US Agriculture's Environmental Impacts and Potential

Dan Rejto | Food Policy Impact 2020

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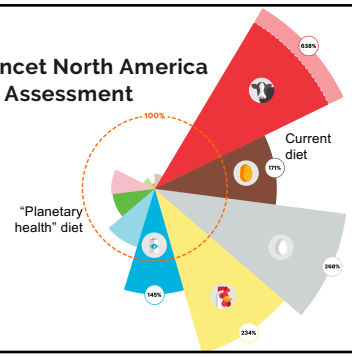
EAT-Lancet North America Dietary Assessment



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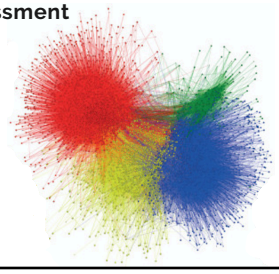
EAT-Lancet North America Dietary Assessment



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8 - 12% of US GHGs

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46% of land

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$210 billion in nitrogen costs

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2050 global:
>50% more food
~10 billion people

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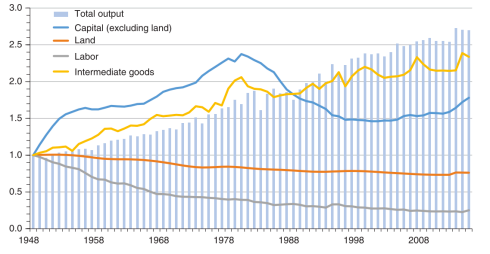
Agricultural sustainability trends



Note: Data are expressed with an index that is calculated relative to the data in 1948, where data in 1948 are set to equal 1. Intermediate goods include feed and seed, energy use, fertilizer and lime, pesticides, purchased services, and other materials used.
Source: USDA, Economic Research Service, "Agricultural Productivity in the U.S." series.

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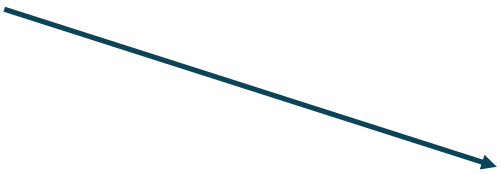
Falling impacts



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Falling impacts due to greater productivity

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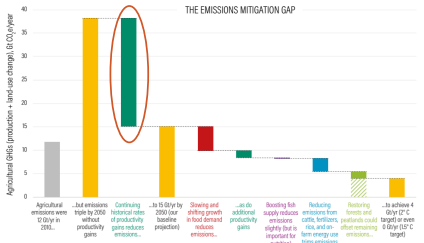
Raising global productivity is environmentally crucial



Note: These charts show the most ambitious "Breakthrough Technologies" scenario. "Restore forests and peatlands" item includes full reforestation of at least 80 million hectares of liberated agricultural land, in order to reach the 4 Gt CO_2e/year target by 2050 for limiting global temperature rise to 2°C. As an even more ambitious option, in order to limit warming to 1.5°C, full reforestation of at least 585 million hectares of liberated agricultural land could offset global agricultural production emissions for many years.
Source: DrawDown WRR model.

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Greater productivity – greater competitiveness

- Farmers compete in a global agricultural market
- US farmers export more agricultural products than any country

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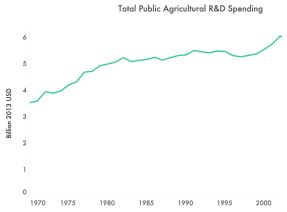
Public R&D key to improvements



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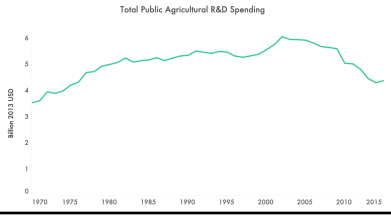
Public R&D key to improvements



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Emerging technologies require greater R&D

methane inhibitors

enhanced roots

nitrification inhibitors & microbial fertilizers

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The case for public R&D

The private sector tends to underinvest in R&D because:

1. R&D is often non-excludable: the cost of using research is low
2. Much R&D is long-term and risky;
   Private capital is short-termist and risk-averse

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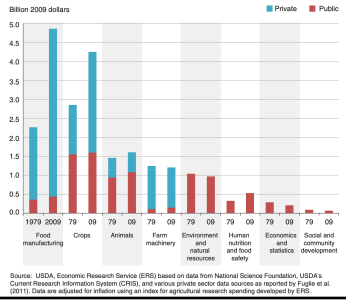
Public & private sector fund different areas



Source: USDA, Economic Research Service (ERS) based on data from National Science Foundation, USDA's Current Research Information System (CRIS), and various private sector data sources as reported by Fuglie et al. (2011). Data are adjusted for inflation using an index for agricultural research spending developed by ERS.

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"For many technologies, it has not been Adam Smith's invisible hand, but the hand of government that has proven decisive in their development"
-Fred Block

Thank you!

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