



Formation of a research group on environmental and nutritional LCA methodologies – Call for experts

Terms of reference

Background

There is growing consumer demand and international calls to promote “healthy diets from sustainable food systems”.¹ Life Cycle Assessment (LCA) is an important tool for estimating the environmental impacts of food items, and is often used by food system actors (i.e. consumers, producers, food manufacturers, retailers) and policymakers as the basis for assessing and comparing the “sustainability” of different foods and diets. However, recent research and international discussions have raised several issues with the LCA methodologies used to assess and compare food items. Key problem areas include that most food item LCAs:

- only focus on one environmental impact, usually climate change contribution from greenhouse gases (GHG), as a proxy for “environmental sustainability”, and often do not include indicators or metrics for other environmental areas such as water use (i.e. impacts on water scarcity, eutrophication and acidification), biodiversity, and land use (i.e. land-use suitability and change impacts). This prevents LCAs from providing a clear picture of the overall environmental sustainability of food items;
- compare different food items on a mass or volume basis (e.g. kg of unit product) or sometimes by using a single nutrient (e.g. kg of protein), neither of which captures the broader nutritional benefits of different foods. This can mean the contribution of different foods to nutritional outcomes may be overlooked or misrepresented; and
- only use the climate change contribution metric GWP100, which has a number of limitations, including that it can underestimate the short-term and over-estimate the long-term global warming potential of short-lived gases such as methane (which is more prevalent in some agricultural production systems, such as ruminant livestock and rice production).

In addition, different indicators (with different levels of accuracy) are often used in LCAs to assess the same environmental impact, and results are often presented as a single integrated value. This makes it difficult to compare LCA impacts across similar and different food items, and over time.

These LCA food items methodology issues can make it difficult to identify where trade-offs exist between different environmental impacts (e.g. GHG emissions and water use), and to compare the contribution different foods make to human nutrition (which is also an important input for determining wider health impacts of food production systems).

While there is research which outlines potential ways to address these issues (and other LCA limitations) there is no internationally agreed best practice methodology for developing an environmental and nutritional LCA for food items. This is hindering the ability of food system actors and policymakers to

¹ For instance, through Action Track 2 of the UN Food Systems Summit 2021

develop robust multi-dimensional LCAs and make evidence-based decisions to encourage sustainable food systems and healthy diets.

Aims of the activity

A literature review will be undertaken to identify the key environmental and nutrition LCA methodology issues and opportunities for improving the environmental assessment of food items. This review will then be used to assist in developing recommendations on how to represent a range of internationally agreed key environmental and nutrition impacts in a way that can be compared across a wide variety of food items common to diets across the world (i.e. most plant, meat and dairy products). In turn, this could better equip food system actors and policymakers to assess and compare the environmental and health impacts of different food items.

This will include investigating:

- the functional unit used, with attention given to studies that have suggested incorporating nutrition into the functional unit and provided ways to use LCA to accurately capture the nutritional impacts of food;
- the methodologies and metrics used to measure contribution to climate change, including studies which investigate issues with using common metrics to assess the relative impact of different GHGs over different timeframes, as well as other methodological considerations (e.g. system boundaries, carbon sequestration) ;
- the methodologies and metrics used to measure other environmental impacts, including water quality, water scarcity, and land use, including relevance for decision situations at different geographical scales;
- how environmental and nutritional LCA metrics and indicators can be harmonised so that balanced and holistic comparisons can be made within and between a wide range of food items common to diets across the world (including plant, meat, and dairy food items).

This analysis will mostly draw on internationally recognized LCA methodology research. It will also need to refer to research which includes modelling that demonstrates the benefits and limitations of using different LCA methodologies. In some instances, it will need to refer to analysis of complementary environmental and nutritional assessment methodologies (such as cumulative impact mapping) to make recommendations about improved ways to measure the environmental and nutritional impacts of food.

Role and engagement

Research group members are invited to actively participate in four virtual meetings. Each meeting will last up to two hours. In addition to participation in the meetings, members are expected to continue to work on research group deliverables under the overall guidance of the lead author to deliver quality research products on schedule. Active participation in research activities also guarantees co-authorship of the research. Research group members report to the lead author. At this stage no honorarium is available for research group members and contributions are on voluntary basis; however, the governments of countries with participating members will be advised to provide financial support to these members, and the FAO will be investigating options for additional funding.

Minimum requirements include:

- Working knowledge of English.
- Skilled in team working and hence in sharing views and knowledge in a constructive manner.
- Highly motivated and committed to develop sound tools enabling to support transparent decision making at various scales and in all regions worldwide.
- Respect of cultural and scientific diversity of research group members.

Qualifications

Research group members are technical experts having a strong background in one or more of the following subjects: food LCA, nutritional LCA, environmental foot printing, sustainable agriculture and food systems, nutrition science. Ideally, members have a track record in research proven through peer-reviewed publications.

Timeline

The work will proceed in two phases: in Phase 1 the key methodological issues will be identified through a literature review, and in Phase 2 recommendations will be made about how to develop a best-practice multi-dimensional environmental and nutritional LCA.

| Group formation | Phase 1 1st Meeting to agree process | Phase 1 2nd Meeting to agree on content | Phase 1 Draft report on issues for presentation at the FAO Food Systems Pre-Summit | Phase 2 3rd meeting to agree process | Phase 2 4th Meeting to agree content | Phase 2 Release of the Issues and Recommendations Report ahead of the 2021 UN Food Systems Summit |
|------------------------|--|---|---|--|--|--|
| March 2021 | April 2021 | May2021 | June2021 | July 2021 | August 2021 | September2021 |

Note that after this work is complete the FAO will consider options for applying and adding to the research findings, including how socio-economic impacts could be included in a multidimensional LCA.

Application

Candidates are kindly requested to submit their CVs to the Secretariat (Maryam.Rezaei@fao.org) by 25 March 2021. CVs must include an updated list of publications and work experiences. All applications will be reviewed in March 2021. Merit and gender balance are two key selection criteria.