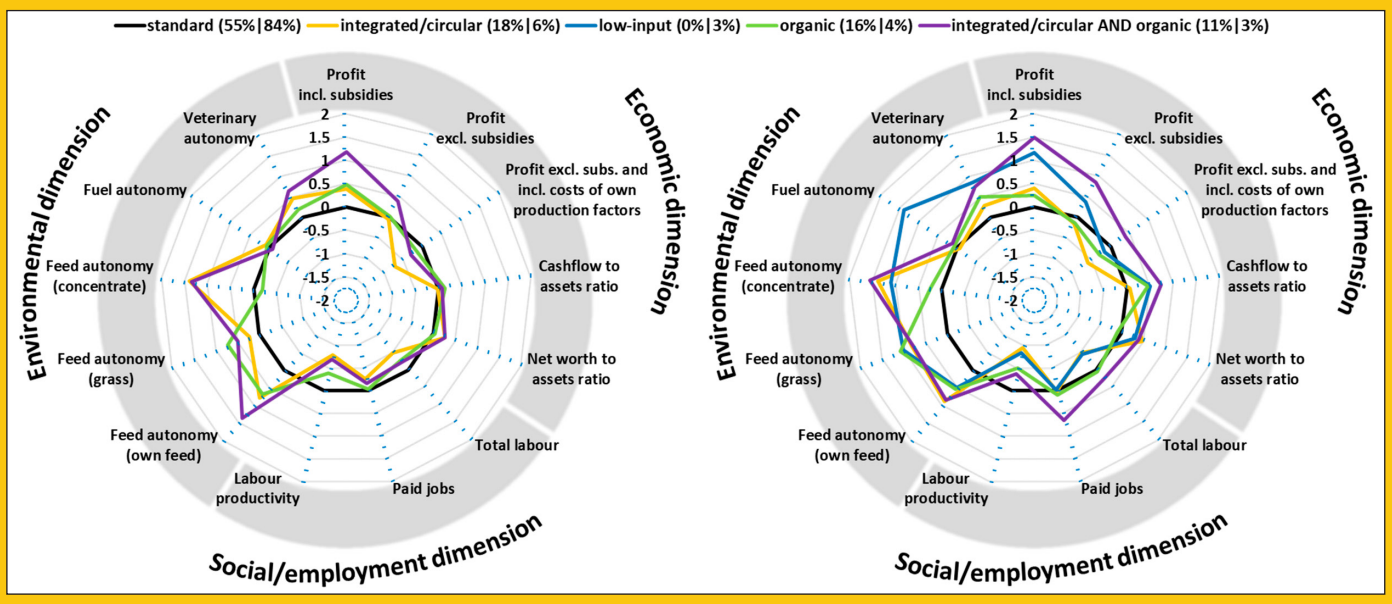
parlons graphiques

Andreas Niedermayr, Jan Landert, Fabrizio Albanito, Johannes Carolus, Yann Desjeux, Julia Heinrichs, Andrea Hrabalova, Philippe Jeanneaux, Jochen Kantelhardt, Laure Latruffe, Jürn Sanders, Lena Schaller and Gerald Schwarz

Assessing farming systems in transition to agroecology
Évaluer les systèmes agricoles en transition vers l'agroécologie
Bewertung landwirtschaftlicher Betriebe in agrarökologischer Transformation

In light of the high environmental ambitions of the European Union (EU), it is imperative to monitor and better understand the agroecological transition of EU agriculture and its effects on all sustainability dimensions in order to tap its full potential. Two H2020 research projects, LIFT and UNISECO, analysed the agroecological transition of farming systems in the EU. Both projects use ecological classification systems (typologies) and performance indicators to assess farms depending on their degree of implemented agroecological practices. Results are visualised with spider web diagrams to unveil synergies and trade-offs within and between economic, environmental and social sustainability dimensions. The two projects' approaches differ in terms of data requirements, scale and scope of indicators, but provide complementary insights. The LIFT approach is applicable to data from the Farm Accountancy Data Network (FADN), a representative sample of EU agriculture, focused on large-scale monitoring of farm income and business activities, but can also be used with further data sources and flexibly adjusted to different spatial scales (NUTS regions, countries, EU). The approach compares performance of farms in up to five ecological groups (conservation agriculture, low-input farming, integrated/circular farming, organic farming, agroecology) with a less ecological group, referred to as standard farming. This enables us to depict

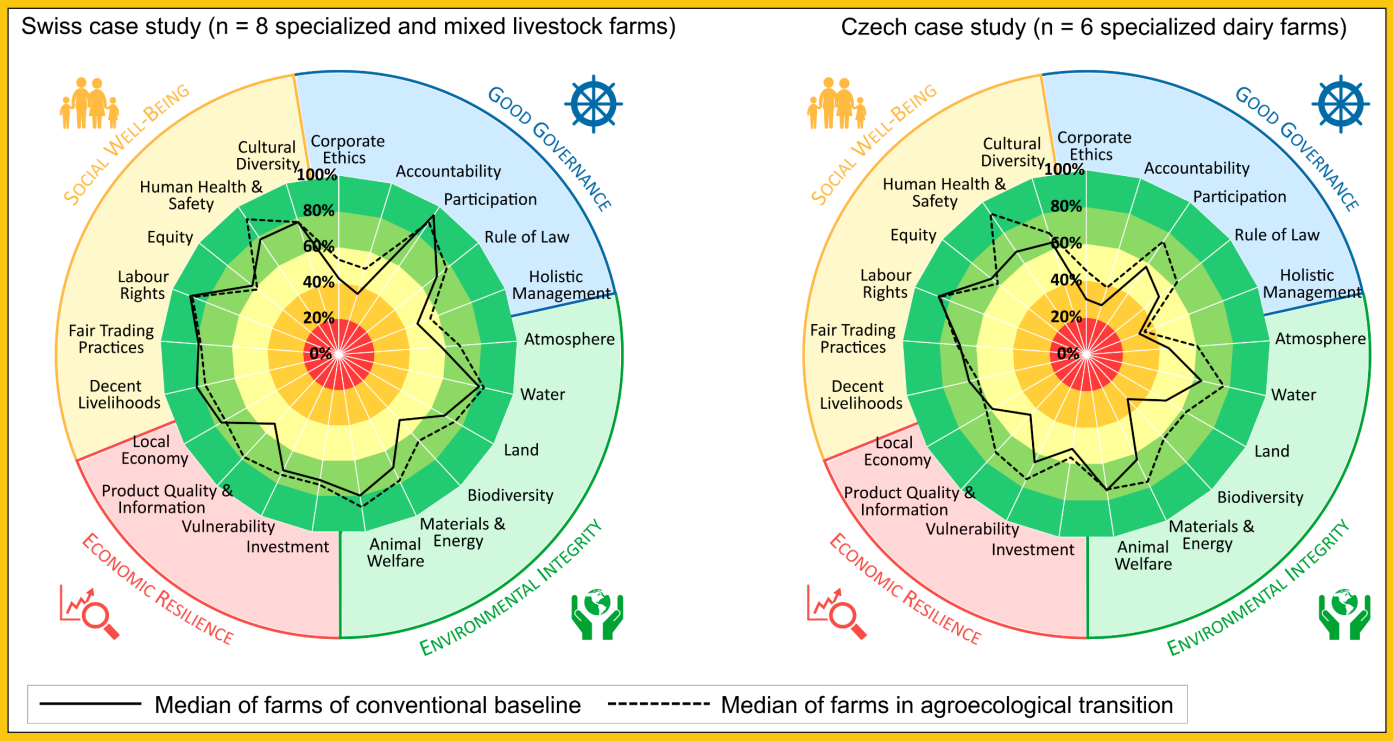
Figure 1: Example of overall sustainability performance of specialised dairy farms differentiated by degree of implemented agroecological practices in Austria (left, n = 787) and France (right, n = 1,005) based on FADN data from the year 2015 as calculated in the LIFT project. Percentages of farms in each group given in parentheses (Austria|France)



Note: *Performance of standard farms (black line) is normalised to zero and is the benchmark for ecological groups, so that values above/below the black line indicate better/worse performance.* Results of both countries show similar tendencies. Ecological groups tend to perform overall better in the environmental dimension and mostly worse in the social/employment dimension. In the economic dimension, differences in profitability depend on whether subsidies and opportunity costs of own production factors (own land, family labour, equity) are included or excluded.

DOI: 10.1111/1746-692X.12359

Figure 2: Example of SMART farm tool for overall sustainability performance ratings of farms in two case study regions for the year 2018[1] representing different degrees of implemented agroecological practices, resulting from the UNISECO project.



Note: [1]For reasons of data availability, the reference year was 2017 in case of two Swiss farms.

whether ecological farms perform differently and have different trade-offs and synergies than less ecological farms. Figure 1 shows two such examples based on Austrian and French dairy farms in order to illustrate the approach.

In UNISECO, sustainability assessment tools were applied in 15 case studies across Europe. Among them is the SMART Farm Tool. It is based on the guidelines for the Sustainability Assessment of Food and Agriculture Systems (SAFA) from the FAO and covers a wide range of topics with over 300 indicators. Figure 2 shows the aggregated SMART results from two case studies. While the grouping of farms was based on a common typology combining FADN farm production systems with a classification of agroecological practices, transition pathways differed according to the local farming contexts. Due to the detailed coverage of numerous aspects by SMART, the assessments contributed to the understanding of the reasons behind trade-offs on farms in a wide range of different farming contexts. However, compared to the approach in LIFT, assessments with SMART require the collection of new empirical farm data. The approaches developed in LIFT and UNISECO show what can be done with existing FADN data, and where further indicators are needed, particularly in the environmental and social sustainability dimensions. Besides fostering the sustainability of European farming, these insights contribute to the evolution from FADN to a Farm Sustainability Data Network (FSDN).

Further Reading

- Landert *et al.* (2020). Assessing agro-ecological practices using a combination of three sustainability assessment tools. *Journal of Sustainable and Organic Agricultural Systems*, **70**(2):129–144. https://doi.org/10.3220/LBF1612794225000.
- Niedermayr *et al.* (2022). Farm level sustainability of ecological farming. *LIFT Deliverable* **5**.1. https://doi.org/10.5281/zenodo.6416184.

Andreas Niedermayr, University of Natural Resources and Life Sciences, Department of Economics and Social Sciences, Institute of Agricultural and Forestry Economics, Vienna, Austria.
Email: a.niedermayr@boku.ac.at

Jan Landert, Research Institute of Organic Agriculture FiBL, Frick, Switzerland.
Email: jan.landert@fibl.org

Fabrizio Albanito, School of Biological Science, University of Aberdeen, UK.
Email: f.albanif@abdn.ac.uk

Johannes Carolus, Thünen-Institute of Farm Economics, Braunschweig, Germany.
Email: johannes.carolus@posteo.de

Yann Desjeux, INRAE, Bordeaux School of Economics, Univ. Bordeaux, Pessac, France.
Email: yann.desjeux@inrae.fr

Julia Heinrichs, Institute for Food and Resource Economics, University of Bonn, Germany.
Email: julia.heinrichs@ilr.uni-bonn.de

Andrea Hrabalova, Bioinstitut - Institute for Organic Agriculture and Sustainable Landscape Management, Olomouc, Czechia.
Email: ahrabalova@email.cz

Philippe Jeanneaux, VetAgro Sup, Université Clermont Auvergne, AgroParisTech, INRAE, UMR Territoires, Lempdes, France.
Email: philippe.jeanneaux@vetagro-sup.fr

Jochen Kantelhardt, University of Natural Resources and Life Sciences, Department of Economics and Social Sciences, Institute of Agricultural and Forestry Economics, Vienna, Austria.
Email: jochen.kantelhardt@boku.ac.at

Laure Latruffe, INRAE, Bordeaux School of Economics, Univ. Bordeaux, Pessac, France.
Email: laure.latruffe@inrae.fr

Jürn Sanders, Research Institute of Organic Agriculture FiBL, Frick, Switzerland.
Email: juern.sanders@fibl.org

Lena Schaller, University of Natural Resources and Life Sciences, Vienna, Austria.
Email: lena.schaller@boku.ac.at

Gerald Schwarz, Thünen-Institute of Farm Economics, Braunschweig, Germany.
Email: gerald.schwarz@thuenen.de

Acknowledgements

LIFT ('Low-Input Farming and Territories – Integrating knowledge for improving ecosystem based farming') received funding from the European Union's H2020 research and innovation programme under grant agreement No 770747 (https://www.lift-h2020.eu/).

UNISECO ('Understanding & improving the sustainability of agroecological farming systems in the EU') received funding from the European Union's H2020 research and innovation programme under grant agreement No 773901 (https://uniseco-project.eu/).

Open access funding provided by University of Natural Resources and Life Sciences Vienna (BOKU).