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SYNERGY: A model to assess the economic and environmental impacts of increasing regional protein self-sufficiency



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« Territory Economical, the Right Understanding »



Introduction

The European Union relies on imports to feed livestock
 ➔ the 2014 CAP aims at improving protein self-sufficiency for feed by developing the production of legumes

Objective

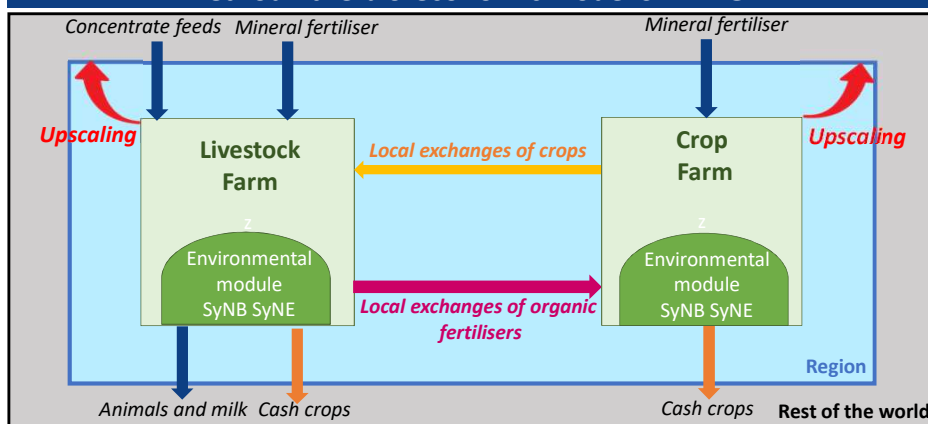
To implement a bio-economic model **assessing environmental and economic impacts** of increased protein self-sufficiency through legume development

Main hypothesis

Complementarity among farms represents a lever to increase protein self-sufficiency at regional level through local exchanges

➔ Local exchanges of organic fertilisers and crops between farms

Method : the bio-economic model SYNERGY



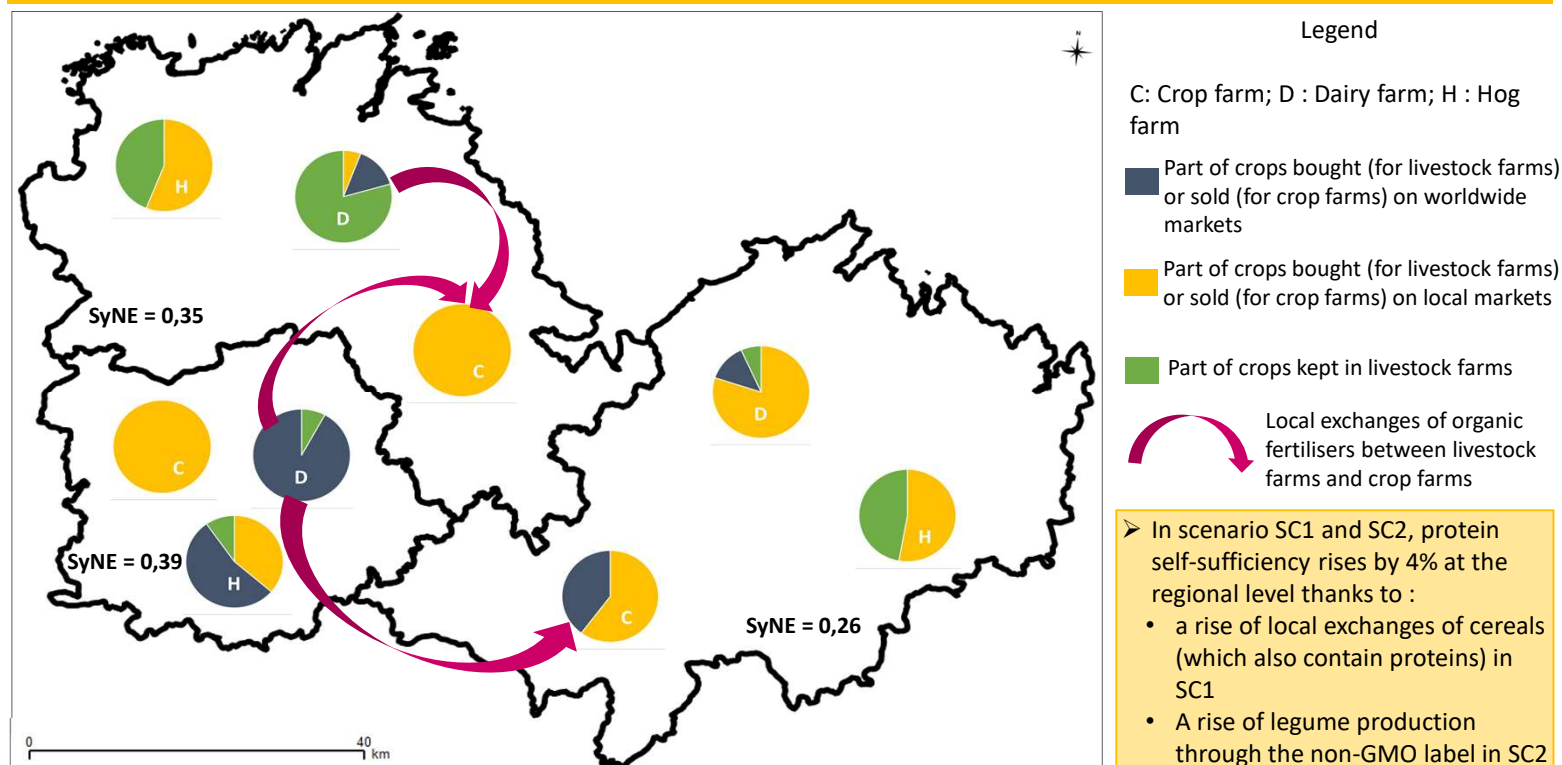
Distinctive features

- Optimization model (maximizing regional income)
- Different types of farms : dairy, hog and crop farms
- Exchanges of crops and organic fertilisers
- 3 types of outputs at farm and regional levels:
 - Assessment of protein self-sufficiency in feed
 - Economic assessment
 - Environmental assessment
- 3 scenarios
 - Baseline (B)
 - With local exchanges (SC1)
 - With local exchanges and certification on GMO-free products (SC2)
- N-related indicators based on (Godinot et al., 2014)
 - SyNE (System N Efficiency)
 - SyNB (System N Balance)

Data

Different types of data are used to build the model:
 Public statistics (2013-2017); Technical Institutes (IDELE, IFIP); Extension services in Brittany; COMIFER

Preliminary Results



Stylized representation of the outlets of crops (in tons) in farms simulated by SYNERGY in the scenario SC2 in a region of Western France (Côtes d'Armor). Exchanges between livestock farms are not represented