



Improving the agricultural modelling in Product Environmental Footprint

John E Hermansen

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Background

- During the pilot phase 2013-2018 a number of Product Environmental Footprint rules were elaborated , among others related to food and farming (beer, dairy products, feed, wine, pasta, olive oil, and leather).
- To support this, guidelines were produced also for modelling the environmental impact related to agriculture
- However, in the process it was found that the modelling of agriculture might have room for improvements and it was decided to establish an Agricultural Working Group (AWG) to come up with improvement suggestions
- AWG open to any TAB member with significant contributions (scientific, technic publications, guidelines)
- Contribution on a voluntary basis.
- Aim to work by consensus. EC takes final decision if needed (reporting all viewpoints). EC decide on the implementation in the EF framework.

Aim of the Agricultural working group (AWG)

The following tasks were identified for the AWG:

- To improve the modelling of impacts of pesticides
- To explore if the modelling of fertilizer's impact can be improved
- To identify a common approach to model flows/direct emissions related to feed digestion and manure management at farm
- To provide detailed guidelines for LCI modelling of water use
- To assess different approaches to measure biodiversity impacts and derive recommendations on how to complement or improve current indicators
- To provide mandatory primary data collection/quality rules for farm related activities

Pesticides

Present drawback: Too little attention to the different agricultural practice on emissions to the environment and the fact that emissions to soil (-living organisms) is not accounted for in the assessment. Preliminary recommendations (my interpretation)

- For ECO toxicity
 - to develop CF's for soil impacts (pt disregarded since soil is considered part of technosphere) and better models for distribution of pesticides to different compartments.
 - Consider better integration of impact of metals in the assessment – and look at outliers pt (Sulphur)
- For Human toxicity
 - It is problematic that impact of residues occurring in the food (through the crop harvested) and the impacts on farm workers are not included (which are major impacts)
 - Therefore best to disregard/downgrade human tox in food assessment until these deficiencies are solved (not all agree on this)
- Other concerns/issues
 - Maybe to have a separate indicator for pollinators?

Fertilizer

Challenge: at present a very simple modeling of N leaching as a fraction of N supply without considering specific crops or application procedures.

Issues discussed

- Better models for N & P losses, that reflects farmers improvement options re emissions
 - Some support for a nutrient balance based model
- Allocation in crop rotations, including when cover crops are included
 - Eg. N supplied to specific crops and P according to removal
- Allocation in organic fertilizer, including manure
 - May impact on the way manure is modelled in livestock systems pt.

Emissions related to feed digestion and manure handling

Overall idea is to ensure that improved practices can be reflected in the modeling of emissions

- Enteric methane emission
 - A first suggestion drafted, including effect of feed composition and use of additives – to be updated by the end of the year based on the final result of an EU project 'CEDER'
- Methane from manure storage
 - Under discussion
- Ammonia to air
 - Suggestion drafted to take into account amount of ammonia N as influenced by feed composition – to be elaborated to include effects of additives and housing technology
- Anaerobic digestion – crediting methane production
 - Reference to existing recommendations in PEF work

Water use

The main issue discussed is how to obtain a better regionalization in inventories and impact modelling.

Existing models scrutinized to shed light on the best compromise between scientifically robustness and feasibility for practitioners

The way forward still to be decided

Biodiversity

At present biodiversity *per se* is not included in the mandatory list of PEF impact categories. Impacts on biodiversity may be included in PEF as 'additional information' where relevant, but no specific method for doing this is given. However, even if not presented in PEF list of indicators, biodiversity as an area of protection exist in LCA models as an end-point indicator as impacted by among other global warming, other emissions and land use. How to combine new initiatives with this already existing (hidden) indicator?.

Activities includes

- Overview of different methods (JRC working on documents; includes both LCA aligned and non-LCA methods)
- A more detailed assessment of 8-9 LCA compatible methods by JRC as basis for the further discussion
- Presentations of different methodologies at MS meetings (it seems that models do exist that account for land(management) as well as landscape/land fragmentation impacts compatible with an LCA approach)

Data for farm related activities

Background

Impact of bio-based products is mainly occurring at the farm level. However, for processed products the EF methods are not specific on which farm data to capture and rely on in the assessment

Aim

Assess which primary data requirements are needed. It shall assess in which cases primary data is mandatory and must be collected, taking into account the costs this may imply.

Discussion

Overview of data that are available/collected already
Access to existing data from farms – ownership of data

Input from the Nordic NEF group re livestock systems has been presented (what we consider realistic in practical data sampling and what secondary data that are needed)

<http://norden.diva-portal.org/smash/get/diva2:1167275/FULLTEXT02.pdf>

Cross-cutting issues

Discussion on

- limit between ecosphere and techno sphere (soil generally considered as techno sphere but it is a policy goal to protect soil quality – how to adapt present methodology)
- Modelling land use change
- Evaluating/communicating impact of peat soil oxidation

Conclusion

AWG address really many issues

An overall aim is to enable that improved agricultural practices can be **(scientifically sound)** reflected in the modeling of emissions and the environmental footprint of foods and other bio-based products.

The results of the AWG is to produce input to the TAB and ultimately The Commission on how to improve the modelling of emissions occurring in the agricultural part of a PEF. A dilemma may occur between the best possible way of modelling in a certain situation and what is feasible across many countries and product chains.

Not all planned aspects may be progressed, but surely I think that the recommendations from the AWG will allow a better representation of emissions from the agricultural systems as impacted by farm management.