

Our food system is the bullseye for solving the world's climate challenges

The industrialized food system is a major source of greenhouse gas emissions.

By **Reynard Loki**, August 17, 2023, **SOURCE** Independent Media Institute



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The impact of agriculture on climate change is significant. According to the Environmental

Protection Agency (EPA), the agriculture sector is responsible for **10 percent of the total**

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U.S. greenhouse gas emissions, after transportation (29 percent), electricity production (25 percent), industry (23 percent), and commercial and residential usage (13 percent). However, according to Peter Lehner, managing attorney for EarthJustice, a nonprofit environmental law firm, the EPA estimate is “almost certainly significantly quite low.”

Lehner argues that most analyses exclude five unique sources of emissions from the farming sector: soil carbon (carbon released during the disturbance of soil), lost sequestration (carbon that would still be sequestered in the ground had that land not been converted into farmland), input footprints (carbon footprint for products used in agriculture, like the manufacturing of fertilizer), difficult measurements (it is harder to measure the carbon emissions of biological systems like agriculture than it is to measure the emissions of other industries that are not biological, like transportation), and potent gases (like methane and nitrous oxide).

Regarding that last source: Focusing on carbon dioxide as the main greenhouse gas often ignores powerful planet-warming gases that are emitted by agriculture and that are even more potent than carbon dioxide. Methane, which is emitted by the burps and farts of ruminants like cows and sheep, has up to 86 times more global warming potential over a 20-year period than carbon dioxide (and also impacts public health, particularly in frontline communities). Nitrous oxide, a byproduct of fertilizer runoff, has 300 times more warming potential than carbon dioxide (and also harms plants and animals).

“Most other studies, including by the [United Nations (UN)] and others, say that agriculture contributes much closer to 15 or 20 percent or more of world greenhouse gas emissions,” Lehner points out.

Miscalculating agricultural emissions

A systems engineering analysis of climate science and animal agriculture published in

the Journal of Ecological Society in 2019 by Sailesh Rao, the founder and executive director of Climate Healers, an environmental nonprofit, backs up the claim that the majority of analyses of agricultural emissions are low. Rao’s paper found that “animal agriculture is the leading cause of climate change, responsible for at least 87% of greenhouse gas emissions annually.”

According to Rao, there are “four major miscalculations in the IPCC [Intergovernmental Panel on Climate Change] reports, which systematically undercount the climate change impact of animal agriculture.” These miscalculations relate to carbon dioxide, methane, land use, and the timeline of analysis (using data only from the Industrial Era onward, which discounts the long-term contribution of animal agriculture to historical emissions).

Rao’s abstract states:

“We show that we need to transition to a global plant-based economy first and that blindly eliminating fossil fuel usage first will accelerate the warming of the planet. We show that the annual methane emissions from animal agriculture alone cause more incremental global warming than the annual CO₂ emissions from all fossil fuel sources combined. We further show that the transition to a global plant-based economy has the potential to sequester over 2000 Gigatons (Gt) of CO₂ in regenerating soils and vegetation, returning atmospheric greenhouse gas levels to the “safe zone” of under 350 parts per million (ppm) of CO₂ equivalent, while restoring the biodiversity of the planet and healing its climate. This paper clearly illustrates why the scientific community, government institutions, corporations, and news media, who vastly underestimate the role of animal agriculture and focus primarily on reducing fossil fuel use, need to urgently change their priorities in order to be effective.”

Tackling food systems at global climate summits

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Agriculture was not a central topic of discussion at the UN Climate Change Conference, COP26, held in Glasgow, Scotland, in 2021. “Despite [the] huge impact to ecological systems and climate,” writes Suzannah Gerber, a nutrition scientist and fellow of the National Institute of Food and Agriculture—a research agency within the U.S. Department of Agriculture—“specific high-level talks about agriculture comprised less than 5 percent of all official negotiations and less than 10 percent of side events, favoring the less controversial topic of renewable energy.”

And while renewable energy supporters cheered the fact that the Glasgow Climate Pact is the first UN climate agreement to explicitly mention “coal” and “fossil fuels”—something that the fossil fuel industry fought hard against in previous summits, and that China and India managed to water down in the current agreement—the pact makes no mention of the words “agriculture” or “food.”

Deforestation and methane emissions were main topics at COP26 (resulting in pledges to reduce both), but agriculture—which is intimately linked to deforestation and land-use change—was relegated to a sideline topic. “Unlike forest, finance, and transport—that got the feted ‘title of a day’ at ... [COP26]—agriculture was taken up as part of ‘Nature Day’ on a Saturday,” reported Richard Mahapatra for Down to Earth. “Outside the venue, thousands protested against a gamut of things, including step-motherly treatment to food systems that have been a major source of greenhouse gas... emissions.”

Governments did a better job addressing the agriculture and climate connection the following year at COP27, held in Sharm el-Sheikh, Egypt, in November 2022. At the conference, governments actively engaged in intensifying efforts to reduce greenhouse gas emissions and enhance adaptive measures in the agriculture sector to combat the challenges of climate change.

During the discussions, an important milestone was reached with the establishment of a comprehensive four-year plan focusing on agriculture and food security, which included the mobilization increased financial resources to drive the transformative changes needed in the agricultural sector by 2030. A pioneering initiative called Food and Agriculture for Sustainable Transformation (FAST) was also launched under the leadership of over 20 agriculture ministers and the Egyptian COP27 presidency.

“Practical lessons that can be scaled exist: from sustainable intensification of food systems to regenerative agriculture, to agroecology and related agroforestry,” said Dr. Agnes Kalibata, president of the Alliance for a Green Revolution in Africa. “Such solutions offer us an opportunity to build food, social-economic and ecological resilience to the negative effects of climate change. These practices work towards empowering communities against hunger and poverty, and ensure inclusion of marginalized communities and people.”

Meat Is murder—for animals and the environment

Forests continue to be clear-cut to make room for farms, such as factory farms—which supply humans’ appetite for meat—and plantations that produce the world’s most used vegetable oil: palm oil. Within agriculture, producing meat is the main climate problem: Plant-based foods account for 29 percent of the global food production greenhouse gas emissions, while animal-based food accounts for almost twice as much—57 percent—with beef being the main contributor. “Every bite of burger boosts harmful greenhouse gases,” said the United Nations Environment Program (UNEP). “Research shows that if cows were a nation, they would be the world’s third-largest greenhouse gas emitter,” according to UNEP. “As humans, meat production is one of the most destructive ways in which we leave our footprint on the planet.”

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UNEP states, “Between 1970 and 2011, livestock increased from 7.3 billion to 24.2 billion units, worldwide.” With such a staggering number of animals trapped in our food system, it should be no surprise that industrial farming is, as the animal rights nonprofit Animal Equality states, “the largest cause of animal abuse in history.” The group points out, “At no other time in history have so many animals died or suffered so much throughout their lives.”

A more sustainable future Is plant-powered

Animal-based agriculture is ultimately a poor way to feed a skyrocketing human population. “Farming animals is notoriously inefficient and wasteful when compared to growing plants to feed humans directly, with the end result that ‘livestock’ animals take drastically more food from the global food supply than they provide,” writes Ashley Capps, a researcher specializing in farmed animal welfare for A Well-Fed World, an international food security organization advocating for the transition to plant-based agriculture.

“This is because in order to eat farmed animals, we have to grow the crops necessary to feed them, which amounts to vastly more crops than it would take to feed humans directly,” writes Capps. “To give one example, it takes 25 pounds of grain to yield just one pound of beef—while crops such as soy and lentils produce, pound for pound, as much protein as beef, and sometimes more.”

Beef is so resource-intensive to produce, that it requires 20 times more land and emits 20 times more greenhouse gases per gram of edible protein than beans, lentils, and peas—all commonly farmed plant proteins, according to the World Resources Institute.

Switching to plant-based agriculture would help prevent food shortages, hunger, and even famine at a time when climate change is creating food insecurity across the globe. Patricia Espinosa, executive secretary of the UN Framework Convention on Climate

Change, had warned during the Saudi Green Initiative Forum in October 2021, that failure to stem the climate crisis “would mean less food, so probably a crisis in food security.”

A Well-Fed World points out that “[c]limate change is a hunger risk multiplier, with 20 percent more people projected to be at risk of hunger by 2050 due to extreme weather events. Unfortunately, the world’s most food insecure populations are also those disproportionately harmed by climate-related events, including increased heat waves, droughts, hurricanes, tsunamis, and flooding.”

Climate, conflict, and COVID-19: A perfect storm

“A perfect storm of conflict, climate crises, the effects of the COVID-19 pandemic, and rising costs for reaching people in need is causing a seismic hunger crisis,” warns the World Food Program, the food assistance branch of the UN. The agency launched a public appeal to the world’s billionaires to donate \$6.6 billion to save 42 million people across 43 countries from famine.

“Concurrently replacing all animal-based items in the U.S. diet with plant-based alternatives will add enough food to feed, in full, 350 million additional people, well above the expected benefits of eliminating all supply chain food waste,” according to a 2018 study by an international team of researchers published in the journal Proceedings of National Academy of Sciences of the United States of America. The authors note that the results of their study “highlight the importance of dietary shifts to improving food availability and security.”

The dietary shift from meat to plants is something that UNEP has underscored as a way to combat climate change and increase the efficiency of our food system. In their Emissions Gap Report 2021, the agency noted that—in addition to switching from the combustion of natural gas to renewables—“behavioral changes such as reduced consumption of cattle-based foods and reduced food waste and loss” present a

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significant opportunity to reduce methane emissions. “[F]ast methane action, as opposed to slower or delayed action, can contribute greatly to reducing midterm (2050) temperatures,” the [report](#) states.

In many ways, this behavioral change is already underway, as [veganism is on the rise](#). “It can be difficult to get an accurate picture of how many vegans there are in the U.S., but one survey found a 300 percent increase in vegans between 2004 and 2019, amounting to about 3 percent of the total population or nearly 10 million people,” [notes](#) Sentient Media, a nonprofit animal rights journalism organization. Still, even though there has been a steady increase in plant-based diets, [meat consumption is hitting record levels](#), aided by carnivores in low- and middle-income countries where incomes are on the rise, like [India](#) and [China](#).

Looking ahead

By 2050, the human population is [expected](#) to reach a staggering 9.9 billion people. (The Earth supports more than [8 billion people as of 2023](#); just 50 years ago, the global population was [less than half](#) that number.) To ensure global food security in 2050, the Food and Agriculture Organization (FAO) said that [food production](#) must increase by 60 percent.

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In a 2022 [Economist blog post](#), Alice Ruhweza, the Africa regional director of the [World Wildlife Fund](#) (WWF), an environmental nonprofit, urged nations to make food systems a priority. “From brands to retailers, manufacturers to farmers, it will take every organization and person involved in the food system to deliver on progress for climate and nature—ensuring our children have access to high-quality fresh food in the future which doesn’t cost the planet,” she writes. “Actions that food system organizations can take now include ensuring renewable energy is used on-site, investing in circular initiatives that simultaneously tackle food waste and address soil health, removing deforestation from their supply chain, and communicating to consumers in a way that makes plant-rich diets irresistible. All of this must be underpinned by a just transition for farmers—who are often the first to [feel the impacts](#) of climate change—and a firm commitment to [food security](#).”

If society can effectively address the runaway emissions of our broken, unsustainable, and inhumane industrialized food system—including moving humanity to plant-based diets—perhaps the existential climate crisis can truly be overcome. But that is a big “if.”