

The Crisis We Can Still Avert

The Potential Human Cost of Agriculture Losses in 2022

By September of 2022, the global food crisis had gotten so extreme that [205.1 million people urgently need humanitarian food assistance](#) just to survive. Tragically, if we do nothing, **the crisis could grow by another 620.9 million people in the next 6 months. That is the crisis we can still avert.** Investing in food production, increasing resilience, and functioning markets can stave off this crisis if we act fast.

A recent report from [Gro Intelligence and CRU Group](#) estimates that the impacts from the Ukraine crisis on nitrogen fertilizer availability in the global agriculture system will lead to a total loss of 72 trillion calories of food produced in 2022 alone.¹ That loss would cause 620.9 million MORE people who are already struggling to meet their basic food needs to lose at least one more meal a day for the next 6 months. This is the crisis that is coming—growing the current crisis by more than three times higher the [205.1 million](#) people already experiencing food crisis.

Gender inequality will play a significant role in this crisis. Based on current trends in gender equality and food security, 332.8 million of these people will be women. That means **44.7 million more women than men could miss one meal a day for the next 6 months.** Women could miss 8.5 billion more meals than men.

This is not a foregone conclusion. We can still act to prevent the worst of the crisis. The number of calories lost is only part of the story. **Food insecurity is as much as story of inequality as it is of food production.** If we could ensure that every person on Earth bore an equal share of the burden of food lost, losing 72 trillion calories from the global food system would be manageable. If we could perfectly manage the loss of food over the course of twelve months, the loss of 72 trillion calories would result in every man, woman, and child giving up 15 meals, a little more than one meal per month for a year. That's not ideal, but it is a food impact that the global system could absorb without permanent damage to people in the world.



621 million MORE people could lose one meal a day for the next 6 months



44.7 million
More women than men could miss meals in the next 6 months

We don't live in an equal world. The other end of the spectrum—where the burden falls on only people in the most vulnerable regions in the world, and it results in an immediate and total loss of food for those people—would cause **1.3 billion to starve. In a scenario of maximum inequality, the result the equivalent of every single person in the U.S., Mexico, Europe, and Japan starving to death.**

We have the opportunity to shift the impacts of this crisis—to make sure that people can access the safety nets to cope with food crisis, the agriculture inputs to grow more food, and the decision-making power and market access to buy the nutritious food they need.

¹ 72 trillion calories is a mid-range estimate, and the number could be as high as 186 trillion calories lost if the situation continues and there are chronic fertilizer shortages over a longer period of time. For the purposes of this report, CARE chose the mid-range estimate.

Recommended Actions

To avert this crisis, and to ensure that it is not catastrophic for millions of people around the world, we must immediately:

- **Move fast:** Ensure that all emergency investments in food security are implemented with speed, transparency, and flexibility.
- **Grow more food now:** All investments must prioritize resilience efforts alongside traditional emergency food assistance, supporting small-scale farmers to produce sufficient, nutritious food for their local communities.
- **Invest in gender equality in the food system.** Women not only eat last and least, they also farm last and least. This damages the whole food system and lowers food production around the world. Investing in gender equality will increase food production and reduce the number of people who face food crisis.
- **Invest in the future:** These investments must also include support for sustainable agriculture practices that support healthy communities and are less dependent upon chemical inputs and global supply chains.
- **Act across sectors:** No one actor can meet the incredible crisis we are facing. All actors—from governments to multi-lateral organizations to private sector companies must invest resources in averting this crisis, or risk kicking off the worst famine we have seen globally.

Who will lose meals

The reality we expect is neither perfect equality spread out over a whole year nor maximum inequality that results in immediate food loss. Instead, the most likely scenario is that the 72 trillion calories lost will hit the most at-risk people in the world hardest over the next 6 months. If we can curb the shock to the food production system and build resilience quickly, we may be able to prevent further decline. If we do nothing to address the longer-term crisis, as the crisis in Ukraine continues, droughts persist in many parts of the world, and climate shocks like the floods in Pakistan continue, it is likely that the food production will remain low, and the world will lose even more calories in 2023 and beyond.

There are 3 main predictors of people who are likely to lose meals because of this crisis:

- **How many resources you have:** The burden of lost production is likely to fall hardest on people who are already [living in extreme poverty](#).² People who are already close to the edge of their safety net, or who have already started to miss meals, are the first who will miss out as prices rise and supplies fall. People, no matter where they are, who are living below the poverty line of \$1.90 per day will face an enormous burden. As production falls, food prices rise everywhere in the world. The fertilizer crisis adds to a fuel price increase and the [largest cost of living increase in a generation](#). In 2021, there were 731 million people living below the poverty line. The UN estimates that the crisis in Ukraine will push at least 95 million more people into extreme poverty. That is a total of **826 million people living below \$1.90 per day**. Since there are 205.1 million people already experiencing food crisis, the difference that agriculture production losses could cause is **620.9 million people**.
- **Where you live:** This food crisis will hit some countries harder than others. [53 countries and territories in the world are already facing food stress and food crisis](#). 37 of those countries are predicted to lose more than 0.5% of their agriculture production because of the fertilizer losses in the current crisis. The additional fuel crisis and cost of living increases will further burden people in systems that are already

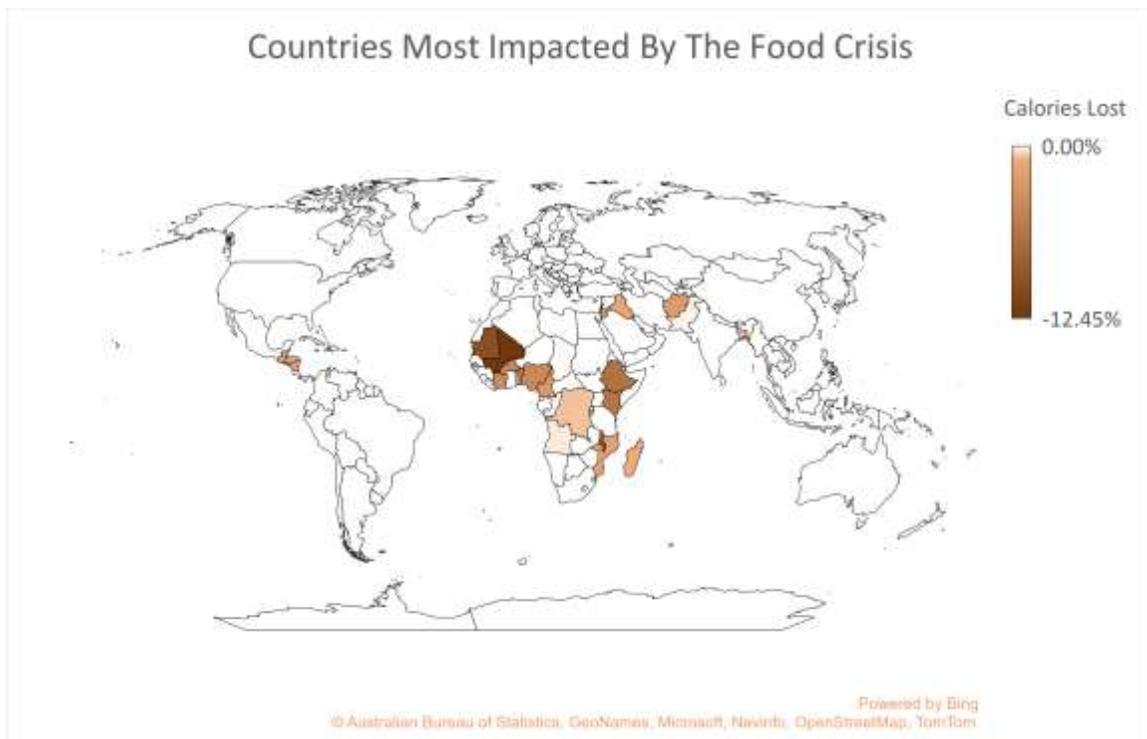
² For the purposes of this report, we are using the number of people who already live in extreme poverty as people who are likely to be most likely to miss meals because of reduced agriculture production.

struggling to deliver food to people who need it most.

- **Who you are:** people from historically marginalized groups are hardest hit by every crisis—and the food crisis will be no different. Women, people with disabilities, LGBTQI+ people, and people who are ethnic or religious minorities in their own communities and countries will be the first to lose out and have the hardest time accessing services. Tragically, of historically marginalized people, global datasets only allow us to look at differences between men and women consistently.³ Even that is an imperfect dataset which does not allow a nuanced understanding of experiences for people under the age of 15.

Geographic burden

Countries with agriculture production loss. According to the most recent estimates, 54 countries will lose more than 2% of their agriculture production. The production loss will fall most heavily on the people in countries where there is lower production—both because less food will be available and because that will drive up prices for imported food and remove options to switch to other food sources as prices rise. **1.48 billion people live in countries that will experience a higher than 2% loss of agriculture production.**



This comes on top of extreme droughts, the loss of agriculture because people cannot afford seeds, and the likely post-harvest loss because people will not be able to get their crops to market. For example, in [Sierra Leone](#), women have cut their trips to the market from once a week to once a month because they cannot afford the cost of transportation. The crops that people do produce are at risk because they cannot get them into the market for others to buy. In [Ghana](#), many poor farmers have cut the size of their fields in half because they cannot afford seeds and other inputs to plant their whole fields. In [Nigeria](#), women are choosing not to plant at all because the potential crop production does not outweigh the security risks of planting and they cannot be sure they will earn money on their current crops.

³ The [Food Insecurity Experience Scale](#) is the only global dataset that allows sex-disaggregated analysis of food security. That dataset does not include sex-disaggregated experiences for people under the age of 15. For the purpose of this analysis, we applied the sex-disaggregated data to people of all ages, using the same methodology and assumptions outlined in the [technical annex here](#).

Countries already experiencing food crisis. According to the [Integrated Food Security and Nutrition Phase Classification](#) (IPC), 53 countries and territories are already facing **food crisis**, with some percentage of their populations missing meals and facing acute malnutrition. As food prices rise and agriculture production falls, food insecurity will spread in these markets that are already stretched. **1.8 billion people live in countries that are already facing food crisis.** Of those 1.8 billion people, more than **446.4 million people are already experiencing stress** to meet their basic food needs or are currently in food crisis. They are likely to experience the biggest and most immediate impacts of the food crisis.⁴ 199.1 million of them are already facing food crisis or worse.

Methodology

Math behind “The Crisis Still to Come: Potential Human Cost of Agriculture Losses in 2022.”

Assumptions:

These calculations are necessarily based on assumptions about what will happen in the future. We apply two simple rules with assumptions:

1. Chose moderate or conservative methodologies rather than the ones that result in the largest possible estimates.
2. Make the simplest and fewest possible assumptions.

Calories:

According to the Food and Agriculture Organization (FAO), a person needs a minimum dietary energy intake of 1,828 calories daily. According to the FAO, human energy requirements are key to understand if food supplies are sufficient to meet the nutritional necessities among the population.⁵ It takes 30 days for a person, consuming that number of calories to starve. Using these two values we can assume on how much people could be impacted by the 72 trillion calories reduction. In this math scenario we are assuming all food conditions are equally shared, and there are not inequalities.

1. Most equal impact number:
 - a. Divide 72 trillion calories by 609 calories per meal = 118.1 million meals lost globally.
 - b. Divide those 118.1 million meals lost globally by [7.836 billion people living in the world](#) = **15 meals lost per person in one year.**
2. Multiply 30 times the Minimum Dietary Energy intake established by the FAO which is, 1,828. (It takes 30 days missing that many calories to starve)
 - a. 30 days x 1,828 calories = 54,840 calories to starve in 30 days. For example, each person represents 54,840 calories.
3. Divide the 72 trillion reduction by the calories to starve in 30 days calculated in the previous step.
 - a. 72,000,000,000,000 calories reduction / 54,840 calories to starve in 30 days = **1,312,910,284 people could starve to death by this reduction.**



⁴ This data comes from the May 2022 IPC report—before the full extent of the Russia-Ukraine crisis was factored into predictions. [Integrated Food Security and Nutrition Phase Classification](#)

⁵ Food and Agriculture Organization (2001). Human Energy Requirements. <https://www.fao.org/3/y5686e/y5686e.pdf>

4. To put it in easier terms from a global perspective, we can divide the previous amount by the total world population:
 - a. 1,312,910,284 people that could starve to death / 7,836,630,790 world's population from the 2021 World Bank data set. **This equal to 17% of the global population starving.**

How Many People Likely Impacted:

The [Gro Intelligence and CRU Group](#) report highlights which countries will be most impacted by production losses, and what percent of production each relevant country will lose. For the purposes of this report, CARE looked at the number of people living in extreme poverty (826 million people) minus the number of people who are already facing food crisis (IPC3 or above) [Integrated Food Security Classification](#) (IPC). Those calculations result in 620.9 million⁶ people who will be most severely impacted. *See calculation below.*

72 trillion calories divided by 609 calories per meal divided by 620.9 million people = 190 meals lost per person. **This is that out of the 620.9 million people, each of them could lose 190 meals.** This is losing just over one meal a day for the next 6 months.

Sex-disaggregated analysis:

To calculate the gender gap, we started with the indicator on the number of moderate or severe food insecurity in the adult population (15+), as reported on [FAO Stat](#). **Gaps in age disaggregation.** Because FIES data only covers the sex-disaggregated experiences in the adult population (over the age of 15), and it does not provide the ability to estimate the differences between boys and girls under the age of 15, we chose to extrapolate this data to the entire global population to understand what the gap might look like if it also includes boys and girls under the age 15. While the underlying indicator is not built to report on sex-disaggregation in young people's experience of food insecurity, there is no indicator that measures sex-disaggregated experiences of food insecurity under the age of 15. FAO's validated data— all available for download and exploration at [FAO Stat](#)—does not endorse extrapolating data in this way because the Food Insecurity Experience Scale is designed to measure sex-disaggregated experiences only in people who are 15 years old or older. However, because CARE's work focuses on women and girls, we worked to understand the comprehensive picture of food insecurity, understanding that girls under the age of 15 also face significant inequality and many of the same challenges and social norms that adult women face.

Rather than creating a complex set of assumptions with limited theoretical grounding, for the purposes of this estimate, we chose to rely on the simplest possible assumption: that the rates of food insecurity are similar among young people as they are for adults.

332.8 million women could lose one meal per day

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288.1 million men could lose one meal per day =

44.7 million more women than men could lose one meal per day

The need to rely on these assumptions, highlights gaps in the data and existing research base that needs further exploration. **The experiences of young men and women are not clearly represented in the current data.** Similarly, the lack of sex disaggregated data on hunger and undernutrition are clear and glaring gaps that merit further exploration and research in future years.

To replicate our calculations:

- 1) Download regional sex disaggregated on the prevalence of food insecurity data from [FAO stat](#).
- 2) For the World figure in 2021, divide the number of adult women food insecure (939.1 million) by the total number of food insecure women plus the total number of food insecure men (939.1

⁶ On Table 2, the two columns in the right, when added, show the 446.4 million people.

million women + 812.8 million men). This results in 53.6% of people who are food insecure are women. Correspondingly, 46.4% of food insecure people are men.

- 3) Multiply the number of additional people who will be missing one meal per day by the percent of food insecure people who are women: 620.9 million people x 53.6% women = 332.8 million women.
- 4) Multiply the number of additional people who will be missing one meal per day by the percent of food insecure people who are men: 620.9 million people x 46.4% men = 288.1 million men.
- 5) Subtract 332.8 million women – 288.1 million men = 44.7 million more women than men.
- 6) 332.8 million women x 190 meals = **women could be missing 63.4 billion meals**
- 7) 288.1 million men x 190 meals = **men could be missing 54.9 billion meals**
- 8) 63.4 billion meals – 54.9 billion meals = **women could lose 8.5 billion more meals than men**

Note that in some cases decimals were rounded, therefore the numbers do not show the exact value but a close estimate.

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This brief was written by Emily Janoch, Miriam Selva, and Rachael Lehman. The information in this brief is up to date as of October 11, 2022. Further updates will be made as more data becomes available.