

Food Crisis—Cascading Events from COVID-19 & Locusts

“There are no famines yet. But I must warn you that if we don’t prepare and act now – to secure access, avoid funding shortfalls and disruptions to trade—we could be facing multiple famines of biblical proportions within a short few months.”—[Warning of the WFP](#) (World Food Programme) Chief to the United Nations Security Council, 21 April 2020

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ABSTRACT

This is a longer read since we, the authors, haven’t seen much discussion in the EA community about the impacts from COVID-19 on global food security and therefore we thought it would be useful to provide an overview of the current situation and upcoming risks. If you are short on time please read the last section *“Call to action: Food Crisis Handbook”* and read the following key takeaways:

- There is currently a food crisis and it will get worse. It is expected that the number of people on the brink of starvation will double from 135 million to 260 million within the next few months.
- This crisis adds to already existing hunger issues, including the 821 million people who are already food insecure.

- There are 5 major areas to this crisis: Loss of food purchasing power, farmers facing disruption of capital, inputs and market access, global supply chain disruptions, trade policies restricting food exports and the worst locust plague in decades.
- In the last section is a call to action to contribute to a Food Crisis Handbook. Please take a look and see if you can help.

1. Why is there a food crisis?

Despite sufficient global food stock (the 3rd highest in history), we are facing an imminent food crisis that threatens hundreds of millions of people. Why is this? A mixture of shocks affecting production, transport, prices and access affect every aspect of our food system.

Many nations have issued lockdown measures to prevent the spread of COVID-19. This section will analyse the cascading effects of these lockdowns on food access. Most affected is food purchasing power and accessibility in less developed countries (LDCs). In these regions between 50 and 90% of the workforce is part of the informal sector ([ILO](#)). These people are often unbanked, lack social protection measures and get paid on a day-by-day or week-by-week basis. Due to the lockdowns, their source of income is gone. Without any savings, they are unable to afford food, and risk starvation.

Due to travel restrictions and self-isolation, farmers, which can be highly dependent on seasonal workers, are lacking the labour to harvest their fields and transport their yields from the rural areas to the markets. Farmers who are used to this supply chain lack sufficient storing capacities, meaning that [one rain can destroy whole harvests](#), if the crops don't rot on the fields in the first place without being gath-

ered. Similar events have also been observed in more developed nations, where the demand for long lasting foods like rice or pasta has gone up while the demand for fresh vegetables has shrunk, leading to [vast spoilage of harvests](#).

Expanding the scope to a more holistic view, we can see similar disruptions to the global food system, which is heavily interconnected, with almost every region in the world depending on imports and exports. Many ports around the world have [declared restrictions](#), like 14 day quarantines for vessels coming from COVID-19 affected regions. This causes significant delays in the global supply chain, since shipping makes up over 90% of the global trade. Additionally, port-workers might quarantine at home or fear off-loading cargo due to COVID-19 related health risks. In Latin America's largest port, it almost came to a [strike](#) of 5,000 dock workers. These labour shortages further delay the supply chain. This in turn can lead to spoilage of foods and increase the price of freight, contributing to increased food prices which then affects food affordability—as can be seen in Addis Ababa, Ethiopia, where prices of key staples rose between February and March by 50 to 100%.

In an attempt to keep local prices low and ensure the food security of their own population, some nations have started increasing import volumes and declared food export restrictions or bans. This is especially devastating for nations which are net food importers (e.g. parts of the Middle East or parts of Sub-Saharan Africa which are dependent on humanitarian aid). These trade restrictions, coupled with stockpiling of key staples, further increase food prices—and analogous to a prisoner's dilemma, they usually lead to everyone being worse off (which is why they are also known as "Beggar-thy-neighbour-policies"). As of

29 April 2020, 15 countries have already issued [food export restrictions](#) or bans, locking up 2.5% of global calories. "This is similar to 2007/2008, when 4.7% of global calories were affected, rice prices increased by 216%, wheat by 136% and maize by 125%. Other countries, including Russia, have also threatened to escalate measures, and these measures are subject to daily review" ([quote](#)).

Additionally, the world is facing the worst locust plague in decades. This is affecting huge parts of the East Horn of Africa and the Middle East and is spreading towards South Asia, plunging over 20 million people into food insecurity ([FAO](#)). Due to the current pandemic and the associated logistic challenges, capacities to combat the spread, have slowed down. This is worrying since desert locust swarms can grow in size exponentially.

All of the above is adding to already existing hunger. Over 821 million people were already food insecure before these issues, of which 135 million people are experiencing crisis levels of hunger (i.e., the brink of starvation) and 100 million people's livelihoods depend on the WFP.

2. Scope—How bad could it get?

Current trends indicate that this already bad situation will get worse. [The World Bank states](#) that 2.6 – 7% of food production could be lost in Sub-Saharan Africa alone. [The WFP expects](#) that globally, an additional 130 million people will experience crisis levels of hunger, bringing the total to 265 million.

There's also a risk that fewer crops will be planted because of the uncertainties that farmers are facing. Without guaranteed food markets or migrant labour, farmers may decide that planting crops is not worth

the investment. A [survey](#) of village officials in 1,636 Counties in China found that “60% of respondents were pessimistic about the planting season, and China plans to increase imports of key staples.” This could cause an actual food shortage, rather than just a crisis of distribution, in the future.

This may partly be compensated for because farmers may switch to lower labour crops such as rice. But this may in turn lead to malnutrition because there will be fewer nutritious fruits and vegetables available. *“Vegetable production, trade and consumption are particularly affected by COVID-19 because of their highly seasonal nature, high labor needs, perishability, and the need for good storage and distribution logistics (IFPRI).”* Lack of daily vitamin C, say from fruits and vegetables, is generally linked with greater immunodeficiency, potentially worsening the health effects from COVID-19 and other diseases. Furthermore, 1.6 billion children are also out of school due to lockdown, of which 370 million are missing school meals. This could lead to malnutrition and stunted development later on. Child malnutrition can have [many long-lasting negative effects](#).

Additionally, as mentioned above, there is an unprecedented locust outbreak across the horn of Africa and parts of the Middle East and Asia. It is the worst locust situation seen in Ethiopia for 25 years, and the worst in Kenya for 70 years. Locusts are particularly damaging to juvenile crops rather than mature ones, and a swarm of locusts of 1 km² can consume as much crops as 35,000 people would. Some of these swarms span hundreds of square kilometers. Locust swarms, like pandemics, also grow exponentially. It is estimated that if left unchecked, swarms would grow 400x by June (compared to January), which is why some have termed the plague [Locust-19](#). In Ethiopia,

South Sudan and Yemen, over 80% of the cropland has been impacted, and a third wave of locusts is a possibility. Recent favourable conditions enabled the swarms to spread up to Iran and Pakistan; where they could further spread over India and parts of (South) Asia.

While some risks are unlikely, these risks do warrant discussion because of the large amount of suffering and damage they could cause. We expect that our EA audience here will appreciate this. Which is why the second half of this section looks at potential tail risks.

According to the UN Food and Agriculture Organization ([FAO](#)), desert locust swarms have the potential to spread over areas of 29 million km² and extend into 60 countries, threatening the livelihood of 10% of the world's population. This amounts to 20% of the total land surface area in the world.

One devastating scenario would be a global supply chain breakdown, either through failure of managing continuity amidst the pandemic or through trade policies, locking up >10% of global calories and / or >10% of agricultural inputs, like seeds, fertilizers and agro-chemicals. Such disruption of trade could create the need in food importing regions for unprecedented [alternative food production](#) or quickly scalable foods like Macroalgae ([seaweed](#)).

The [EU commission](#) has called for nations to *"Refrain from the introduction of export restrictions or other distortive measures in the agri-food sector. There is no global supply shortage at this time and such measures are completely unjustified."* Fortunately, over 50 nations have already signed a [treaty](#) which states that they won't issue food export restrictions. However, this treaty is nonbinding, and as of April 24 key exporters like China, Russia and India haven't signed yet.

These intersecting risks (of loss of purchasing power, locusts, loss of food access) could also lead to widespread [civil unrest](#). One precedent for this is the role of the [food price spikes](#) between 2007 and 2011 as one causal factor among others for the Arab Spring. Additionally, macroeconomic impacts and policy could shift power dynamics where existing geopolitical tensions exist, possibly increasing the likelihood of conflict.

3. What needs to be done to avoid the crisis?

Policy work and technical innovations

We argue there are 5 major key areas to this crisis and we advocate for some solutions below. In all cases, policies should be tailored to the specifics of the country or region, such as demographics, share of workforce in the informal sector, reliance on food imports, and food purchasing power by the population. As in many other cases, more data are needed to help inform decisions and policies. In the last section of this post, "Call to action", we discuss what kinds of information are needed.

The first key area is **social protection**. As described, many factors (such as supply chain disruptions) may increase the price of food to unaffordable levels for many of the world's poorest. We encourage the design of social protection measures that help the most vulnerable, can be easily and widely distributed, and can be implemented with social distancing. We believe food vouchers are a promising option, as they are easily distributable, maintain agricultural supply chains, and are unaffected by localised food price spikes. Advocating for these policies would potentially be high impact.

The second key area is **supporting farmers**. This is important to prevent an actual food shortage in the medium term. Migrant workers could be declared as essential workers (to enable travel) and contract farming could be established where trust in future food markets is low. In contract farming, governments, retailers, companies or insurers partner with farmers and guarantee to buy their crops at a set price, removing the risk of depending on a local food market. Additionally, advocating for flour fortification (enriching flour with micronutrients, e.g. iron) seems to be a tractable measure to combat regional malnutrition. One supplement could be vitamin D3, which seems to correlate with less severe COVID-19 symptoms (see [here](#) and [here](#)).

The third key area is **keeping ports open and global supply chains running**. Single ports often service very large areas, so they represent potential single points of failure. Chatham House has identified [14 major choke points](#), including the Suez Canal, that are crucial for international trade. Delays there could exacerbate existing issues, such as an existing fertilizer shortage in [some areas](#).

Ports need to be kept open, and workers at ports and adjacent services should be considered essential workers. There should also be strict hygiene measures at the ports in order to increase worker safety and reduce outbreak risk. Workers on ships could be required to self-isolate prior to departure to reduce risks of infection. Having reserve staff of essential workers is important in these times because of the risk of sickness or fear of sickness.

The likely medium term impact (3-18 months) of COVID-19 on key supply chains, such as power, seeds, fertiliser, agrochemicals and grain, is still poorly understood. For this reason, we advocate for mapping the geographical distribution of key supply chains, key choke-

points/vulnerabilities and stakeholders, as well as developing policy recommendations to ensure the functioning of these. Undertaking this analysis, as well as influencing policy in this realm, could potentially be very high impact.

The fourth key area is **trade policy**. Advocating for key exporters—specifically, the US, India, and Russia—to maintain grain exports could be particularly high impact for anyone who may be able to influence policy in Washington DC, Delhi or Moscow. Food export restrictions disproportionately impact farmers, depressing local prices. Major agri-companies are well placed to advocate for this, and convincing them to do this could also be high impact. We also suggest that some countries could lift import tariffs or restrictions on food because these policies may no longer serve their original purpose in this crisis and may be harmful.

We also have some suggestions for foods that could be quickly scaled up and grown at this time, and especially if the situation worsens considerably. Macroalgae production in coastal areas is particularly promising. Lastly, it is important to stop the **locusts**, and especially to stop the swarms from growing exponentially. We are not aware of significant direct work that can be done; however, donations to the FAO in immediate days would quell the spread of the locust outbreak (see section “5. Where to donate to?” for details).

4. What has been done so far:

Globally a vast number of projects are emerging to help lessen the impact of the COVID-19 pandemic, where the majority focuses on the spread and healthcare aspects of the outbreak. Less effort has been put into the cascading effects of the pandemic, especially in the next

3-18 months. Nonetheless some key global players are preparing and responding and contributing. Here we provide a non-exhaustive list of some key actions that are being undertaken, in hopes that this can serve as a starting point. If you think there's something that should be done and that isn't on this list, please go to the last section of this post (Call to Action) and consider contributing to the *Food Crisis Handbook* (that is being developed).

- [The World Bank](#) is deploying \$160 billion over the next 15 months to help developing countries strengthen their pandemic response. In addition, debt payments have been suspended for the poorest countries.
- The FAO is leading on the locust front through tracking teams on the ground as well as insecticide logistics.
- WFP is equipping their teams with the health supplies they need to keep operations going and is already supporting 100 million people who would otherwise starve.
- The EU and 21 other WTO members [pledged](#) to ensure well-functioning global food supply chains.
- The [African Development Bank](#) (AfDB) was able to raise \$3 billion from its Fight COVID-19 social bond, "to fund public and private efforts to tackle the viral pandemic in Africa. [This] is the largest social bond ever issued in capital markets."
- The [Asian Development Bank](#) (ADB) is providing a \$20 billion COVID-19 response package. Parts of this are being used for social assistance programs, for example in Indonesia and the Philippines.

- The [UK Department For International Development](#) (DFID) is helping the FAO with the locusts plague through monetary assistance and modelling of where the locusts will go next, preparing mobilization of spraying efforts.
- The Bill & Melinda Gates Foundation is supporting COVID-19 responses all over [Africa](#) (e.g. in [Ethiopia](#)).

ALLFED's contributions:

For the past 2 months, ALLFED & their associates have reported on emerging risks/events and circulated these information to multilaterals, agricultural companies, governments and academics, to forewarn and inform early action decision making, as well as advising governments directly. Special acknowledgements go out to ALLFED's co-founder Ray Taylor, who has kicked off work on the COVID-food link. This work benefitted greatly from his foresight and insights, some of which he gained from witnessing the effects of lockdowns on food purchasing power in India firsthand. As a result, ALLFED were early actors in warning about the cascading risks to the food systems and back in March produced a "COVID-19 Cascading Food Risks Report".

Sahil Shah, (ALLFED's specialist advisor, supported by their core team), guest authored with Molly Jahn (Obama's Undersecretary of Agriculture) this [Atlantic Council article](#) which covers many considerations and policy recommendations that are echoed in this post.

5. Where to donate to?

We have conducted research but haven't yet found any organisation with a compelling case to donate to. (We do have some low-confi-

dence considerations though.)

It is hard to estimate the counterfactual of donations to help maintain food purchasing power for the most vulnerable, since over \$100 billion are allocated to help in that area.

Work on preventing the spread and growth of locust swarms seems to be especially time sensitive. The next 1-3 months could be the most important to avoid mass destruction of crops and widespread impact. This is due to the fact that locusts multiply 20 times every 3 months, worsening the situation if left untreated. The FAO is leading on the locust front and we expect them to update their funding appeal in the coming days. Their last funding appeal is not available currently and we will update this post when we know more.

More research is needed and potentially highly impactful.

6. Call to action: Food Crisis Handbook

Open collaboration and better data are needed to prevent mass starvation. Sahil Shah is setting up a *Food Crisis Handbook* to inform decision makers, policies and coordinate response actions. See the [Coronavirus Tech Handbook](#) for a similar project.

The goal of the Food Crisis Handbook is to provide a platform that includes:

1. Sources of real time data of food system status;

- 1. Inputs** from farmers on access/price of seeds/fertiliser/capital and early warnings of locations where planting is not occurring - for national stakeholders, agri-companies, insurers,

and development community;

2. **Production** updates from farmers on issues, such as harvesting labour (due to lockdown), lack of storing capacities due to supply chain issues and details on yields to inform national stock estimates;
 3. **Storage** estimates including imports/exports and production to map out likelihood and size of shortfalls to inform key exporters/the development community;
 4. **Transport** updates on internal rail and road freight for food, spoilage rates, food market access, shipping and ports;
 5. **Prices/Affordability** updates from local food markets and tracking loss of purchasing power to inform where governments may want to intervene
 6. **Availability** updates from those most vulnerable when food access is fully deprived;
2. **Knowledge bank for key stakeholders;**
1. **Supply chain recommendations** to ensure continuity amidst regulatory measures, sickness and reduced maintenance procedures, including real time updates on supply chains, e.g. from ports;
 2. **Purchasing power recommendations** to ensure food is affordable, and to inform how cash/rations/food vouchers could be distributed;
 3. **Lessons learnt:** case studies to assess what worked or

didn't work in some countries to inform policy decisions in others;

4. **Updates on food systems** (see 1.)
 5. **Updates on export restrictions** from IFPRI's export tracker, plus additional information about potential upcoming bans;
3. **Room for collaboration**—which could be as simple as setting up self-organising multi-disciplinary, multi-stakeholder WhatsApp groups, ordered under a particular theme such as:
1. **Agricultural Inputs:** Linking seed/fertiliser/agro-chemical companies with farming groups, local NGOs and governments and agricultural banks, for real time data-flow across parties and between different communities;
 2. **Production:** Linking farmers with wholesalers, local government, insurers and local NGOs to reduce issues around seeding and harvesting;
 3. **Transport:** Linking farmers with wholesalers, retailers, trucking-, rail- and shipping companies, ports and government to ensure food transport both nationally and internationally;
 4. **Policy:** Linking national and multilateral policy makers with experts across relevant fields;
 5. **Research:** Providing an environment on what kind of research is most needed and enable researchers to convene, obtain feedback and publish work;
 6. **Aid/Donations:** Provide a list of sources of funding as well as

provide evaluated options of where individuals and institutions could donate to in order to combat the food crisis

Please consider contributing to this collaborative effort. Helpful contributions could come from volunteers, export specialists, policy writers, agriculture experts, data analysts and people in the global development/humanitarian aid sectors (to name a few). Those with expertise building open source projects or with community building can also help with designing and implementing the project.

Contact via Email: [team \[at\] ALLFED.info](mailto:team@ALLFED.info)

ALLFED is also more broadly responding to the cascading impacts from COVID-19, across technical, policy and community solutions. We would welcome anyone who would like to collaborate, especially around supply chain impacts, fortification and technical solutions to quell the locust outbreak.

Additionally, due to the wide ranging effects of trade restrictions we deem connections to the Russian, Indian, Chinese and US governments to be highly valuable, due to the ability to advocate for continued free flow of food and agricultural inputs.

Appendix

Further reading

IFPRI (International Food Policy Research Institute) blog post series on food crisis:

<https://www.ifpri.org/landing/covid-19-blog-landing-page>

Research/News feed by CGIAR providing evidence-based advice and recommendations on COVID-19 and the emergent food crisis:

<https://www.cgiar.org/news-events/all-news/?destination%5B0%5D=covid-19>

[Here](#) is an article that shows the connection between food imports, exports, food storage and food security. [Here](#) is their GitHub to see the data behind the maps.

Livetrackers

Real time shipping disruption info: <https://www.nepia.com/industry-news/coronavirus-outbreak-impact-on-shipping/>

Real time map of port restrictions: <https://wilhelmsen.com/ships-agency/campaigns/coronavirus/coronavirus-map/>

Food Export Restriction Tracker (shows % of global kcal locked-in): <https://public.tableau.com/profile/laborde6680#!/vizhome/ExportRestrictionsTracker/FoodExportRestrictionsTracker>

Livemap where harvest or sowing seasons need to be accelerated: <http://www.fao.org/2019-ncov/covid-19-crop-calendars/en/>

Locust live tracker:

<https://locust-hub-hqfao.hub.arcgis.com/>

Databases

FAO databases (only till 2017 - but shows patterns of imports and exports and storage and production over the years—shows fluctuations

and trends).

<http://www.fao.org/faostat/en/#data/FBS>

Interactive map on global trade by Chatham House (can be filtered for different foods and commodities):

<https://resourcetrade.earth/data?year=2018&importer=231&category=2&units=weight>