



# The dual threat of extreme weather and the COVID-19 crisis: Anticipating the impacts on food availability

The COVID-19 pandemic is having a profound effect on the global economy and is jeopardizing the livelihoods and food security of millions of people. In June 2020, the World Bank released its outlook on the global economy, estimating a contraction of 5.2 percent and the deepest global recession in decades (World Bank, 2020). The effects of this global recession on agri-food production, consumption and trade are likely to be adverse.

The global recession is occurring in the context of a rapidly changing climate. This year is expected to be the second hottest in recorded history. Weather forecasts for 2020 indicate a high probability that extreme weather will adversely affect food production in many countries. Anticipating how extreme weather events may affect food availability in the context of a severely weakened global economy, and where the risks posed by this dual threat are greatest, is important for taking proactive steps to reduce these risks.

This brief draws on historical evidence and demonstrates that reductions in national food availability caused by severe weather events tend to be considerably larger in magnitude when they occur during global economic downturns. The risks posed by this dual threat are particularly high for poorer countries that are net food importers. Taking actions to mitigate these adverse effects in the short-term, while building the resilience of agri-food systems to future shocks is critical for avoiding major contractions in food availability and associated risks of food insecurity.

## **THE COVID-19 PANDEMIC POSES A RANGE OF RISKS TO FOOD AVAILABILITY AND ACCESS**

The COVID-19 pandemic creates a host of challenges in terms of food production and demand, which can adversely affect food availability in some countries. On the supply side, the COVID-19 outbreak and containment effort measures, such as physical distancing, have led to disruptions in production, processing and marketing of food items, leading to increased food price volatility and stock-outs of some food items. Disruptions in food systems may lead to a loss of 451 million (or 30 percent) of jobs in food systems globally (ILO, 2020).

The livelihoods of roughly 1 billion people have been put at risk by COVID-19 (ILO, 2020). Job losses and reductions in income may reduce global demand for some food items. More importantly, the loss of livelihoods severely affects the capacity of vulnerable households to access the food they need. The Food and Agriculture Organization of the United Nations (FAO) has projected that, globally, reductions in gross domestic product (GDP) due to the COVID-19 crisis could increase the number of undernourished people in net importer countries by between 14.4 to 80.3 million (FAO, 2020a). These scenarios are being revised as new information emerges.

Net food-importing countries face some of the greatest challenges in the context of the COVID-19 crisis for several reasons. On the one hand, these countries depend on revenue and foreign exchange earnings from exports, which are reduced due to contractions in global economic activities and demand. On the other hand, they face considerably more volatile and unstable market conditions for food imports. The combination of these factors can lead to reductions in local food availability, particularly in poorer net food-importing countries.

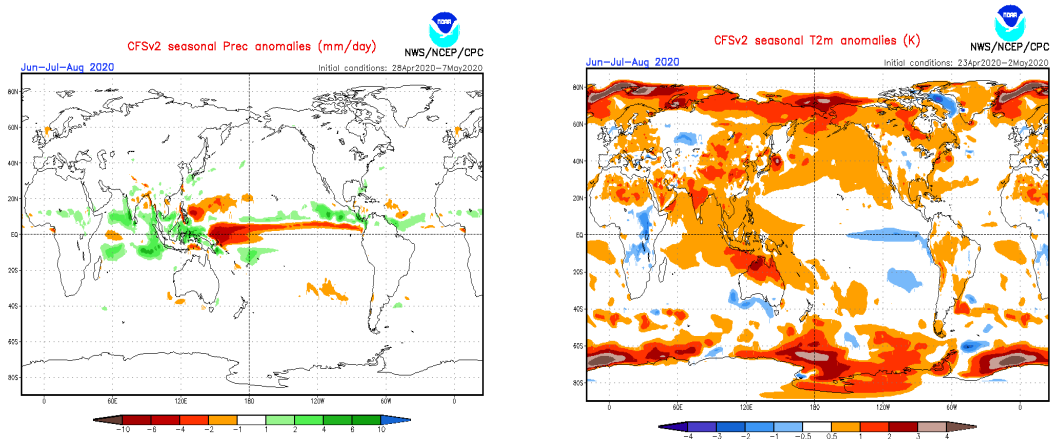
### THE GLOBAL WEATHER FORECAST FOR 2020 HIGHLIGHTS SEVERAL KEY RISKS

While the global economy and agri-food systems throughout the world have been weakened by the COVID-19 crisis, an unstable and rapidly changing global climate poses additional risks. The first months of 2020 were some of the hottest on record, and anomalously high temperatures are forecasted to persist in many parts of the world in the months to come. Alongside high temperatures, severe weather events are forecasted for many parts of the world (WMO, 2020). In the Atlantic basin, conditions are right for a very active hurricane season. Countries in Central America and the Caribbean region may experience between 15 and 24 named tropical storms this year. The global forecasts for anomalous temperatures and precipitations (Figure 1) predict above-normal precipitations in Australia, the western portion of Indonesian Archipelago, and Eastern and Horn of Africa regions. Heavy rainfall is likely to contribute to further spread of desert locusts currently active in parts of Africa, with serious consequences for food production and food security.

At the same time, in several regions of Latin America, the climatological signals indicate that low rainfall conditions will prevail in the rainy seasons between June and October. Below normal rainfalls have already been reported in Brazil's Mato Grosso do Sul, São Paulo and Paraná states. Parts of Argentina, Chile, Colombia and the Bolivarian Republic of Venezuela are also experiencing unusually dry weather. The dry conditions in Latin America are likely to lead to extended periods of drought and severe wildfires, which will affect agricultural production and food supplies.

Under these conditions, it is not a question of whether or not a large-scale natural disaster will occur during the COVID-19 global crisis, but rather, when and where such disasters will occur, and how they will affect food availability given current global economic conditions.

FIGURE 1 | Forecasts for anomalous temperatures and precipitations for June to August 2020



Source: National Weather Service Climate Prediction Centre, Seasonal Forecast.

## **HOW THE EFFECTS OF SEVERE WEATHER EVENTS ON FOOD AVAILABILITY AND ACCESS ARE MAGNIFIED IN THE CONTEXT OF THE GLOBAL ECONOMIC DOWNTURN**

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Weather disasters have a direct effect on food supplies. When they occur in major global exporting regions, weather-induced supply side disruptions can lead to increases in global food prices, adversely affecting consumers worldwide. For example, weather conditions in the Midwest of the United States of America often determine global maize prices. In poorer countries, particularly those with a high concentration of agriculture-dependent people, weather shocks can affect both food supply and demand, with important implications for food security. In other cases, countries, such as the Small Island Developing States (SIDS) might be particularly exposed to this shock, since a large part of their already indebted economies relies on the foreign currency from activities that have been extremely damaged by the worldwide lockdown, such as tourism. Weather shocks not only undermine local food availability through impacts on production, but they also constrain food access and demand through reductions in incomes of agricultural workers and farmers.

Global economic crises, like the one induced by the COVID-19 pandemic, have large effects on the demand for agri-food products. Although overall food demand is quite inelastic, there are significant variations in demand elasticity across different food groups. As people's incomes and savings are eroded during an economic crisis, high value, and often highly nutritious foods, such as fruit, vegetables, and protein-rich products, are often replaced with lower value foods, such as those derived from staple cereals (FAO, 2020b). Markets for other high value agricultural products, such as coffee, tea and chocolate, as well as fibres (wool and cotton), are also sensitive to demand drops brought about by economic downturn.

The effects of global economic crises on demand for high value agricultural products pose major risks to countries that specialize in their production. In some African and Central American countries, the export of high value agricultural commodities accounts for 25 percent, or more, of all foreign exchange earnings (Bruinsma, 2003). These countries are often net-food importers. When global demand for these products drops, it not only affects the incomes and livelihoods of farmers, but also the demand shock spreads throughout the entire economy. This leads to reductions in people's ability to purchase food, and by eroding foreign exchange earnings, can make it more difficult and costly for the country to import food.

When weather shocks coincide with major global economic downturns the risk to food availability and food access are, therefore, amplified, and low-income and net food-importing countries face the greatest risks. Moreover, these risks are likely to be even more pronounced in the context of the COVID-19 induced economic crisis, due to unique challenges posed by social distancing requirements and restrictions on the movement of people. For example, face-to-face extension services, used in many countries to provide farmers with seasonal weather forecast information and guidance on appropriate seed varieties and crop mixes, have been put on hold. This may reduce the capacity of some farmers to anticipate impending weather shocks, leaving them more vulnerable than before. Without policy actions to reduce the impacts of the dual threats posed by the COVID-19-induced economic crisis and weather shocks, potential reductions in national food availability may be far worse than previously seen and may persist longer.

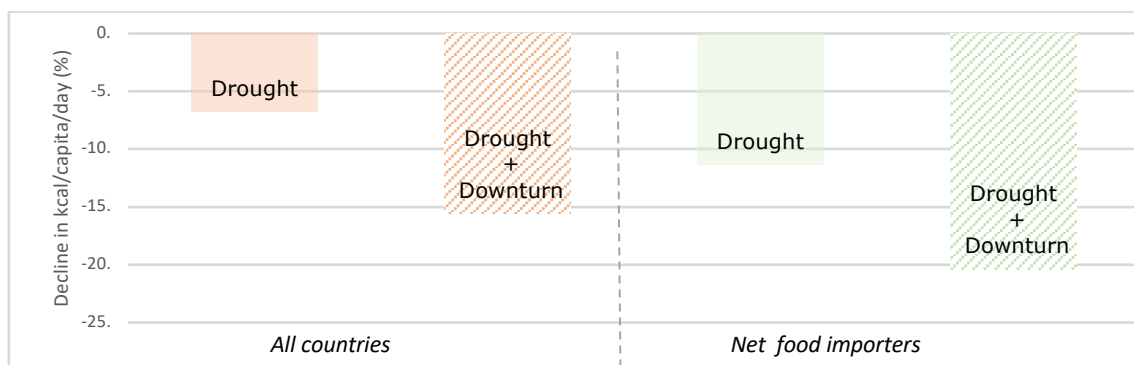
## QUANTIFYING HOW THE DOUBLE THREAT OF WEATHER SHOCKS AND ECONOMIC DOWNTURNS INFLUENCE FOOD AVAILABILITY

The COVID-19 crisis is unprecedented and creates conditions for a wide range of complex impacts on food availability and access which are difficult to forecast. However, it is useful to look to the past in order to anticipate how food availability within a country may respond to weather shocks, and how these responses may differ when they occur during major global economic downturns.

To explore these relationships, this brief makes use of three global data sources. First, food availability is measured in terms of kilocalories available through production and trade per capita per day. These data come from FAOSTAT and include 183 countries (FAO, 2020c). Global economic downturns are identified based on contractions in global trade using trade data reported by the World Trade Organization (WTO) (WTO, 2020).<sup>1</sup> In total, five major global economic downturns are identified since 1980. Finally, data collected by Centre for Research on the Epidemiology of Disasters (CRED) at the University of Louvain are used to identify major natural disasters at a national level. In this analysis, droughts are the natural disaster that we focus on.

Analysis of these data show that in years when droughts occur during normal economic periods, affected countries experience an average reduction in food availability of 6.8 percent relative to unaffected countries (Figure 2). However, when droughts occur during a global economic downturn, the reduction in food availability is more pronounced. The average additional decline in food availability in the context of this dual threat is 8.8 percent greater meaning that the cumulative decline in food availability for countries experiencing drought in the context of a global economic downturn is around 15 percent. The contraction in food availability during dual threat scenarios is particularly pronounced for countries that are net food importers. In these countries, the data show that when droughts occur during economic downturns, food availability decreases on average by about 20 percent.

**FIGURE 2 | The impact of drought on average food supply**



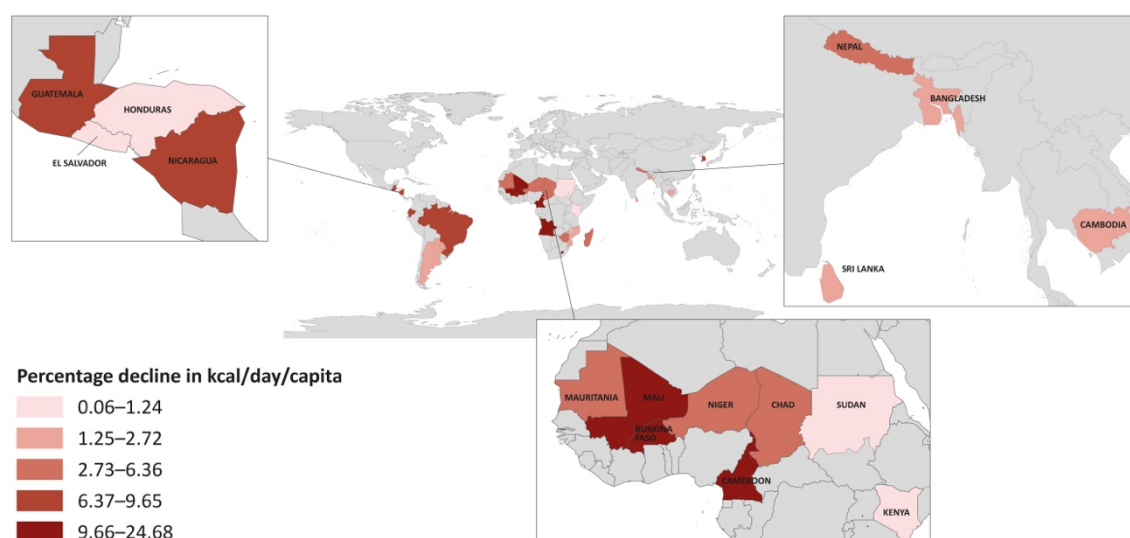
*Notes: The figure shows the average percentage change in food supply in countries affected by a drought and countries affected by a drought in the context of a global economic downturn. The negative changes are measured relatively to countries not affected by a drought and their differences are statistically significant at 5 percent level.*

*Source: Authors' own elaboration.*

<sup>1</sup> A global trade downturn is defined as a reduction in the value of global trade by 3 percent relative to the previous year. Years of trade downturns considered are: 1982, 2001, 2009, 2015 and 2016.

Geographically, the analysis shows that the risks to food availability posed by the dual threat of droughts in the context of a global economic downturn have historically been concentrated in Latin America, the Sahel region and parts of South and South-eastern Asia (Figure 3).<sup>2</sup> These countries are primarily net food importers, with large agrarian populations, and many are highly dependent on exports of high value agricultural commodities to generate foreign exchange. As a result, food availability in these countries is highly sensitive to both weather events and global economic conditions.

**FIGURE 3 | Since 2000, the double threat of global economic downturns and drought have affected food availability in mostly poor, net food-importing countries**



*Notes: The boundaries and names shown and the designations used on this/these map(s) do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries. Dashed lines on maps represent approximate border lines for which there may not yet be full agreement.*

*Source: Authors' own elaboration. Conforms to UN World map, February 2020.*

Of the 28 countries where food availability was reduced more by the combined impacts of drought and global economic downturns than by drought alone, 21 are net food importers and 20 are classified as low or lower-middle-income countries. This highlights the vulnerability of these countries to multiple threats affecting local and international food systems, and the need to take pre-emptive actions to reduce the impacts of these shocks.

### WHAT CAN BE DONE TO REDUCE FOOD SUPPLY SHOCKS IN THE CONTEXT OF A DUAL THREAT?

Policy makers should consider a combination of short-term strategies to reduce the immediate impacts of the COVID-19 crisis on food availability, particularly in those regions that are likely to experience anomalous weather conditions in the coming months. These must be combined with longer term investments to increase the resilience of agriculture and food supply chains to climate shocks and enable learning from the recent experience to be better prepared for the future shocks.

<sup>2</sup> Other weather-related shocks, such as flood or heat waves, may have different geographic distributions.

In the short-term, countries, particularly net food importers, can take steps to ensure that sufficient supplies exist within countries or can be easily mobilized when needed. These steps may include:

- reduction in import tariffs on food items and greater predictability on food tariff rates (for more details see FAO, 2020b);
- supporting efficient food storage to reduce food loss and waste;
- where feasible, using public resources to secure call options on local or international commodity exchanges to hedge against future price volatility;
- increase the resilience of the global food value chains to ensure continued functioning during the crisis situations (for more details see FAO, 2020d).

Farmers and other food system actors must also be protected to support sustained food access and livelihoods. Strategies to consider include:

- scaling-up access to formal weather risk management tools;
- facilitate access to low cost agricultural finance and allow for flexible repayment schedules;
- leverage extension services and existing farm support programmes to promote more resilient farm systems, including promotion of farm diversification;
- scaling-up and scaling-out existing social protection schemes to ensure that vulnerable farmers and agricultural-dependent workers are adequately covered (for more details see FAO, 2020e);
- ensure that timely seasonal forecast information is provided to farmers to allow for informed investment decisions. This may entail greater investments in dissemination of information through media, given the limitations on gatherings and face to face extension services caused by COVID-19 containment measures.

To support building longer-term resilience, actions should be focused on:

- designing and implementing agricultural policies that support the development and uptake of climate adaptive agriculture practices and technologies by farmers;
- investing in research and development of climate-resilient technologies;
- investing in strengthening of the climate-resilient infrastructure (ports, rails, roads and telecommunication);
- ensuring macro-economic stability to enable countries to respond to crises.

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