The Impact of Research on EU Agriculture

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The IMPRESA *Project: Implications for Agricultural Knowledge and Innovation Systems*

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SCAR AKIS Group Meeting

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IMPRESA's Main Messages

- The changing profile of agricultural research
- The complex pathways by which research impact is achieved
- The value of public support for agricultural research and the important role of innovation intermediaries in its success

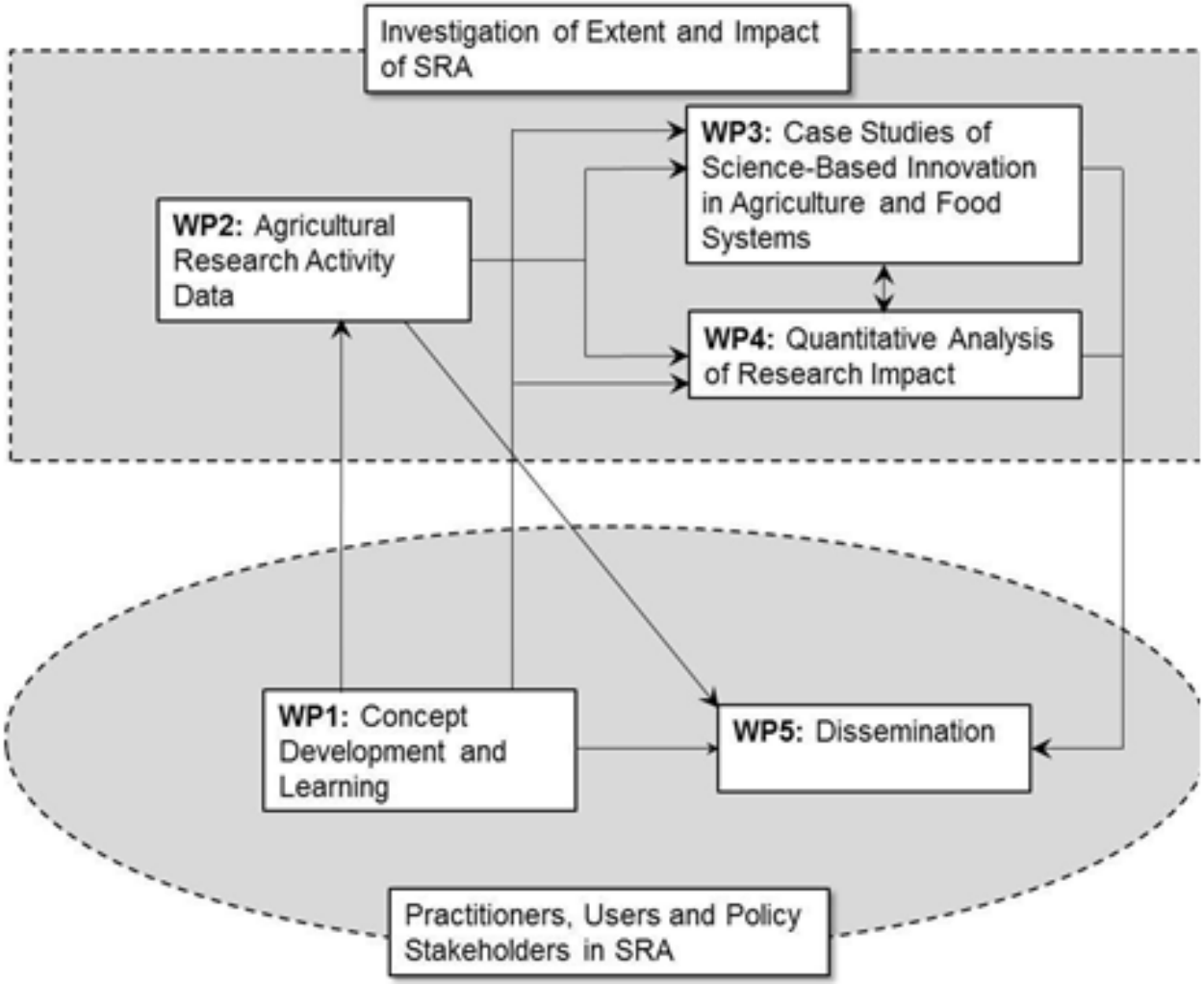
Outline

- A reminder: what IMPRESA aims to achieve
- The main messages of the project
- A focus on quantitative results
- Key lessons from case study inquiry
- Implications for research monitoring and evaluation
- Making these messages stick …

IMPRESA's Objectives

- Describe the contemporary evolution of public and private agricultural research
- Survey trends, sources and objectives of agricultural research in EU and EEA countries
- Perform econometric analysis and input-output modelling on the effect of research on agricultural productivity
- Use regional case studies to investigate individual research-based innovations
- Communicate results to national governments and other stakeholders

IMPRESA Organogram



Cross-Scale Quantitative Analysis

- Agricultural research impacts on productivity
- Adjustment for social and environmental policy objectives
- Sectoral and national spill-overs of technical change
- Private R&D and agri-food company level performance
- Farm level technology uptake

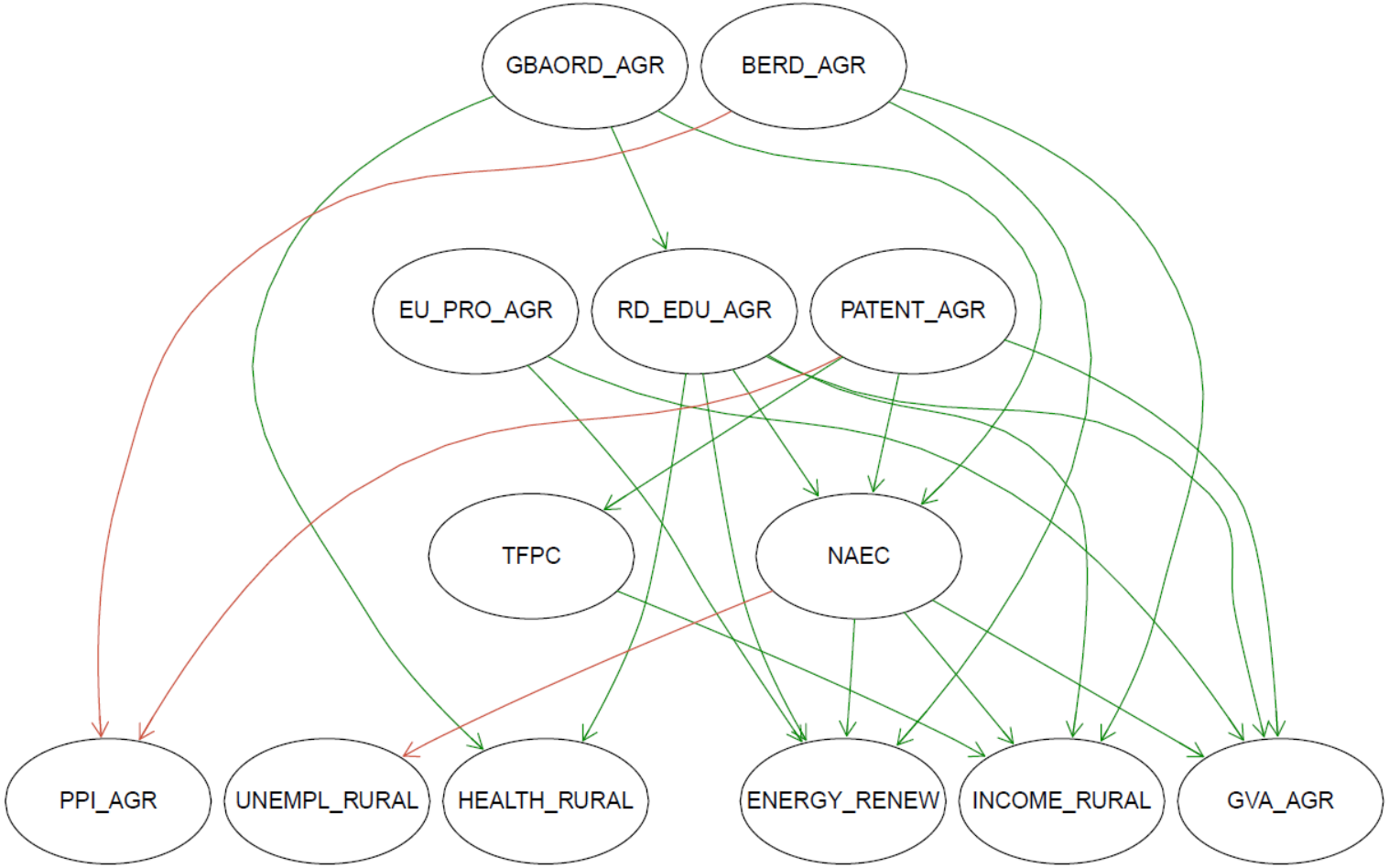
The Impact of Research on Productivity: National Level Analysis

- Approach
- Limitations
- Main result: European public agricultural research expenditure contributes significantly to productivity increase
  - internal rates of return are between 7 and 15%
  - time lag of research effect on productivity is around 9 years

Returns to Research Expenditure on Environmental-adjusted Productivity

- Is the effect of research on environmental variables transmitted through productivity?
- Structural Equation Modelling:
  - testing direct effects of research expenditure on multiple dimensions
  - Distributed-Lag Structural Equation Modelling (takes into account temporal delay in dependence relationships among variables)

Significant Causal Effects from DLSEM



Sectoral and National Spill-overs

- Use of Structural Decomposition Analysis
- Main insights
  - technical change in agriculture and food better than the overall economy average
  - food processing improves input-saving technical change to agriculture but *vice-versa* much less important
  - international transmission is largely insignificant
  - technical change is not as efficient as direct per unit reduction of environmental impacts

Corporate R&D and Food-processing Firm Performance

- Approach: Data Envelopment Analysis (DEA) using the S&P COMPUSTAT data set
- Major insights:
  - R&D has a positive effect on performance of firms by being associated with higher efficiency
  - Europe 2020 emphasis should go beyond the high-tech sectors and include food processing to leverage productivity and innovativeness

Micro-level Perspectives on Farm Technology Uptake

- Regional study of Emilia-Romagna
- Innovation adoption and assessment
  - Innovation is important for a large proportion of farms
  - Most frequent: mechanical innovations and water-energy saving
  - Research perceived as important but an indirect role for technology development and adoption
  - Adaptation of innovation to local conditions important
  - Need to explore co-existence and interplay among different innovations and innovation pathways

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Exploring Research Impact Pathways

- Comparative case study analysis
- Choice of approach
  - Innovation system theory
- Seven step method
  - Initial screening; stakeholder pathway building; pathway refinement; data collection; pathway evaluation; feedback round; conclusion
- Cases

Case Study Analysis: Conclusions for researchers

- Plan for impact at outset of research design
- Involve key stakeholders (including private sector) at early stage
- Consider impacts in mid-term reviews
- Provide resources for “soft factors”
- Carefully consider participatory methods
- Enrol researchers into a “culture of impact”
- Monitor research outputs with data collection tools and protocols at early stage

Case Study Analysis: Conclusions for Policymakers

- Engage key actors in research and innovation and experiment with their potential roles
- Strengthen agricultural advisory services as educators, knowledge hubs, innovation facilitators
- Coordinate and improve effectiveness of support instruments for capacity building and networking
- Include stakeholders in research programming and evaluation
- Strengthen availability and access to research data for assessment of impacts

Future Monitoring Implications

- Quantitative results: strengths and weaknesses
- From promises of impact to making impacts more likely, more timely, more extensive
  - The importance of recording, at overall and project level
  - Smarter ways of incentivising researchers (extensionists, and private companies and cooperatives)

Scope for Enhanced Dissemination

- Short Papers: Research and Policy Briefs
- Dissemination Conference: Rome, 4th November 2016
- The coincidence of IMPRESS
  - (Cirad: http://impress-impact-recherche.cirad.fr/)
- Mutual reinforcement of ideas and development of methods and tools
- Scope for joint working on dissemination and policy briefing

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Thank you for listening, questions?

More information at:

www.impresa-project.eu

ImpresS, a participatory method applied to a collection of 13 case studies

More information on the case studies: http://impress-impact-recherche.cirad.fr/

Main lessons of ImpresS

Two “hard facts” confirmed :

- Impact takes a long, very long time, to happen (20 years at least); it is not a good tool for research programming;

- in most cases, it is impossible to attribute an impact to research only, since it is a result of many complex interactions with different actors happening along the way.

Main results from cross cases analysis

- ImpresS participatory tools helped to identify a unexpectedly large diversity of impacts (+ or -) and to understand how research contributes to impact thru innovation

- Research impacts public policies (and reverse), even when we do not plan it

- The role of research is essential to generate outcomes through different types of interactions, in particular capacity strengthening. These outcomes become key resources to enable outputs use and generate different impact pathways.

- Research roles are very diverse along impact pathway but generally require interactions with other actors throughout the innovation process.

- For an institution like Cirad, the ultimate objective is to reinforce the culture of impact amongst its scientists and research teams, so they can better structure their interactions with the other actors in innovation process for development.