Warnings from the past: climate change could cause food crisis

Large investments in adaptation to climate change are required if we are to avoid a global food crisis caused by heat stress and crop failure. Researchers say historical examples of heat waves prove that rising temperatures will compromise food security.

In the summer of 2003, heat waves in Western Europe resulted in more than 50,000 deaths and had widespread impacts on agriculture and food prices. For example, the temperature in France during this summer was 3.5°C above average. In the future, this unusually hot summer may become the norm. This study predicts that average summer temperatures could reach this level before the end of the century, based on analyses of data from 23 global climate change models.

In hotter countries, where many more people depend on agriculture for their livelihoods, the effects will be more profound. Such dramatic increases in temperature could severely compromise global food security and human health, unless adaptive measures are implemented.

The study suggests that by 2100, average temperatures during growing season in the tropics and sub-tropics are very likely to surpass the most extreme temperatures recorded in these areas during the last century. Temperatures in Europe are also likely to exceed those of the hottest summers on record. The researchers used data from 23 climate models to make these predictions with a high degree of certainty (90 per cent). They stress the need for governments to prioritise research and development in climate change adaptation for agriculture.

Using historical examples of heat waves and associated food shortages, the researchers illustrate the effects of temperature on food security. In the 2003 example, increased temperatures resulted in poor yields from grain and fruit crops in France and Italy, although a major food crisis was averted. In areas of North Africa, however, droughts between the 1960s and 1990s had a large impact on agriculture, causing many hunger-related deaths. Without significant adaptation, further temperature increases over the coming century are likely to reduce yields of major crops by 20-40 per cent and could cripple the region’s economy, which relies on food production, and force those employed in agriculture to migrate or flee from the region as refugees.

Local food shortages can destabilise global security, because countries may respond by placing restrictions on exports or trying to purchase large amounts of grain from other nations. The authors say it will be extremely difficult to balance food deficits and surpluses in different parts of the word unless appropriate adaptive investments are made without delay. Large investments in genomics, breeding, management and engineering are needed to develop heat and drought tolerant crop varieties and new irrigation systems. In recent years, there has been a downwards trend in national and international investments in agriculture, despite the clear risks posed to food security by climate change.


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