

Cutting livestock greenhouse gases requires effort from rich and poor countries

September 28 2012, by Brian Wallheimer

(Phys.org)—Regulating livestock greenhouse gas emissions could shift livestock production to unregulated, less developed countries unless those poorer nations can be enticed to preserve their forested lands, according to a Purdue University economic study.

Agriculture and deforestation account for about one-quarter of global [greenhouse gas emissions](#), with methane from [livestock production](#) being the most important type of farm-related emission. Alla Golub, a Purdue research economist at the Center for Global Trade Analysis in Purdue's Department of Agricultural Economics, Thomas Hertel, a Purdue distinguished professor of Agricultural Economics and executive director of the Global Trade Analysis Project, and Benjamin Henderson, livestock policy officer at Food and Agriculture Organization of United Nations modeled policies aimed at reducing emissions from livestock.

"Emissions from agriculture have not gotten as much attention as those from fossil fuels combustion. But when the world gets serious about tackling [climate policy](#), livestock will be an important part of that discussion," Hertel said. "Livestock sectors are the most important contributors to non-CO2 [greenhouse gas](#) emissions and would be seriously affected if a tax or regulations were implemented."

Their findings, with co-authors from the Food and Agriculture Organization of the United Nations, the Electric Power Research Institute and Ohio State University were published in the [Proceedings of the National Academy of Sciences](#). They showed that wealthy countries

alone would have limited success in decreasing greenhouse [gas emissions](#) from livestock production because it would give poorer countries, with greater greenhouse gas emissions intensities, an incentive to expand production.

"In this case, we would likely see continued expansion of pasture and cropping area in regions like South America as agriculture encroaches on forested lands," Golub said. "This negates greenhouse gas emissions reductions in the wealthy countries."

This led Golub, Hertel and their co-authors to examine what might happen if emission regulations in wealthy countries were paired with incentives to retain forested land in poorer nations. Without new grazing areas, those poorer countries would not expand their livestock production as much.

"Indeed, this combination of policies is quite effective at preventing 'emissions leakage' to developing countries while enhancing forest carbon stocks in the lower-income regions," Hertel said.

The effect, however, would be less meat available for consumption in the poorer countries and a price increase globally.

"Just like a fossil fuel emissions tax would raise prices for energy, this would have an impact on agricultural prices," Hertel said.

This unwanted impact on livestock consumption and production in poorer countries could be reduced by designing an appropriate policy, the authors found. Their study shows that wealthier countries could provide a subsidy that requires [poorer countries](#) to protect forested lands and shift to cleaner technologies, which would support those [countries'](#) output and consumption while reducing emissions.

More information: Global Climate Policy Impacts on Livestock, Land Use, Livelihoods, and Food Security, Alla A. Golub, Benjamin B. Henderson, Thomas W. Hertel, Pierre J. Gerber, Steven K. Rose, and Brent Sohngen, *Proceedings of the National Academy of Sciences*.

ABSTRACT

Recent research has shed light on the cost-effective contribution that agriculture can make to global greenhouse gas abatement; however, the resulting impacts on agricultural production, producer livelihoods, and food security remain largely unexplored. This paper provides an integrated assessment of the linkages between land-based climate policies, development, and food security, with a particular emphasis on abatement opportunities and impacts in the livestock sector. Targeting Annex I countries and exempting non-Annex I countries from land-based carbon policies on equity or food security grounds may result in significant leakage rates for livestock production and agriculture as a whole. We find that such leakage can be eliminated by supplying forest carbon sequestration incentives to non-Annex I countries. Furthermore, substantial additional global agricultural abatement can be attained by extending a greenhouse gas emissions tax to non-Annex I agricultural producers, while compensating them for their additional tax expenses. Because of their relatively large emissions intensities and limited abatement possibilities, ruminant meat producers face the greatest market adjustments to land-based climate policies. We also evaluate the impacts of climate policies on livelihoods and food consumption in developing countries. In the absence of non-Annex I abatement policies, these impacts are modest. However, strong income and food consumption impacts surface because of higher food costs after forest carbon sequestration is promoted at a global scale. Food consumption among unskilled labor households falls but rises for the representative farm households, because global agricultural supplies are restricted and farm prices rise sharply in the face of inelastic food demands.

Provided by Purdue University

Citation: Cutting livestock greenhouse gases requires effort from rich and poor countries (2012, September 28) retrieved 10 April 2024 from <https://phys.org/news/2012-09-livestock-greenhouse-gases-requires-effort.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.