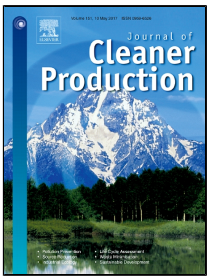
Accepted Manuscript



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PII:	S0959-6526(17)30845-4
DOI:	10.1016/j.jclepro.2017.04.118
Reference:	JCLP 9482
To appear in:	*Journal of Cleaner Production*
Received Date:	15 December 2016
Revised Date:	19 April 2017
Accepted Date:	19 April 2017

Please cite this article as: Luca Camanzi, Azra Alikadic, Luca Compagnoni, Eva Merloni, The impact of greenhouse gas emissions in the EU food chain: a quantitative and economic assessment using an environmentally extended input-output approach, *Journal of Cleaner Production* (2017), doi: 10.1016/j.jclepro.2017.04.118

Wordcount
- abstract: 386
- text, tables and references: 7,650

The impact of greenhouse gas emissions in the EU food chain: a quantitative and economic assessment using an environmentally extended input-output approach

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Abstract

In order to provide a valuable knowledge basis for future global warming mitigation strategies and policy implementation, this study carries out an integrated assessment of greenhouse gas (GHG) emissions throughout the EU-25 food supply chain, considering the highest available level of product disaggregation. Based on an environmentally extended input-output (EE-IO) approach, we estimate the environmental impacts resulting from the 'food and non-alcoholic beverages' supply chain from production to waste management, by 44 food products, grouped in 11 categories. Further, we perform a Structural Path Analysis to identify the hotspots along the supply chain with the highest emissions. Finally, we carry out an assessment of the economic impact of GHG emissions on each product category, considering both the related environmental pressure intensity and the cost of environmental damage (social cost). The results offer new insights on the amount, composition and origin of GHG emissions in the food supply chain. More precisely, detailed evidence is provided in support of the findings of previous studies that have shown that the contribution of farm-level activities on overall GHG emissions is mostly related to N_2O and CH_4 emissions. Moreover, we highlight the large environmental impact associated with CO_2 emissions, even if they are scattered among a very high number of activities, with a limited contribution each. Hence, we infer that multiple hotspots for CO_2 exist along the whole supply chain and that many of them occur in downstream stages, e.g. transportation, processing, packaging, waste disposal, as well as in the cold chain activities. As for the economic assessment of emissions, the highest costs are attributed to the highest emitting product categories, but the share of social costs of these emissions as compared to the overall production value, affect each product differently. Hence, the impact of a hypothetical price control measure, introduced to internalize the social cost of emissions, would vary significantly from one product category to another. Overall, our

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