Researchers find climate efficiency of farming has been leveling off

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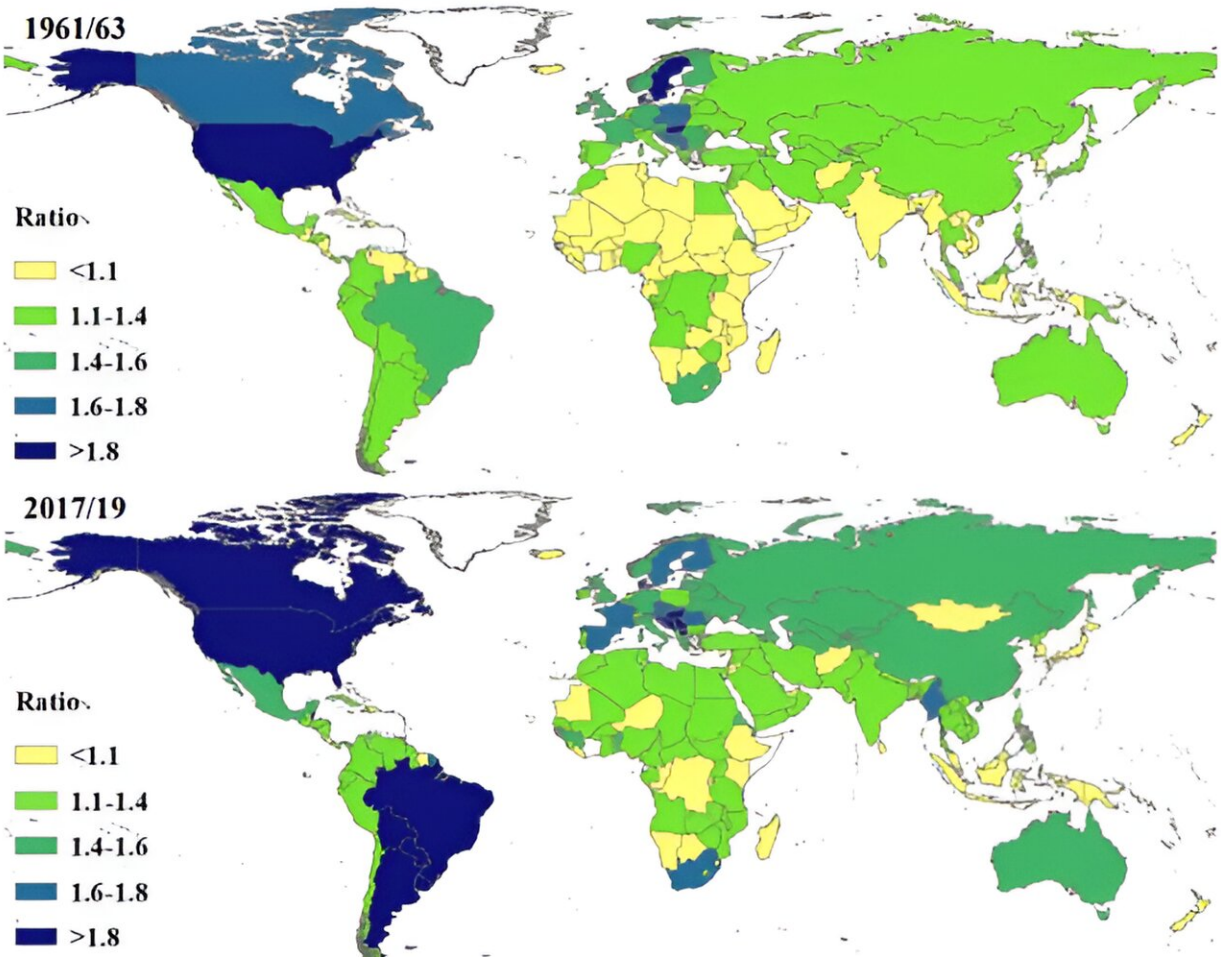

Spatial distribution of the ratio between final product and primary product GHG emission intensity in 1961/63 and 2017/19. Credit: *Proceedings of the National Academy of Sciences* (2024). DOI: 10.1073/pnas.2317725121

An international team of environmental scientists has found evidence that climate efficiency involving farming has been leveling off in recent years. For their study published in the *Proceedings of the National Academy of Sciences*, the group studied a half-century's worth of data to estimate greenhouse gas emissions per unit of protein from farming.

Prior research has shown that the farming industry produces approximately one-third of all human-related sources of greenhouse gas emissions—a statistic that suggests more work is required to find ways to produce foods that do not harm the planet.

For this new study, the researchers used food protein produced via farming practices, including both livestock and crops, as a means for measuring increases in efficiency that tend to reduce greenhouse gas emissions. They looked at data for the years 1961 to 2010, and found, as expected, that efficiency improvements led to a two-thirds drop in emissions, which is worthy of celebration.

Unfortunately, they found drops in efficiency improvements as they reached the latter years, suggesting that such improvements have begun to level off. This, they suggest, is worrying, considering that demand for food continues to increase.

Prior research has suggested that demand will increase by 50% over just the next 25 years. If efficiency gains are not as dramatic, greenhouse gas emissions from farming would likely increase dramatically.

The research team also notes that the accelerating expansion of cropland is also concerning as it reduces the amount of natural land, much of which is forest or rainforest, which is a major sink for carbon dioxide. They also suggest that one of the reasons protein needs are rising so fast is an increased global demand for meat, which is less efficient to produce than growing crops.

They also note that increasing amounts of crop material are being turned into fuel sources rather than used as food. And finally, they note that as the planet grows warmer, food prices and crop yields are likely to be impacted in ways that may defy predictions.

More information: Zhaohai Bai et al, Decline in carbon emission intensity of global agriculture has stagnated recently, *Proceedings of the National Academy of Sciences* (2024). DOI: 10.1073/pnas.2317725121