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Rock Bottom View:

Isn't Denial of Climate Change Really a Nod to Continued Inflation?



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Extreme weather events worsened by climate change is a hidden cause of inflation, threatening to push up already high prices of everything from food and clothing to electronics. Severe weather events, like hurricanes, wildfires and droughts, devastate entire communities while costing billions to rebuild. It also affects industry, from energy to transportation and agriculture, leading to a significant rise in food costs for millions.



"If we ignore it and don't do anything about climate change, it will become a staggering cost. And it will have a huge impact not only on grocery bills, but many other aspects of our ordinary lives," said Suzi Kerr, chief economist at the Environmental Defense Fund.



Corn (and wheat above) waits to be harvested on land leased by Tempe Farming Co., Thursday. The Colorado River has been a go-to source of water for cities, tribes and farmers in the U.S. West for decades. However, climate change, drought and increased demand are taking a toll. The U.S. Bureau of Reclamation is expected to declare the first-ever mandatory volume cuts from the river for 2022-2023.

The Big Picture.....

- Climate change is capable of devastating entire U.S. industries, especially agriculture.
- Farmers in Florida are facing that reality after multiple hurricanes have damaged the state's citrus farms.
- As the pandemic has shown, disruption to supply chains and workers' productivity drives up the cost of doing business. And one way or another, (smaller size store portions and packaging, but without lower price, usually) companies pass those costs onto consumers.
- Workers facing more strenuous conditions tend to command a higher wage, Solomon Hsiang, a professor of public policy at UC Berkley, says. And if companies have to pay more to protect them or install new equipment like air conditioning in warehouses, someone's got to pay and at the end of the day that someone is usually the consumer. Finally, when people take longer breaks to recover from heat exhaustion, or leave 15 minutes early, for example, lost productivity adds up day after day, Carleton said.
- Long-lasting heat waves like the ones in the U.S. and China are expected to become more commonplace — just as global inflation is leading to a slowdown of economic growth. Climate disasters have cost North America \$415 billion, much of it due to wildfires and hurricanes.

Why it matters: Heavy rainfall, flooding, heat waves and droughts erode agriculture yields, infrastructure, and workers' ability to stay on the job — all of which lead to supply-chain breakdowns and worker shortages.

Driving the news: Our society for now still seems comfortable labelling these critical events, “as 50, or 100, or 500 year occurrences”, though in reality atmospheric anomalies keep coming with more and more regularity, and of more biblical magnitude. Chip and solar panel factories in one of China's key manufacturing regions just shutdown, as the country tries to ration power during a 60-year record heat wave.

- Dairy and meat prices in Europe are rising even higher as droughts destroy lands meant for grazing and growing grain for feed.
- In the U.S., wheat fields in Kansas, Oklahoma, Nebraska and cotton harvests in Texas have also been withering due to drought.
- And in California, production of processed tomato products earlier suffered due to a lack of rain (many of the same fields now freezing under near-spring snowfall) while workers are starting to walk off the job at an Amazon delivery hub partially in protest of heat exhaustion.
- Destruction from historic rains and floods in the Northeast, North Carolina, Europe and South Korea demonstrates how ill-equipped our infrastructure is to withstand climate change impacts — and how difficult it is for communities to rebuild, let alone get back to work.

Climate change isn't viewed as a major contributing factor for high prices just yet, but as severe weather events increase in frequency and devastate industries that contribute to the U.S. economy, experts warn it increasingly will be if temperatures keep rising.

Treasury Secretary Janet Yellen said, while speaking in North Carolina last year, that climate change can manifest itself in “acute, weather-related supply shocks,” that create sharp reductions in capacity and raise prices for consumers.

The Environmental Protection Agency (EPA) has also warned that climate change can and will disrupt food availability, reduce agricultural productivity and interrupt food delivery. EPA warned that, “spikes in food prices after extreme events are expected to be more frequent in the future.” It's a reality that Florida is currently experiencing firsthand after Hurricane Ian hit the state and resulted in higher prices for frozen orange concentrate orange juice by more than 5 percent and could have long lasting impacts with at least 75 percent of Florida's citrus belt under threat of heavy flooding.

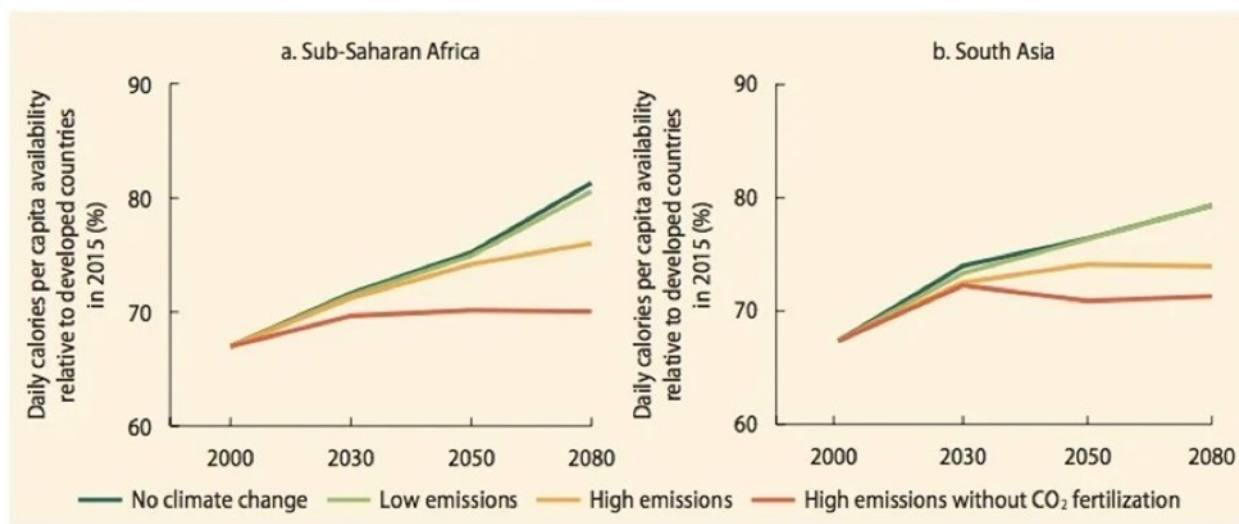


Workers in the Philippines helping fishermen after a typhoon. (Photo: Ted Aljibe/Getty Images)

Though current see-saw record snowfall and rain may alter long-term outcomes, California is another. The U.S. Department of Agriculture (USDA) has noted in 2023 that U.S. orange production is expected to drop 13 percent to the lowest level in 55 years. Poor results are due to the affected fruit set, the stage where a flower turns into a berry — driven by California's severe drought.

Maladaptation of U.S. corn and soybeans to a changing climate is also a quantifiable phenomenon. Long-run adaptation of U.S. corn and soybean yields to changes in temperature and precipitation were quantified over 1951–2017. Results show that although the two crops became more heat- and drought-tolerant, their productivity under normal temperature and precipitation conditions decreased. Over 1951–2017, heat- and drought-tolerance increased corn and soybean yields by 33% and 20%, whereas maladaptation to normal conditions reduced yields by 41% and 87%, respectively, with large spatial variations in effects.

Changes in climate are projected to reduce average corn and soybean yields by 39–68% and 86–92%, respectively, by 2050 relative to



Source: Havlik et al., forthcoming.

Note: Results are based on simulations from the Global Biosphere Management Model (GLOBIOM) in a scenario with large population growth and little economic growth.

Climate Change Can Significantly Reduce Food Availability In Poorer Regions

2013–2017 depending on the warming scenario. After incorporating estimated effects of climate-neutral technological advances, the net change in yield ranges from (–)13 to 62% for corn and (–)57 to (–)26% for soybeans in 2050 relative to 2013–2017. This analysis uncovers the inherent trade-offs and limitations of existing approaches to crop adaptation. Concerns about the impact of climate change on agriculture have led to a growing interest in adapting crops to the increased frequency of harmful weather events such as extreme heat and drought.

Numerous advances have been made in crop cultivars and management to enhance their stress tolerance to extreme climate conditions. These advances include new breeding technologies (e.g., marker-assisted selection genomic selection and gene-editing) and improved practices. However, some studies find that current breeding programs are not preparing crop cultivars sufficiently for climatic variability and others find that crop cultivars adapted to extreme climate conditions might perform worse under other conditions. For instance, productivity of heat-resistant plants could be reduced under normal temperatures and drought-resistant cultivars can perform worse than conventional ones when sufficient water is available.

Studies analyzing the adaptability of heat and drought tolerance traits through laboratory and field experiments do not provide systematic evidence of the extent to which crops are becoming more resilient overall to climate conditions or whether the directions of climate-neutral technical change and climate adaptation efforts are synergistic or conflicting.

These severe weather events are happening at a time when the price of goods is especially high, with food prices in the U.S. rising 11.4 percent over the past 12 months — the largest annual increase since May 1979. That's along with record high prices for electricity, housing, gas and a broad range of other products. Climate change's current role in driving up the prices of goods and services is relatively tolerable, but if we ignore it and don't do anything about climate change, it will become a staggering cost.

Climate change will have a huge impact not only on grocery bills, but many other aspects of our ordinary lives. Climate change is expected to continue, causing all sorts of severe weather events. The U.S. West has been in a long-running drought since 2020, which is expected to continue, unless current enormous snowfall can correct outcomes without overflowing into the Pacific Ocean.

As well, research from the journal *Nature Communications* also found that hurricanes have increased in frequency and destructiveness over the past 150 years, with climate change considered a major factor. Even Federal Reserve Chairman Jerome H. Powell said last year during the Green Swan conference that climate change risks the world economy and that, “there is no doubt that climate change poses profound challenges for the global economy and certainly the financial system.”

What Does It All Mean?....

Understanding the economic impact of climate change is critical, as an analysis by Columbia University's Climate School noted climate disasters have cost North America \$415 billion,

much of it due to wildfires and hurricanes. Every degree Celsius that the Earth warms, there's an estimated 5 to 15 percent decrease in overall crop production. That will hit American farmers who are likely to struggle to maintain their fields and adapt to changing weather conditions — causing prices to increase. Increased costs may also come in the form of lost wages and medical bills, as a warming climate adds to the risk of waterborne and food borne diseases and allergies. Columbia estimated temperature extremes are projected to cause the loss of two billion labor hours each year by 2090, resulting in \$160 billion of lost wages.

Congress has taken action against climate change and current inflation, most recently through the Inflation Reduction Act (IRA), which includes provisions to mitigate climate change through a host of different measures, such as tax credits for energy production and investments in technologies including wind, solar and geothermal energies.

IRA also includes a new program to reduce methane emissions from oil and gas by offering grants and loans to help companies that reduce their emissions while charging fees to those with excess emissions. Kerr believes that the Inflation Reduction Act is a “game changer” and carries strong potential to reduce energy costs in the U.S. and could set

an example for the rest of the world about what's possible when addressing climate change.

So by looking past the problems, denial of climate change really is a nod to continued inflation. Hard, recurring data proves so. If our future existence on Earth could be limited only to inconvenience, we would be getting off lightly. Especially as scientists, engineers, mathematicians, and those charged with innovating for the future, real quantifiable data is undeniable. **Hence, we treat this critical change phenomena accordingly; we must be change agents for at least a minimally livable planet.**

Until next time, we at EPM will keep an eye on the issues that matter, embracing the unpredictable and encouraging professional opportunities to encourage the path forward. From this old porch at Rock Bottom Ranch in Central Texas, y'all take care.

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