



PERSPECTIVE



## Effect of Greenhouse Gas Emissions from Agriculture

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### Description

Agriculture contributes to climate change by emitting greenhouse gases and converting non-agricultural land into agricultural lands, such as forests. The Agriculture, Forestry, and Other Land Uses Sector accounted for 13 percent to 21 percent of anthropogenic greenhouse gas emissions in 2019, according to the IPCC (AFOLU). Nitrous oxide, methane, and carbon dioxide emissions from agriculture account for half of the greenhouse gas emissions produced by the entire food industry, or 80 percent of agricultural emissions. Animal husbandry produces a significant amount of greenhouse gas emissions. A significant portion of greenhouse gas emissions are attributed to the agricultural food system. Agriculture contributes directly to greenhouse gas emissions through practices such as rice production and livestock rising, in addition to being a significant user of land and consumer of fossil fuels. Fossil fuels, land use, and agriculture have all been major contributors to the increase in greenhouse gases observed over the last 250 years. Monogastric and ruminant digestive systems distinguish farm animals. Ruminant cattle for beef and dairy products produce the most greenhouse gases; monogastric animals such as pigs and poultry produce the least. Monogastric types of consumption may produce fewer emissions. Monogastric animals are more efficient at converting feed and produce less waste. Climate-smart agriculture is a term that refers to a variety of strategies that can be used to help mitigate the effects of climate change and reduce greenhouse gas emissions. Higher efficiency in livestock farming, which includes both management and technology; a more effective process for managing manure; a lower reliance on fossil fuels and nonrenewable resources; a variation in the duration, time, and location of the animals' eating

and drinking; and a reduction in both the production and consumption of animal-sourced foods are some of these strategies. For a more sustainable food system, a variety of policies could help to reduce greenhouse gas emissions from agriculture.

Tilling of fields, planting of crops, and even the shipment of cultivated crops or food to markets for profit are all sources of carbon dioxide emissions. Agricultural carbon dioxide emissions make up about a quarter of all global greenhouse gas emissions. Reduced tillage, less empty land, returning crop biomass residue to the soil, and increased use of cover crops are all examples of farm practices that can help reduce carbon dioxide emissions. Methane emissions are produced by livestock, such as cows belching, and are the leading source of agricultural greenhouse gases worldwide. Each year, a single cow emits 220 pounds of methane, accounting for 14.5 percent of total greenhouse gas emissions. Despite the fact that methane has a much shorter residence time than carbon dioxide, its warming potential is 28 times greater. Livestock not only contributes to harmful emissions but also requires a lot of lands and may overgraze, resulting in poor soil quality and a reduction in species diversity. Increased use of synthetic and organic fertilizers contributes to nitrous oxide emissions. Fertilizers help crops grow faster and produce more yields. Nitrous oxide emissions from agriculture account for 6% of total greenhouse gas emissions in the US, and their concentration has increased by 30% since 1980. While 6% may seem insignificant, nitrous oxide is 300 times more powerful than carbon dioxide emissions per pound and has a 120-year residence time. Water conservation through drip irrigation, nutrient monitoring to avoid over fertilization, and the use of a cover crop instead of fertilizer may all help to reduce nitrous oxide emissions.