# WFLDB phase 3.

## Methodological guidelines v.3.9

# Critical Review Report

Reviewer: Assumpció Antón

7th November, 2023

## BACKGROUND

World Food LCA Database (WFLDB) project led by Quantis was launched in 2012. The aim of the WFLDB is the database development of life-cycle inventories (LCIs) for the food sector. In 2016 Quantis launched WFLDB-Phase 2. Currently, they are developing WFLDB-Phase 3 (2020-2023), which will comprise 4200 datasets including different crops, dairy products and food processes, as well as supporting datasets. All of them representative for diverse geographies. WFLDB-Phase 3 also involves an updating of methodological guidelines covered by the version 3.9.

The current document presents the report resultant from the external review of the WFLDB-Phase 3 datasets, which follow updated methods of version 3.9. The review process includes the review of WFLDB Methodological Guidelines version 3.9 and a selection of Phase 3 datasets modelled according to that Guidelines version 3.9.

## OBJECTIVE

Main goal of this review is to ensure the conformity of information covered in the new datasets to be used in LCA studies. This main goal have been split into four specific goals: i) to check compliance of methodological guidelines' documentation with ISO14'040, ISO 14'044. Special focus is devoted to corresponding updates of the methodology v 3.9; ii) to confirm completeness, transparency and correction of LCI modelling; iii) to test out emission calculations according to updated methodology and iv) to verify judgement of the scored quality criteria.

## REVIEW PROCESS

To meet these objectives, the review process has followed next steps:

1. Revision of the documentation, WFLDB methodological guidelines, WFLDB documentation report and its excel appendix and sLUC documentation report to verify that:
    a. Methods are appropriate to be applied in the preparation of life cycle food inventories
    b. Methods respond to the latest scientific methodological updates
    c. Methods are clearly explained to be followed by LCA practitioners
2. Review of selected thirty datasets. Twenty were selected by the reviewer among the new crops and ten recommended by Quantis to ensure coverage of processed products. Although randomly selected, there have been some constraints to ensure coverage of different geographic conditions and different types of crops. Following aspects have been considered during the revision:
    a. Activity Description
        - Representativeness of the information of the corresponding dataset is complete, transparent and sufficiently clear
        - Information sources are clearly identified.
    b. Exchanges: Flows from Technosphere
        - Checking correctness of amount pointed
        - Suitability of the flows selected and their corresponding background
    c. Exchanges: Flows from and to Biosphere
        - Suitability of models applied according to guidelines version 3.9
        - Correction of the calculations

3. Preparation of review deliverables and discussion meetings with Quantis

   a. A preliminary draft was submitted on 31 August 2023, where general comments about findings, doubts and more urgent requests for a change regarding methodological aspects were suggested. Two type of requirements were defined: Essential requirements and Worthwhile ones. Corresponding names indicated urgency of them.

   b. Excel file document, which compiles specific and detailed comments for the documents reviewed, as well as the corresponding reviewed DATASETS. The Excel file has been organized into three sheet as follows:

      - **GUIDELINES 3.9**, which includes specific comments for the WFLDB methodological guidelines version 3.9, submitted on 31 August 2023.
      - **ANNEXES** containing the comments for auxiliar material such as Documentation and s-LUC documents, submitted on 31/08.
      - **DATASETS** that incorporates the comments for the selected datasets reviewed. Sent on 8/09 (18 datasets reviewed) and 18/09 (12 datasets reviewed).

   The Excel file have been used to provide feedback from Quantis (sent on 30/09) and final agreement by the reviewer (30/10). Specific discussion meetings between reviewer and Quantis Team have been organized to deepen on those required aspects (27/07, 28/08, 20/09, 25/10).

   c. List of **DATASETS** reviewed

1 Almond, shelled, at farm /US U
2 Avocado, at farm /MX U
3 Carrot, at farm /ES U
4 Coffee, cherry (Arabica), at farm /GT U
5 Coffee, cherry, (Robusta) at farm /VN U
6 Cotton, at farm /MX U
7 Maize grain, at farm /BR U
8 Maize grain, at farm /FR U
9 Mango, at farm /ES U
10 Paddy rice, at farm /IT U
11 Paddy rice, at farm /PK U
12 Pear, at farm /CL U
13 Potato, at farm /ES U
14 Potato, at farm /US U
15 Rapeseed, at farm /DE U
16 Rose, at farm /MX U
17 Soybean, at farm /BR U
18 Soybean, at farm /IT U
19 Wheat grain, at farm /PL U
20 Zucchini, at farm /BR U
21 Palm fruit bunch, RSPO /ID
22 Palm fruit bunch, non-RSPO /ID
23 Palm oil, crude, RSPO certified, at oil mill /ID
24 Maize germ oil, crude, at oil mill /FR
25 Maize starch, wet, wet milling process, at plant /BR U
26 Mango juice, from concentrate, 13° Brix, at plant /RER
27 High fructose corn syrup F55 (HFCS-55), at plant /MX
28 Macadamia nut shelling, at plant /ZA
29 Sugarcane, at farm, subtropical region, with intercropping and biomass burning /IN
30 Sugarcane, at farm, subtropical region, without intercropping and biomass burning /IN

# CONCLUSIONS

There is no doubt that we are facing a work that we can affirm is in coherent and advanced line of construction of agricultural and food datasets, on the other hand highly needed for LCA studies.

New datasets are compliant with methodological guidelines v 3.9. During the review process several aspects have been presented, discussed and addressed correctly. For those, which had been defined as critical, satisfactory improvements have been done, these could be listed as:

- Completeness and clarity improvement of Methodological Guidelines v 3.9 and annexe documentation with updated crop modelling methods and clear differentiation with previous versions.
- Clear identification of corresponding version of the different datasets.
- Inclusion of limitation and use of data section to safeguard suitable utilization by users.
- Correction of the different specific bugs and mistakes founds.

In addition, as fruit of the revision and meeting discussions, several aspects, currently listed at the limitation section of the WFLDB Methodological guidelines v 3.9, have been agreed to be addressed in future updates. Among them I would highlight:

- Revision of the Data quality criteria and uncertainty assessment applied.
- Better regionalization of parameters related to climate and soil definitions.
- Continuous updating modelling and background information when possible.
- Revising previous dataset versions to ensure methodological homogeneity among the different datasets.

Finally, it is necessary to remark that this review has been conducted to ensure coherence of the new methodological version 3.9. It does not include a detailed revision of the 4200 datasets of WFLDB Phase 3.

The latest version of Excel with corresponding comments and feedbacks is included as an annex.

Assumpció Antón

Barcelona, November 7th 2023