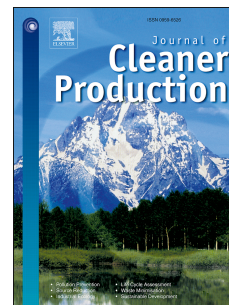


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T.C. Ponsioen, H.M.G. van der Werf



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# Five propositions to harmonize environmental footprints of food and beverages

T.C. Ponsioen<sup>a</sup>, H.M.G. van der Werf<sup>b</sup>

<sup>a</sup> Wageningen Economic Research, Wageningen University & Research, PO Box 29703, 2502 LS, The Hague, the Netherlands

<sup>b</sup> UMR SAS, INRA, AGROCAMPUS OUEST, 35000, Rennes, France

E-mail contact: tommie.ponsioen@wur.nl

## Abstract

Several attempts have been made to harmonize guidelines for environmental footprints of food and beverages. For example, the food Sustainable Consumption and Production Roundtable, the Leap partnership, and the Environmental Footprint project, in particular within the Cattle Model Working Group. Despite all these activities, there are still many issues unresolved. This paper gives an overview of five important reasons why it is so difficult to reach consensus within the sector. In short, the issues are: 1) how to allocate deforestation to land use activities; 2) how to assess agricultural emissions profiles; 3) how to make regionalized water scarcity assessments; 4) how to choose the functional unit of food and beverages; and 5) how to deal with multi-functional processes in agro-industry. Recommendations as motivated in this paper are, in summary, to: 1) use the method to calculate the amount of land use change caused by increased pressure from growing areas per crop in each country; 2) always calculate agricultural emissions using at least an intermediate level of detail with the option to add more detail; 3) use good quality irrigation and crop evapotranspiration data, and at least country specific water scarcity factors; 4) report the environmental footprint results per unit of economic value besides per unit of mass or volume to enable fairer comparisons; 5) and apply economic allocation in all multi-functional agricultural and agri-industrial processes based on realistic prices calculated as multiple year averages.

Keywords: life cycle assessment; environmental footprint; agriculture; food; beverage; methodological guidelines

## Highlights:

- Land use change should be related to increased pressure from growing cropping areas.
- Simple methods for calculating agricultural emissions should be avoided.
- Good quality/regionalized irrigation and evapotranspiration data should be used.
- Environmental footprint results should be communicated in economic value besides mass or volume.
- Economic allocation should be applied in multi-functional agricultural and agri-industrial processes.

## 1. Introduction

The number of life cycle assessments (LCAs) of food and beverages has been increasing exponentially for several years now. This can be seen for example by the number of publications on agricultural LCAs in scientific journals. A search in the Web of Science database, developed by Thomson Reuters scientific on the topic LCA AND (Agriculture OR Food) reveals seven published items in 2000 and 150 in 2016. The recent development and releases of agricultural background inventory data, for example in the databases GaBi Food & Feed (ThinkStep, 2016), AusLCI (Grant, 2015), World Food LCA Database (Nemecek et al., 2015), Agri-footprint (Blonk Agri-footprint, 2014), AGRIBALYSE (Koch and Salou, 2015) and ecoinvent (Weidema et al., 2013), are another result of the large scale effort to make LCA a standard tool for assessing environmental impacts and searching for improvement options in the sector.

These increasing agricultural LCA activities also come with a large variety of methodological choices made in the different papers and databases. As a response to this diversification, the Food Sustainable Consumption and Production Roundtable (Food SCP RT) was initiated and facilitated by the Joint Research Centre of the European Commission (EC-JRC) and attended by many companies, sector organizations and experts. The Food SCP RT resulted in the ENVI-FOOD protocol (European Food SCP Roundtable, 2013), recommending several methodological choices. However, the protocol still leaves a lot of room for interpretation. Later the Leap

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