Assessing the environmental impacts of halving food loss and waste along the food supply chain

Jan 14, 2020

Author:
Quentin D. Read, Samuel Brown, Amanda D. Cuéllar, Steven M. Finn, Jessica A. Gephart, Landon T. Marston, Ellen Meyer, Keith A. Weitz, Mary K. Muth

Abstract: Reducing food loss and waste (FLW) is widely recognized as an important lever for lowering the environmental impacts of food systems. The United Nations Sustainable Development Agenda includes a goal to reduce FLW by 50% by 2030. Given differences in resource inputs along the food supply chain (FSC), the environmental benefits of FLW reduction will vary by stage of the FSC. Here, we identify the points along the supply chain where a 50% FLW reduction could yield the largest potential environmental benefits, assuming that decreases in consumption propagate back up the supply chain to reduce production. We use an environmentally extended input-output (EEIO) model combined with data on rates of FLW to calculate the scale of the total environmental impacts of the U.S. food system resulting from lost or wasted food. We evaluate the maximum potential environmental benefit resulting from 50% FLW reduction at all possible combinations of six supply chain stages (agricultural production, food processing, distribution/retail, restaurant foodservice, institutional foodservice, and households).

We find that FLW reduction efforts should target the foodservice (restaurant) sector, food processing sector, and household consumption. Halving FLW in the foodservice sector has the highest potential to reduce greenhouse gas output and energy use. Halving FLW in the food processing sector could reduce the most land use and eutrophication potential, and reducing household consumption waste could avert the most water consumption. In contrast, FLW reduction at the retail, institutional foodservice, and farm level averts less environmental impact. Our findings may help determine optimal investment in FLW reduction strategies.

Article published in Science of the Total Environment [1].
- Cutting food loss and waste by 50% could reduce the environmental impact of the U.S. food system by 8-10%.
- To minimize system-wide impacts, target foodservice, food processing, and households for food waste reduction.

Associated Project:
Food Waste and The Environment

Associated SESYNC Researcher(s):
jgephart
qread

DOI for citing:
https://doi.org/10.1016/j.scitotenv.2019.136255

Source URL:

Links
[1] https://t.co/Ywd2cfh3sv?amp=1