MEANS, a user-friendly software platform for multi-criteria assessment of agricultural products

Julie Auberger, Caroline Malnoë, Lucille Chanel, Vincent Colomb, Geneviève Gésan-Guiziou, Hayo van der Werf, Joël Aubin

LCM 2017, 3 - 6 September 2017 – Luxembourg, Luxembourg
8th International Conference on Life Cycle Management

A platform to assess impacts of agri-food systems

Why?

- Agriculture is one of the main drivers of environmental impacts: GHG emissions, nitrogen and phosphorus emissions, biodiversity loss, water consumption (Foley et al. 2011)
- Environmental improvement of agri-food systems requires assessing their impacts

How?

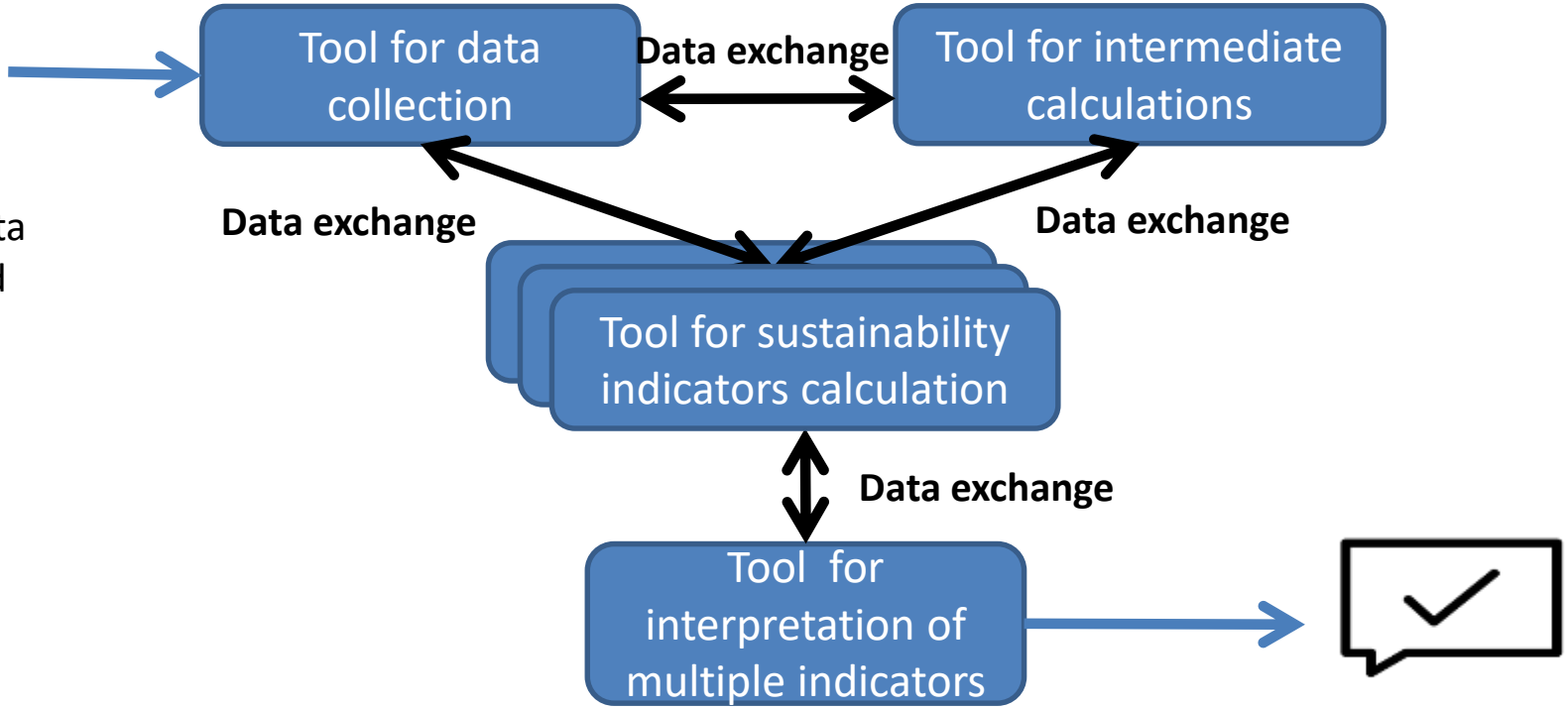
- INRA is developing the MEANS platform, dedicated to multi-criteria sustainability assessment of agri-food systems
- MEANS development is supported by ADEME (French environment agency).

MEANS platform objectives

- **Facilitate multi-criteria assessment of agri-food systems for non-specialist practitioners**
- **Capitalize and share research resources for multi-criteria assessment**
  - Data: characteristics of inputs, technical management of agri-food systems
  - Models: models to estimate pollution flows and resource use
  - Methods for multi-criteria assessment,
    - for environmental, economic and social

Goal: provide a complete tool set for assessing sustainability of agri-food systems

User, with data about studied systems



MEANS platform today

- **MEANS is operational for environmental assessment within the framework of Life Cycle Assessment (LCA)**

- **MEANS-InOut:**
  - User-friendly tool to generate Life Cycle Inventories (LCI)
  - Dedicated to French agricultural production at the farm gate
  - Web application, available online
  - Available to any user after purchasing a license.

✓ Available since January 2017

Out: software for foregroun

Including a reference data set for inputs of agricultural systems: fertilizers, livestock feed, etc.

Nitrate, ammonia, phosphorus, pesticides, land occupation, water use, etc.

User, with data about studied systems

Tool for data collection : forms

Data exchange

Tool for intermediate calculations : models to estimate direct emissions and resource use

Data exchange

Data exchange

Tool for impact assessment

Input lists and models adapted to French agricultural systems and conditions

MEANS-InOut features

Modeling in MEANS-InOut is based on AGRIBALYSE methodology

- System boundaries
- Inputs and outputs considered
- Models for direct emissions and resources consumption
- Allocation among co-products…

AGRIBALYSE methodology (Koch and Salou, 2016)

- Results from a consensus among the main stakeholders of the French agricultural value chain
- Agrees with international recommendations (ISO, ILCD)
- Intended as the standard methodology for performing LCA of agricultural products in France.

Calculate impact indicators

- A LCA software is required
- MEANS-InOut has export features

MEANS-InOut

Users data:
- Collected (inputs)
- Calculated (emissions, resources consumption)

MEANS-InOut mapping of inputs (background data):
- ecoinvent v3.1 LCI
- AGRIBALYSE v1.3 LCI

LCI in EcoSpold format, ready to be imported into SimaPro

Format compatibility with openLCA under study

Why use MEANS-InOut?

Like other tools MEANS-InOut

- Is adapted to needs of agri-food modeler
- Ensures that user do not forget any matter or energy flows
- Requires only foreground data.

MEANS-InOut has unique features

- Can be used for plant and/or animal production
- Gives details of emission and resource use calculations (transparency)
- Provides the same methodology for every productions (consistency)
- Remains independent of economic interests.

Sharing data in MEANS-InOut

- **Users are invited to share their finalized data with the MEANS community**
  - To enlarge the MEANS database of system descriptions
- **Quality management and data review systems**
  - Under development
  - To ensure that shared data is reliable and can be reused or adapted by other users.

Perspectives

Current developments

- Model to estimate water footprint
- Adaptation of forms to collect metadata for quality management and to calculate uncertainties.

Future developments

- Integration of food processing systems.

Conclusion

MEANS platform provides a user-friendly tool to

- Generate LCIs of agricultural production following international guidelines
- Share data describing agricultural systems.

MEANS platform

- Is a collaborative project
- Scientific collaborations are welcome
  - Supplement methods for environmental assessment
  - Integrate methods for economic or social assessment
- Aims to create a community.

Discover the use of MEANS-InOut for free for 18 days

Any questions?

Julie.Auberger@inra.fr

www.inra.fr/means_eng/