Flexible, efficient and consistent agricultural inventory modelling with SALCA

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Introduction

Agricultural systems strongly rely on the use of natural resources, with highly variable impacts and numerous farms. A specific framework, versatile methods and efficient tools are thus needed to adequately assess the environmental impacts of agricultural systems.

Objective: Present the completely revised Swiss Agricultural Life Cycle Assessment (SALCA) method.

Methodology

SALCA operates at four organisational levels (Fig. 1) and has a modular structure, allowing to manage complexity and to exchange models (Fig. 2). The models exchange intermediate results, which ensures consistency. Fig. 3 and 4 present two examples of SALCA models.
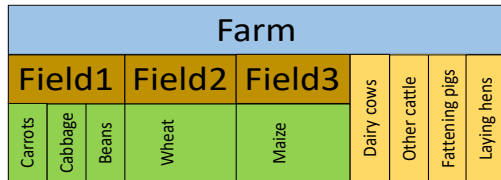

Fig. 1: Four levels of organisation of SALCA.

Results and discussion

Application of SALCA:
- crops and cropping systems
- animal husbandry and animal products
- food and feed products
- farms and product groups
- agrifood sector and food systems
- LCI databases.

Strengths:
- comprehensiveness
- specificity to agriculture
- harmonisation
- broad applicability
- consistency
- comparability
- flexibility
- modularity.

The application of SALCA is limited to experts and the geographical scope is Central and Western Europe. Adaptation to other contexts is feasible with reasonable effort.

Conclusions

SALCA enables answering a wide range of research questions related to environmental assessment and is applicable in different contexts.
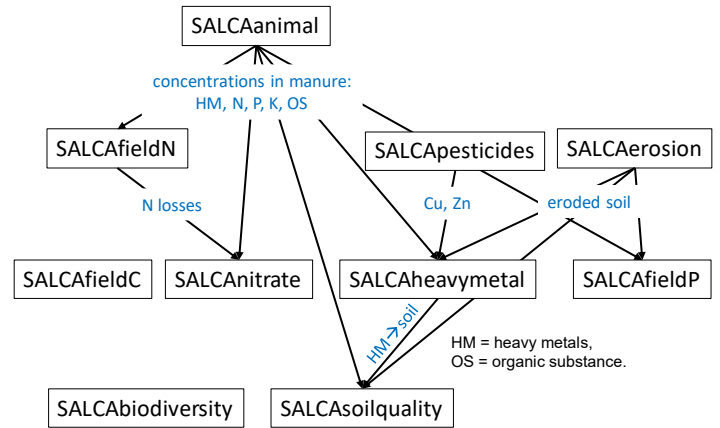

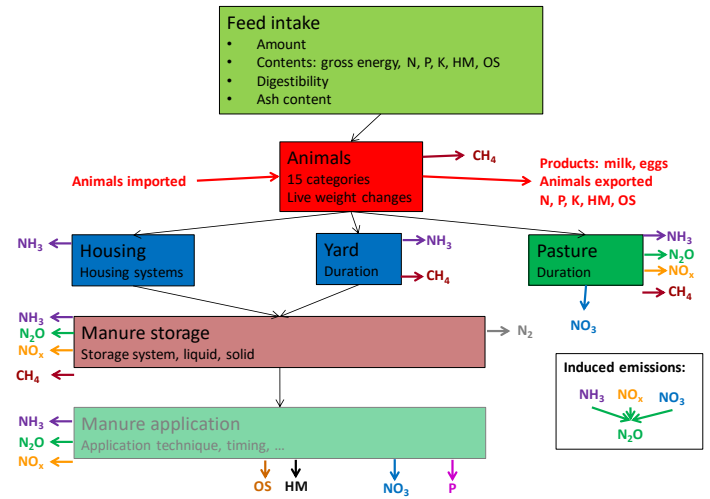Fig. 2. Data flow among the SALCA models.

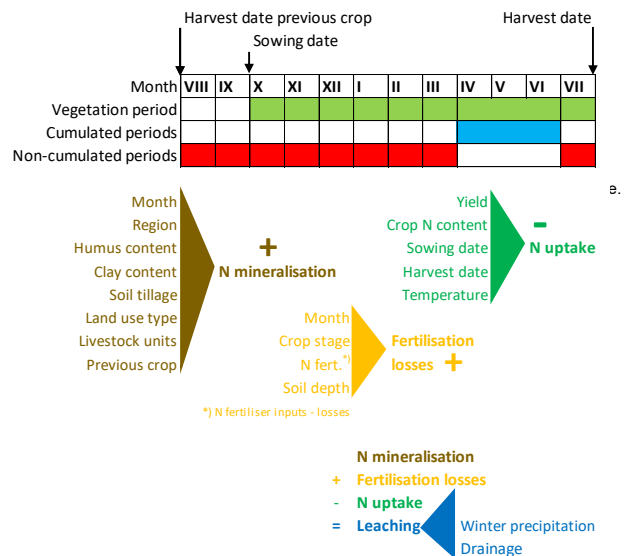Fig. 3. Flows and emissions for animal husbandry (SALCAanimal).

Fig. 4. SALCAnitrate emission model.

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