

2017

UMR1302 SMART-LERECO

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Key figures for 2017

- 37 research and academic staff
- including 14 accredited PhD supervisors
- 16 assistants, technicians and administrative staff
- 14 PhD students
- 41 scientific articles in peer-reviewed journals
- 1 research and expert assessment report
- 1 PhD defended
- 12 working papers
- 16 scientific seminars

SMART-LERECO Joint Research Unit

Research Highlights

The **SMART-LERECO** Joint Research Unit (UMR) was established on 1 January 2017, joining the scientific forces of the INRA–Agrocampus Ouest Joint Research Unit on “Agricultural and Market Structures, Resources and Territories” (UMR SMART) based in Rennes and the INRA “Economic Research and Studies Laboratory” Research Unit (UR LERECO) based in Nantes. The new UMR has some 60 people on board, including around 30 researchers and faculty members, from INRA’s Social Science, Agriculture and Food, Rural Development and Environment (SAE2) Division (on the Rennes and Nantes sites) and Agrocampus-Ouest (on the Rennes and Angers sites).

Research Highlights looks back over the year’s main achievements in terms of research findings, participation in setting up research projects and programmes, decision-making assistance and knowledge transfer activities in our partnerships with academic research and higher education bodies and/or with public and private agriculture players (French ministries, European institutions, international organisations, professional agricultural organisations, etc.).

Research support

Sustainability and evaluation indicators

There is a growing need for data on sustainability in agriculture for industrial, research and public policymaking requirements, especially for the evaluation of the Common Agricultural Policy (CAP). The European Farm Level Indicators for New Topics in Policy Evaluation (FLINT) research project was conducted from 2014 to 2016 precisely to **define indicators that could help improve policy evaluation in terms of impact on farm sustainability**. The indicators defined by the project were collected from nearly 1,100 pilot farms in nine European countries by combining the farms’ accounting, economic, environmental and social information. SMART-LERECO worked on different phases of the project, including leading the analyses of the resulting data.

Find out more:

<http://www.flint-fp7.eu/>

Latruffe L. *et al.* (2016). Measurement of sustainability in agriculture: a review of indicators. *Studies in Agricultural Economics* 118: 123-130.

Contact: laure.latruffe@inra.fr

Research findings

Consequential LCA of livestock farming

Consequential life cycle assessment (LCA) is a modelling approach for capturing environmental impacts of production system changes, taking into account induced market effects. A SMART-LERECO thesis co-funded by the French Environment and Energy Management Agency (ADEME) adopted a combined economic and environmental sciences approach to conduct **a consequential LCA of changes in livestock farming in France and the rest of the European Union**. The environmental impacts of removing dairy quotas and introducing a grass premium were assessed, on the basis of a range of environmental criteria, taking into account both the production redistribution and substitution among livestock systems and the resulting technological change and land-use change dynamics.

Find out more:

Salou T. (2017). Combiner Analyse du Cycle de Vie et modèles économiques pour l’évaluation *ex-ante* d’instruments de politiques publiques. *AGRO CAMPUS OUEST thesis*, 263 p.

Salou T. *et al.* (2017). Could EU dairy quota removal favour some dairy production systems over others? *Agricultural Systems* 153: 1-10.

Contact: chantal.le-mouel@inra.fr

Research findings

Food firm export performances

Whereas the trade literature generally assumes that firms export their products directly to consumers, new studies are pointing up the role of intermediaries in international trade. In France, intermediaries represent 18% of food product exporting firms, but more importantly 36% of exported volumes. The study conducted here shows that **acquiring an intermediary reduces the cost of exporting and boosts export values**. In addition, the study shows that forward integration lowers prices and distribution costs, and reveals that the benefits from forward acquisitions can be quite large.

Find out more:

Gagné C., Latouche K., Turolla S. (2018). Vertical Ownership and Export Performance: Evidence from the Food Industry. *American Journal of Agricultural Economics* 100(1): 46-72.

Contact: stephane.turolla@inra.fr

Research support

Carbon sequestration

In response to the gradual disappearance of hedgerows in the West despite actions to save them and the fact that carbon storage by hedges is not traded in France on the existing carbon markets, a project entitled “Towards rural carbon neutrality: a multisector approach to improve carbon sequestration by agricultural agroforestry and hedgerow systems” (CARBOCAGE) has set out to **develop a voluntary local carbon market to make hedgerow carbon storage pay**. Funded by the French Environment and Energy Management Agency (ADEME) and coordinated by the Loire Regional Chamber of Agriculture, the project will work with local Grand Ouest chambers, the O2M sustainable development consultancy firm and research units from ESA Angers, AGROCAMPUS OUEST and INRA, including SMART-LERECO, through to its completion in 2020.

Contact: thomas.coisnon@agrocampus-ouest.fr

Decision-making assistance

Soil artificialization

INRA and the French Institute of Science and Technology for Transport, Development and Networks (IFSTTAR) conducted a joint scientific expert assessment commissioned by the French ecology and agriculture ministries and ADEME on **the social, economic and environmental determinants and impacts of soil artificialization**. The purpose of the assessment was to define courses of action to better contain this phenomenon, which is EU land enemy number one. SMART-LERECO’s contribution focused on identifying all the determinants of suburban real estate construction and their impacts on the forms of urbanisation produced. In particular, building on new land in suburban areas can result in the fragmentation of urban units of low population density separated by natural and agricultural spaces, potentially generating negative effects on the environment.

Find out more:

Coisnon T., Oueslati W., (2017). Les dynamiques foncières et immobilières de la couronne périurbaine déterminent la construction sur de nouvelles terres. *Rapport de l’Expertise scientifique collective « Artificialisation des sols, déterminants, impacts et leviers d’action »*.

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Knowledge transfer

A book on setting up in farming

This book tracks the development of the “approved installation pathway” scheme for future farmers through to its current workings and its strengths and weaknesses. The book analyses the governance system that would-be farmers have to contend with wherein divides are created between two farming models – one called “business” and the other family. The author proposes **courses of action to turn the “approved installation pathway” back into a real tool to assist farmers with their different ambitions driven by the public’s wants and needs**.

Find out more:

Giorgis D., Pech M. (2017). S’installer en agriculture. Pour un véritable accompagnement des paysans de demain. *Editions Charles Léopold Mayer*.

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Research support

Farm value and farm transfer

The “Farm value and farm transfer: perspectives from economics and sociology” (FARM_VALUE) project, funded by the French National Research Agency (ANR), was launched on 1 January 2017 for a period of four years to **provide new perspectives to farm stakeholders and policymakers on farm transfers**. It focuses mainly on the role of the farm’s value in this process, taking a multidisciplinary economics and sociological approach.

Find out more:

Jeanneaux P., Desjeux Y., Enjolras G., Latruffe L. (2017). Farm value evaluation: Methods and challenges. *Presentation to the 21st IFMA Congress, Edinburgh, United Kingdom, 2-7 July*.

Contact: laure.latruffe@inra.fr

Research findings

Food, transport and greenhouse gas emissions

Although interest is growing in food systems that support local supply and shorter distribution channels, **eating local does not necessarily minimise agricultural product transport emissions**. The findings of the model developed by SMART-LERECO serve to stipulate the conditions in which local supply is compatible with the minimisation of total emissions and show that it is nonetheless preferable to import part of the food supply in those regions with the largest urban populations. From a strictly environmental point of view, the heterogeneity of production conditions could hence justify sourcing from distant regions where production is sufficiently more efficient and/or lower-carbon. The analysis also focuses on another less well-documented mechanism driving growth in needs for farmland around towns and cities.

Find out more:

De Cara S., Fournier A., Gaigné C. (2017). Local food, urbanization, and transport-related greenhouse gas emissions. *Journal of Regional Science* 57(1): 75-108.

Contact: carl.gaigne@inra.fr

Research findings

Acceptability of agricultural biotechnology

The future development of agricultural products produced by the new biotechnologies is highly dependent on their acceptability. The Eurobarometers conducted on behalf of the European Commission are potentially useful sources for measuring this acceptability, but a suitable statistical method needs to be developed to reduce their biases and interpretation problems. The research conducted here evidences **a downward trend in acceptability with age and greater acceptability of “cisgenesis”, i.e. intra-species gene transfer**, while finding clear differences between European countries due to the way in which the national public debate is structured.

Find out more:

Rousselière D., Rousselière S. (2017). Decomposing the effects of time on social acceptability of biotechnology using Age-Period-Cohort-Country models, *Public Understanding of Science* 26(6): 650–670.

Rousselière D., Rousselière S. (2017). Is biotechnology (more) acceptable when it enables a reduction in phyto-sanitary treatments? A European comparison of the acceptability of transgenesis and cisgenesis, *PLOS ONE* 12(9): e0183213.

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Research findings

Trade openness and economic growth

The literature tends to show that more open countries reach higher economic growth in the long run. However, a number of studies present limitations regarding both how trade openness is measured and the estimation methods used, that make their findings debatable. The research conducted here proposes a more comprehensive measurement of trade openness taking into account the quality and variety of exports. It shows that whereas countries exporting higher-quality products and a wider range of varieties exhibit higher growth, **trade openness can have a negative impact on the growth of countries specialized in low-quality products.**

Find out more:

Huchet-Bourdon M., Le Mouël, C., Vijil M. (2018), The relationship between trade openness and economic growth: Some new insights on the openness measurement issue. *The World Economy* 41(1): 59-76.

Contact: marilyne.huchet@agrocampus-ouest.fr

Decision-making assistance

Statistical definition of cooperatives

At the request of the International Labour Organization (ILO), several members of SMART-LERECO took part in drafting a preparatory report for the 2018 International Conference of Labour Statisticians. The report details **the methodological and conceptual issues regarding the identification and classification of cooperatives**, including discussion of the cooperative sector's core components and boundary areas. It presents the issues surrounding the identification of the cooperatives' members (active/inactive, multi-stakeholder membership, etc.), employment (employees, self-employed, etc.) and economic contribution (value-added, impact, etc.). A conceptual framework is consequently proposed to define, classify and measure cooperatives.

Find out more:

<http://www.copac.coop/conceptual-framework-for-the-purpose-of-measurement-of-cooperatives-and-its-operationalization/>
<http://www.copac.coop/copac-technical-working-group-meets-to-discuss-path-towards-improved-cooperative-statistics/>

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Knowledge transfer

Model improvements

The Joint Research Centre (JRC) chose SMART-LERECO researchers for their expertise in dynamic crop rotation choice modeling to conduct a feasibility study on **including crop rotation effects in the European Commission's IFM-CAP model**, a tool designed to assess the EU-wide economic and environmental effects of the Common Agricultural Policy. This model can currently determine farmers' crop production choices in different economic and political contexts, but the constraints imposed rule out consideration of the effects of rotation, which impact on these choices.

Find out more:

Carpentier A., Gohin A. (2015). On the economic theory of crop rotations: value of the crop rotation effects and implications on acreage choice modeling. *SMART-LERECO Working Paper* No. 15-04.

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Research support

Livestock sector competitiveness

The "Competitiveness of the French livestock sectors" (COMPANI) project was launched in July 2017 for a period of 16 months **to provide new insights on the competitiveness of the French livestock sectors and identify courses of action that could drive an upturn in these sectors' performances.** The French livestock sectors are struggling to maintain their market share on French and international markets, with a sharp drop registered in France's weight in EU exports of animal produce since 2000. The trends observed in the last 20 years will be put into perspective by measuring indicators of the different dimensions of price competitiveness and non-price competitiveness and studying internal and external business competitiveness factors.

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Research support

Farm setting up and transfer

SMART-LERECO held two conferences in Angers and Rennes in 2016-2017 in partnership with Coop de France on the topic of **farm transfers and the setting up of young farmers in cooperatives**. Two issues were addressed: first on urban sprawl and second on the value of farms and their financing methods. In addition to the presentation of recent research findings, these conferences heard accounts from cooperative stakeholders relating their experience on the ground of technical, economic and financial assistance with current changes. A total of 180 participants discussed their points of view, debated the strengths and weaknesses of the schemes and opportunities and brakes on support to the setting up of farms, and discussed the role of agricultural cooperation.

Find out more:

T. Coisnon, Y. Desjeux, S. Duvaleix-Tréguer, L. Latruffe, M. Pech and L. Piet (2018). *Cahiers du Développement Coopératif* n°3.

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Research findings

International cattle trade

International trade in beef is growing in response to the increase in global beef consumption and production difficulties in many countries. The research here uses global and EU customs data to propose **an analysis of developments in the productive and trade situation for major world and European beef sector players from 2000 to 2015**. Although flows of live cattle and beef are found to be high between EU Member States, the EU remains a modest world market player in terms of both imports and exports.

Find out more:

Chatellier V. (2017). Les échanges de bovins vivants et de viande bovine dans le monde et dans l'Union Européenne. *INRA Productions Animales* 30(3): 199-218.

Contact: vincent.chatellier@inra.fr

Decision-making assistance

The French National Food Conference

Held from July to December 2017, **the French National Food Conference public debates and consultations saw contributions from several members of SMART-LERECO**, either speaking directly themselves or indirectly through co-authors. Presented studies covered the economic organisation of the agricultural sectors, the role of labels, certification and major retailers in food industry export performances, farmers' investments and their determinants, and competitive strategies in the retail sector.

Find out more:

<http://www.egalimentation.gouv.fr/>

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Knowledge transfer

Research replicability

Technical efficiency is a component of competitiveness, and knowing the determinants of this efficiency enables policies to be developed to improve competitiveness. **Contributing to the replicability of analyses and the dissemination of methodological developments**, the 'sfadv' package developed by SMART-LERECO for the R software provides users with codes to replicate an original method designed to evaluate the determinants of the technical efficiency of decision-making units, whether farms or other firms, taking into account input endogeneity.

Find out more:

<https://CRAN.R-project.org/package=sfadv>

Desjeux Y., Latruffe L. (2017). 'sfadv': Advanced methods for stochastic frontier analysis. *R package version 1.0.1*.

Latruffe L. *et al.* (2017). Subsidies and technical efficiency in agriculture: Evidence from European dairy farms. *American Journal of Agricultural Economics* 99(3): 783-799.

Contact: yann.desjeux@inra.fr

Decision-making assistance

Livestock farming roles, services and impacts

Several members of SMART-LERECO contributed to a joint scientific expert assessment on European livestock farming systems and their products conducted by INRA at the request of the French ecology and agriculture ministries and ADEME. This expert assessment drew on an international bibliographical summary to address **the multiple repercussions of the production and consumption of products of animal origin on ecosystems and the climate, labour and employment, the markets and the main social and cultural considerations**. The possible courses of action that could be taken to increase the sustainability of livestock farming were identified by the relations between the different impacts and services in the main European livestock farming areas.

Find out more:

Dumont B., Dupraz P. (coords.) *et al.* (2017). *Rôles, services et impacts de l'élevage en Europe. Synthèse de l'Expertise scientifique collective*.

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Research findings

Land price and the environment

The price of land observed in a **land transaction contains important information on the many values that agents assign to the resource, in particular its natural attributes**. Given that land price analysis is a combination of socioeconomic and environmental approaches, a typology of the empirical literature on the subject identifies the strengths and weaknesses of the studies conducted to date in order to determine future avenues of research and steer the development of policy recommendations.

Find out more:

Ay J.-S., Latruffe L. (2016). The informational content of land price and its relevance for environmental issues. *International Review of Environmental and Resource Economics* 10(3-4): 183-226.

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Research support

Creation of the STRATège Joint Technological Unit

The French Ministry for Agriculture and Food accredited the STRATège Joint Technological Unit in January 2017 for a five-year term. The unit is an association of the French Technical Institute of Horticulture (ASTREDHOR), AGROCAMPUS OUEST, INRA and the University of Angers. Its brief is to **develop multidisciplinary collaborative research in ecophysiology, agronomy, genetics, marketing and economics to stimulate the horticultural sector** by advancing the adaptation of plant products to the growing urban horticultural market.

Find out more:

<http://www.inra.fr/umt-strategie/>

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