2015-2016-du-29-11-2015-29-11-2015-n05-05](http://www.franceinfo.fr/emission/jardin/2015-2016/jardin-2015-2016-du-29-11-2015-29-11-2015-n05-05) Similarly, India saw a host of extreme weather conditions throughout the year, which saw a prolonged dry season with sporadic temperatures turn to storms of hail, rain and winds hitting various regions across the country. The country's staple crop, onions, has increased in price by up to 40%, 2,035 farmers leave the agriculture sector every day, and suicides among farmers attempting to sustain a livelihood in the beleaguered conditions extreme weather is imposing are becoming an epidemic.<sup>[6]</sup>[www.aljazeera.com/indepth/features/2014/04/suicides-add-farmers-misery-india-201441982n733794879.html](http://www.aljazeera.com/indepth/features/2014/04/suicides-add-farmers-misery-india-201441982n733794879.html)

The accumulation of years of increasing unseasonal weather and extreme weather events has had a significant impact across the world for farmers. Examining the crop production of cereals alone in the last 40 years, droughts and heat waves have contributed to a 10% reduction in global production.<sup>[7]</sup>[news.vice.com/article/extreme-weather-wiped-out-a-tenth-of-the-worlds-cereal-production](http://news.vice.com/article/extreme-weather-wiped-out-a-tenth-of-the-worlds-cereal-production) This is not unexpected when considering the findings of 'Meteo Protect' white paper, "The Impact of Climate Variability on the Private Sector: Reconciling Business and Climate Change Horizons", which demonstrated that the cost of weather variability is very material already and that weather variability has dramatically risen over the last decade and is set to continue to rise. It shows that many economic sectors are already affected by adverse unseasonal weather, but agriculture is amongst the ones that is affected most and for which operational and financial solutions need to be implemented on an urgent basis.

#### **Agricultural operations in North America and Europe under particular threat**

In a startling find, researchers at the University of British Columbia found that the effects of droughts resulting from climate change will have a significantly greater impact on farms in developed countries, including North America, Europe and Australia, than those in less-developed countries. In fact, developed countries experience 8-11% more damage than developing countries. Just as shockingly, the impact of these extreme weather events is taking a greater toll than ever before, with recent droughts causing approximately 7% more production damage (decreased harvest area and yields) than droughts of the past.<sup>[8]</sup>[www.nature.com/nature/journal/v529/n7584/full/nature16467.html](http://www.nature.com/nature/journal/v529/n7584/full/nature16467.html)

Having correlated the United Nations' Food and Agriculture Organization crop data for 16 cereal crops from 177 countries for the period 1964-2007 with 2,800 extreme weather events (heat waves, droughts, cold snaps and floods), researchers found that the most dangerous extreme weather event for cereals production has been droughts. However, the effects of droughts were discriminate, cutting yields of farmers in developed countries by almost 20%, whereas a farmer in Asia may be expected to see a decrease in productivity of approximately 12%, a farmer in Africa 9%, and a farmer in Latin America seeing no significant impact at all from a drought.<sup>[9]</sup>[www.cbc.ca/news/technology/drought-climate-change-1.3393311](http://www.cbc.ca/news/technology/drought-climate-change-1.3393311)

How is it that a drought can impact a farmer in one region of the world so significantly, while leaving another untouched? Researchers speculate that the reason may be differences in the nature of the agriculture industry between regions. In fact, it may be that the developed countries are a victim of their own success. Their large, intensively cultivated fields dedicated to the growth of one crop across large swaths of land, are less resilient to the unpredictable conditions being wrought by climate change, than the smaller and more diverse fields of the developing world. Whereas the latter experience lower yields, they remain less susceptible to the consequences of weather variability.<sup>[10]</sup>[www.cbc.ca/news/technology/drought-climate-change-1.3393311](http://www.cbc.ca/news/technology/drought-climate-change-1.3393311)

The implications of the lack of resiliency of the major crop producers are as diverse as they are immediate. Over the past eight years, droughts in Australia, the Canadian Prairies, the US, and Russia, have contributed to major price hikes for wheat, rice and corn. As these main cereal crops supply approximately 50% of the world's calories, the political implications of their rising prices formidable.

They have been linked to riots and political instability in Egypt, Haiti, and Bangladesh; export bans in Japan, Brazil, India and Vietnam; and consumer shortages of rice in Vancouver, Canada.<sup>[11]</sup> [www.vancouversun.com/business/extreme+weather+hits+western+farmers+harder+than+anywhere+else+world+study+finds/1](http://www.vancouversun.com/business/extreme+weather+hits+western+farmers+harder+than+anywhere+else+world+study+finds/1)

#### **Farmers demand help in building resiliency to unseasonal and extreme weather**

At the recent Cop21 climate change conference hosted by the United Nations in Paris in December, farmers sought to have a voice in demanding that world leaders consider long-term, ongoing political commitment to finding solutions to climate change and the unseasonal weather conditions it brings. Farmers have made it clear that these are essential if we are to recover from the immediate effects of climate change and build resiliency into farming systems in order to endure weather shocks.

Certainly, agriculture is at the heart of the climate change discourse, by not only impacting the livelihoods of millions of farmers and affecting global food security, but also as a result of agriculture accounting for 24% of the greenhouse gas emissions which cause climate change. The Food and Agriculture Organization (FAO) of the United Nations hosted a series of special events featured on the effects of climate change on the agriculture industry, including, for instance, an "Agriculture Action Day", showcasing existing solutions for transitioning to climate-resilient, low-greenhouse-gas agriculture, and Resilience Action Day, for which FAO Director-General José Graziano da Silva spoke on damages and losses to agriculture due to climate change and the need to build the resilience to climate shocks of poor and vulnerable small-scale farmers on the front lines of climate disasters.

In keeping with the findings of the research that large-scale mono-culture intensive farming operations favoured by developed countries are particularly susceptible to climate change, David Nabarro, the UN Secretary General's special representative for food security and nutrition, outlined the huge potential for agriculture to be a solution for climate change, by reshaping agriculture to be more climate change resilient and low-carbon based. He explained, "The time has come to reshape agriculture but it must be of the right type: regenerative, smallholder-centered, focused on food loss and waste, adaptation, soils management, oceans and livestock."<sup>[12]</sup> [newsroom.unfccc.int/lpaa/agriculture/press-release-lpaa-focus-agriculture-at-cop21/](http://newsroom.unfccc.int/lpaa/agriculture/press-release-lpaa-focus-agriculture-at-cop21/)

Indeed, research by the FAO taking stock of climate change impacts on food and agriculture at global and regional levels over the past two decades has found that adaptation to climate change has spontaneously led to autonomous adaptations to be taken by farmers around the world, without new technology or climate-smart policy incentives (eg. modifying sowing and harvesting times, crop types, labour management practices). At the same time, opportunities exist for larger scale adaptation, taking into account new agrotechnologies (eg. the development of heat-tolerant crop varieties, installation of post-harvest storage facilities for a warmer climate) and national and international policy changes (eg. social protection for nutrition).<sup>[13]</sup> Wheeler, T. 2015. Climate change impacts on food systems and implications for climate-compatible food policies, In: Climate change and food systems: global assessments and implications for food security and trade, Aziz Elbehri (editor). Food Agriculture Organization of the United Nations (FAO), Rome, 2015.

#### **Making farms and farming cooperatives weather neutral**

In order to be proactive as they and the agriculture sector will have to rethink their ways of doing business and implement long-term institutional changes, agriculturalists have the opportunity to use weather derivatives to protect their financial performance against the effect of adverse weather. In this way, farmers can be proactive, anticipating future risks and hedging against them while climate change adaptation and mitigation strategies are employed.

Meteo Protect, Europe's leader in weather risk management, can provide both weather risk assessments and financial analyses to farmers, as well as the ability to decide how and to what degree they may wish to decrease their weather risk exposure.

This means offering covers that compensate the producer automatically (with no field loss assessment or adjustment) when the weather index crosses a predefined threshold (eg. in mm rain, degrees Celsius temperature, m/hour wind, or even crop yield, quality or price). Meteo Protect offers a variety of packaged solutions, such as for spring frost at planting, drought mid-season, heavy rains at harvest, but also makes available customized hedging solutions unique to the needs of the farmer, based on specific parameters (analyzing geo-location, risk period, weather parameter and value insured), linked to a client's risk profile.

Certainly, existing traditional solutions no longer apply. Meteo Protect is aware that each plant, each field is different. Not everybody plants the same day, nor uses the same fertilizers and pesticides. Weather risk is local and specific. However, Meteo Protect knows exactly how weather affects each and every plant, so it can provide farmers access to specific and targeted financial solutions for the specific perils they are seeking protection for, at the price that reflects individual risks and operations.

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