

# Policy and farm management help China mitigate climate change

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Tibet, China. Credit: Unsplash/CC0 Public Domain

Production of animal protein in China has increased by 800% over the past 40 years, driven by population growth, urbanization and higher worker wages. However, the amount of climate-warming nitrous oxide

released from animal farming in the country has not risen as quickly, thanks to science-led policy and farm management interventions in the way animals are fed and their manure recycled.

Those findings are presented in research published May 19 in *Nature Food*. The study, "Policy-Enabled Stabilization of Nitrous Oxide Emissions from Livestock Production in China Over 1978-2017," was authored by 12 researchers from 10 institutions in the United States and China, including Benjamin Z. Houlton, the Ronald P. Lynch Dean of Cornell CALS and professor of ecology and evolutionary biology and of global development.

"As the [world population](#) grows, we will need every weapon in our arsenal in the fight against [climate change](#), including reduction of nitrous oxide emissions from livestock production," Houlton said. "This study demonstrates a promising path forward for limiting such emissions through a coordinated national approach that combines policy interventions with adoption of more efficient farming technologies and methods."

Consumption of livestock products has increased, especially in the developing world, because of rising affluence and urbanization. Global livestock production accounts for roughly 8% of total human-caused emissions of greenhouse gases, such as carbon dioxide, methane and nitrous oxide. However, [livestock production](#) causes an estimated 24 to 44% of total global emissions for nitrous oxide, which is 300 times more harmful than carbon dioxide.

Over the past 40 years, [while global nitrous oxide emissions have increased 30%](#), China's have increased 286%, the researchers found; however, that increase occurred while animal protein production in the country increased roughly 800%, suggesting that science-led policies and farm management choices can help to increase food production while

mitigating [greenhouse gas emissions](#).

In their paper, the researchers explored which drivers helped reduce nitrous oxide emissions in China and which policies could support future mitigation efforts. At the national scale, the most effective climate-mitigation strategy was adoption of anaerobic digesters—technology that converts livestock manure into electricity while reducing greenhouse gas emissions. The most cost-effective strategy was adoption of animal feed that is lower in protein.

The researchers suggest that the greatest potential for future reduction in greenhouse gases would come from a combination of anaerobic digestion and composting on farms; these management strategies would require good planning, policy guidance and financial support from the Chinese government.

"The bad news is that greenhouse gas emissions continue to rise, including [nitrous oxide](#)," Houlton said. "But it would be even worse without the substantial mitigation efforts in China, which have improved agricultural efficiencies while starting to decouple production from emissions. Policy incentives that promote the adoption of circular systems in agriculture, including anaerobic digesters, will be key to building on the gains we have seen and could eventually even reverse emissions."

**More information:** Peng Xu et al, Policy-enabled stabilization of nitrous oxide emissions from livestock production in China over 1978–2017, *Nature Food* (2022). [DOI: 10.1038/s43016-022-00513-y](https://doi.org/10.1038/s43016-022-00513-y)

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