

Promilleafgiftsfonden for landbrug

GFLI “data-in” projects: Focus on Denmark

Alberto Maresca

SEGES Innovation P/S

Table of Contents

GFLI “data-in” projects: Focus on Denmark	1
Summary	1
Abbreviations	1
1. Introduction	2
2. Collection of activity data	3
2.1 Overall	3
2.2 Data collection in practice	4
2.3 Challenges	5
3. Conclusions	6
4. References	6

Summary

All projects that wish to contribute to the enrichment and update of the GFLI database shall follow the procedure outlined by the Global Feed LCA Institute (GFLI) for “data-in” projects. This document aims to provide an overview of the procedure and data requirements connected with GFLI “data-in” projects, while listing potential data sources that can be used for Danish datasets and potential challenges related to current limitations in scope of the GFLI database. This document is written as part of the project “Klimaaftryk på foderet”.

Abbreviations

EF: Environmental Footprint; GFLI: Global Feed LCA Institute; FAO: the Food and Agriculture Organization; IFA: International Fertilizer Association; PEF: Product Environmental Footprint; PEFCR: Product Environmental Footprint Category Rule.

1. Introduction

This document is written as part of the project “Klimaafttryk på foderet”, as an attempt to summarize some information of interest from the ‘GFLI methodology and project guidelines’ (GFLI: Global Feed LCA Institute; [1]), while indicating potential data sources that could be used during the generation of GFLI compatible datasets and highlighting potential challenges related to current limitations in scope of the GFLI database. This document cannot replace in any way the information contained in the guidelines, nor be considered a comprehensive summary. This document only focuses on selected topics.

All GFLI “data-in” projects, i.e. any project that wishes to contribute to the enrichment and update of the GFLI database, start with the definition of an adequate project outline that is developed in cooperation with the GFLI project manager and that is then approved by the GFLI Board before the project execution starts [2]. In general, and unless different agreements are being made, Blonk Consultants is responsible to calculate the emissions to air, water and soil, and carry out the impact assessment, while the institution initiating the GFLI “data-in” project is responsible for the data collection. All doubts and clarifications for data collectors must be taken with GFLI and Blonk Consultants (as this is a necessary step for any “data-in” project) – as it was done during this “Klimaafttryk på foderet” project.

At the European level, the “PEFCR Feed for food-producing animals” (PEFCR: Product Environmental Footprint Category Rule; [3]) defines specific rules on how the impacts of compound feed produced in a feed mill should be calculated, while also providing guidelines on how to calculate the impacts from single feed materials products (although this is not the focus of the PEFCR feed). Within the PEFCR feed, the evaluation of the impacts of specific feed ingredients via secondary data is possible via the Environmental Footprint (EF) database. This source of data is always the preferred option recommended by the PEFCR feed, but it may not contain all the wished datasets. Missing datasets can be retrieved from the GFLI database (detailed instructions can be found in the PEFCR feed [3]). As such, the GFLI database is a central reference point, especially because it is expected to expand rapidly and get frequent updates. Furthermore, the GFLI database is available in both a Microsoft Excel file and a SimaPro importable file, making it relatively practical – also for non-LCA experts. On the other hand, the EF database has to either be consulted via a specific LCA software (e.g. SimaPro, OpenLCA and GaBi) or via the individual data provider nodes [4]. The Danish feed industry is currently in the process of implementing the PEFCR feed guidelines.

One of the aims of the “Klimaafttryk på foderet” project is to establish a “data-in” project, focusing on a few Danish feed ingredients relevant for the Danish livestock systems, namely the cattle and the pig sectors.

Both the GFLI database and the EF database, as well as the background LCA databases that they are based on (e.g. Ecoinvent, Agri-footprint, ...), are in continuous developments. In a similar way, there are ongoing methodological developments in the two systems. The current document refers to latest available versions:

GFLI database (version: March '21), with its accompanying ‘GFLI methodology and project guidelines’ [1], and data collection spreadsheets (i.e. *Crop collection template for GFLI - Version 1.1 (20-5-2021).xlsx*, *Processing template for GFLI - Version 1.0.xlsx*)

2. Collection of activity data

2.1 Overall

'The GFLI methodology and project guidelines' [1] define how to carry out the collection of data in the case of "crop cultivation" (e.g. grass cultivation) and "crop processing" (for example the wet and dry milling of grains, the pressing and crushing of oil seeds and beans, or the sugar production), and depending on whether the specific product is be classified as sectoral, regional or branded product. The classification sectoral, regional or branded products sets specific requirement on where primary data should be used. Along with the collection of activity data describing the process of interest, every activity data should be evaluated for its "technological representativeness", "geographical representativeness", "time-related representativeness" and "precision" using a data quality evaluation matrix. This matrix resembles the matrix used in the PEF CR feed [3], but with some adaptations.

GFLI "data-in" projects are classified as either regional, sectoral or branded, depending on the focus of the specific project (/dataset). The "Klimaaftryk på foderet" project focuses on regional and sectoral datasets, and Table 1 summarizes the (general) minimal requirements for data collection in terms of primary and secondary data.

To support the data collection process, the company initiating the GFLI "data-in" project receives two data collection templates that must be filled-out (i.e. *Crop collection template for GFLI - Version 1.1 (20-5-2021).xlsx*, *Processing template for GFLI - Version 1.0.xlsx*). The templates support the collection of data with regards to the cultivation of crops, and to the processing of feeds. The templates contain the entire list of activities, for which data must be collected. Along with the collection of (primary and secondary) activity data, every datapoint entered in the template has to be characterized by its source and data representativeness (according to the data quality evaluation matrix) – more details can be found in the 'The GFLI methodology and project guidelines' [1] and in the excel files.

GFLI distinguishes three main approaches depending on the type of source data used to describe the individual parameters: the specific approach, the semi-specific approach and the default approach. The type of approach should be consistent with Table 1, in terms of minimum requirements (note that the specific approach often implies the collection of primary data).

In general, the collected data should be representative of a recent 3 to 5 year of cultivation (or factory) operations, e.g. in terms of yields, synthetic and organic fertilizers, liming materials and prices of main- and co-products, regardless of whether the data is based on primary or secondary sources This is done to offset fluctuations due to seasonal differences.

Table 1. Minimal requirements for deriving regional and sectoral datasets (copy from ‘The GFLI methodology and project guidelines’ [1]).

Stages		Regional CROP/ Fisheries	Regional PROCES SED product (1 step)	Regional PROCES SED More steps	Sectoral CROP / fisheries	Sectoral PROCES SED product (1 step)	Sectoral PROCES SED More steps
Cultivation/ fishing	Cultivation activity data	SECIMPROVED	SECDefault	SECDefault	PRIMARY	SECDefault	SECDefault
	Production of inputs	SECDefault	SECDefault	SECDefault	SECDefault	SECDefault	SECDefault
Transport	Market mix & Logistics		SECIMPROVED	SECDefault		SECIMPROVED	SECDefault
Animal farm	Farm activity data		SECIMPROVED	SECDefault		SECIMPROVED	SECDefault
	Production of inputs		SECDefault	SECDefault		SECDefault	SECDefault
Transport	Farm prod. mix & Logistics		SECIMPROVED	SECDefault		SECIMPROVED	SECIMPROVED
Primary processing	Processing activity data		SECIMPROVED	SECDefault		PRIMARY	PRIMARY
	Production of inputs		SECDefault	SECDefault		SECDefault	SECDefault
Transport	Product Mix & Logistics			SECIMPROVED			SECIMPROVED
Secondary processing	Processing activity data			SECIMPROVED			PRIMARY
	Production of inputs			SECDefault			SECDefault

2.2 Data collection in practice

As Table 1 shows, the use of “default” and “improved” secondary data is accepted in many of the value-chain processes, depending on the focus of the dataset.

With regards to the generation of dataset describing the cultivation of crops in Denmark, during the “Klimaaftryk på foderet” project, we identified a series of potential data sources:

- ❖ *Statistikbanken* [5]:
 - Database owned by Danmarks Statistik, containing annual historical data for Denmark
 - data: e.g. crop yields (straw yield – HALM1), prices of a few crops (LPRIS10), cultivation area (“Det dyrkede areal”)
- ❖ *FarmTracking* [6] and *MarkOnline* [7]:
 - software owned by SEGES Innovation and used by the farmer to plan and register field operations. The data contained in these databases represent primary data.
 - data: e.g. amounts and type of fertilizers, pesticides and liming materials, amount of diesel, yields, etc....

- ❖ *Tal om kvæg* [8]
 - database owned by SEGES Innovation
 - data: e.g. dry matter and nutrient content, based on annual lab-analyses
- ❖ *Farmtal Online* [9]
 - database owned by SEGES Innovation
 - data: e.g. estimations of prices of some main- and co-products, electricity consumption, diesel consumption and amounts of irrigated water
- ❖ *SEGES investigations*
 - data: e.g. national averages on amount of liming materials used [10]
- ❖ *FAOstat* [11]
 - database owned by The Food and Agriculture Organization (FAO), containing annual historical data for (nearly) all countries in the world
 - data: e.g. crop yields (main product), cultivation area, cultivated area under organic soils, country imports and exports
- ❖ *IFASTAT* [12]
 - Database owned by the International Fertilizer Association (IFA)
 - data: e.g. amounts and type of fertilizers consumed, at a country level
- ❖ *GFLI default*
 - GFLI provides a series of potential default secondary data that can be used in the lack of more specific ones.
 - data: e.g. dry matter, energy contents and prices of main- and co-products, fertilizer amounts and energy uses for some crops and countries, average application rates of manure at a country level, amounts of seeds used per crop [13]

With regards to the processing of feed, Table 1 shows that the minimal requirements vary depending on whether the focus is “regional” or “sectoral”. The differentiation between regional and sectoral is not very clear within the current ‘GFLI methodology and project guidelines’ [1], but assuming that the “Klimaaftryk på foderet” project is likely to have a “sectoral” focus for many of the processed feeds (for example, the pressing the rapeseed grains in order generate (rapeseed) oil and (rapeseed) expeller), then the collection of primary data from the operating factories will be needed. As for all other cases, the data will need to be representative for a recent period of 3 to 5 years, and assessed for its representativeness (according to the data quality evaluation matrix).

2.3 Challenges

Overall, the current ‘GFLI methodology and project guidelines’ [1] are very descriptive in the case of crop cultivation and their data collection requirements, but they are not in the case of crop processing – meaning that specific clarifications should be taken with GFLI and Blonk, as part of the “data-in” project.

The guidelines for “branded” datasets are under pilot testing, and it can be expected that they will be available within the near future. Therefore, at the moment, it is not yet possible to generate branded datasets.

The current GFLI database does not yet include roughages, and the possibility to include them in the upcoming update is under discussion. Given that roughages are an essential part of cattle feed, the current impacts of cattle feed cannot be purely based on GLFI. Data on cultivation of roughages is generally scarce worldwide, which makes the generation of representative dataset challenging. In Denmark, however, the availability of data is relatively good, and the “Klimaaftryk på foderet” project

aims to generate a few roughages datasets following the GLFI guidelines, regardless of whether these are to be included within the near future in the GLFI database.

As for now, the GLFI database does not contain any organic product, and the upcoming database update is not going to contain them either. In this regard, it is noteworthy that the PEFCR Feed does not explicitly mention neither conventional production systems nor organic production systems [3], but the current EF database contains food and feed products from both production systems – suggesting that the PEF methodology [14], and related PEFCRs, are also applicable to organic systems. At present, no publicly available explanations could be retrieved for the lack of organic datasets in the GLFI database. It could be speculated whether one of the reasons for the absence of organic products is the zero-(upstream) burden approach used for manure (and possibly other byproducts too), as the organic crop and animal production systems are more interconnected and dependent on each other. On the other hand, it should be also noted that, at present, there is a generalized lack of background LCA datasets able to describe the impacts of products used in organic production systems; this means that the current modelling of organic production systems could translate into cutting-out the impacts of some of the used products because of no background data availability. However, these are pure speculations, and further clarifications should be taken with GLFI. In Denmark, the productions of feed and livestock under organic production systems are not negligible, and there is a general need to know the impacts of feed ingredients to assess the impacts on livestock. To support this need, the “Klimaaftryk på foderet” project may aim to generate a few organic feed datasets following the GLFI guidelines, regardless of whether these are to be included within the near future in the GLFI database.

3. Conclusions

Clear guidelines on how to contribute to the enrichment and update of the GLFI database are available, and they all start with the definition and acceptance of a GLFI “data-in” project. Specific data requirements have to be met, when collecting data. While the minimum requirements vary depending on the focus of the dataset (i.e. national, sectoral or branded), the collected data always needs to be representative of a few recent years of operation (namely cultivation or processing). All data sources should be reported, and an assessment of the individual data points quality must be carried out.

4. References

- [1] GLFI, “GLFI methodology and project guidelines. 28 October 2020. The Global Feed LCA Institute,” 2020.
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 - [13] The Global Feed LCA Institute (GFLI), "GFLI spreadsheets for data collection." 2021.
 - [14] European Commission, "ANNEXES 1 to 2. Commission recommendation of 16.12.2021 on the use of the Environmental Footprint methods to measure and communicate the life cycle environmental performance of products and organisations," 2021.