

Report of the 29th Meeting of the OECD's Farm-Level Analysis Network (FLAN), virtual meeting, 14 March 2022

Participants

1. The meeting was attended by 60 participants and experts from 23 countries: Australia, Brazil, Canada, Chile, Czech Republic, Estonia, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Japan, Korea, Latvia, Mexico, Netherlands, Norway, Spain, United Kingdom and the United States, and from the European Union. Participants are contact persons from ministries and research institutions, nominated by their delegation, and invited experts.

Content and structure of the meeting

2. The objectives of the 29th meeting were to initiate a dialogue between users of different surveys and micro data to share their experiences and ideas on methodological and policy analysis addressing the “**Synergies and gaps between farm- and firm-level data**”; and to discuss first results on the work on characterising resilience.

- i. The meeting was divided into two sessions. The first part of the first session focused on **Experiences analyzing agricultural and rural policies using farm and business surveys**.
 - ii. The second part of the first session focused on **Opportunities and challenges to enhance micro analysis of agriculture and rural**.
 - iii. The second session included a presentation on the latest results from the work on **characterizing resilience**, discussed in the previous meeting in October 2021.
3. The agenda of the meeting, the list of participants, the presentations, and a background note are available on the network website: www.oecd.org/agriculture/farm-level-analysis-network/.

Introduction and welcome

4. **Jonathan Brooks** (*Agriculture and Resource Policies Division, TAD, OECD*), introduced the focus and objectives of this meeting and welcomed the presenters and participants. He highlighted the importance of considering how farm and firm-level datasets can be developed and broadened so as to be appropriate for monitoring progress against the SDGs: including indicators of resilience and sustainability that can be applied to provide a ‘granular view’. The OECD is seeking to open up a discussion on joining up farm and firm-level data and analysis; highlighting the linkages between these datasets, to better delineate and complement sector versus place-based policy domains.

5. **Enrique Garcilazo** (*Regional and Rural Policy Division, CFE, OECD*), discussed the work of OECD in supporting the working group of the *Regional Development Policy Committee*, to move towards a more micro-based analysis. This has strong connection with OECD’s *Agriculture and Resource Policies Division*, which covers agricultural data analysis. The *Regional Development Policy Committee* have a particular interest in tracking economic diversification in rural places, e.g. farms moving into processing which allows added value beyond the function of agricultural production alone. This team is pursuing 3 thematic projects: i) enhancing rural innovation; ii) enhancing the future of rural manufacturing and iii) improving service delivery. They work a lot with the terminology of space, but it is also interesting to consider what we mean by ‘place’. OECD has seen 3 different definitions of ‘rural’ over time:

- i. First, rural regions are defined by ‘predominantly rural’ or not, at the Territorial level 3 (TL3);
- ii. Second, moving to a definition by reference to the metro-centres, with 5 levels of increasing rurality;
- iii. Third, working by ‘degrees of urbanisation’, which is linked to a definition originally developed by the European Union (EU), and has also been adopted by the United Nations (UN).

Session 1: Synergies and gaps between farm- and firm-level data

Part 1: Experiences analyzing agricultural and rural policies using farm and business surveys **(Chair: Masayasu Asai)**

6. **Masayasu Asai** (*Trade and Agriculture Directorate - TAD, OECD*), introduced the agenda of the meeting, and the focus of the first session. He introduced the speakers of the first session, and the following questions that the speakers aimed to address:

- Which different types of surveys and micro data can be used for agriculture and rural analysis?
- Which questions can be analysed with farm survey data? Which issues or aspects cannot?
- Which questions can be analysed with business survey data? Which issues or aspects cannot?

7. **Amr Khafagy** (*Countryside and Community Research Institute - CCRI, University of Gloucestershire, UK*), presented an introductory note on synergies and gaps between farm and firm-level data. He discussed the importance of having high-quality microdata for assessing and understanding the socio-economic and environmental performance of the agriculture sector and rural areas. He highlighted the synergies and complementarities between farm and non-farm micro-level data that could be exploited to enhance our analysis of agricultural and rural development. He focused on three different surveys according to their population targets: farms, business and households. He presented the currently available cross-country and longitudinal micro-level datasets in the EU in these three domains: The Farm Accountancy Data Network (FADN), the Competitiveness Research Network (CompNet), and the European Union Statistics on Income and Living Conditions (EU-SILC).

8. Farm- and firm-level datasets provide extensive information on production, including production inputs and outputs, as well as energy consumption (in monetary values). Farm (FADN) and firm (CompNet) datasets include similar economic indicators that are sufficient for productivity measurements at the territorial level. However, social and environmental indicators are still under-represented in both datasets. Data covering social indicators could be extracted from the households’ survey (EU-SILC), which reports data on income, poverty, social exclusion and living conditions. Social indicators could also be extracted from the Farm Structure Surveys (FSS), which is collected every 3 or 4 years through a sample survey, and as a census each ten years. However, Environmental information is yet to be well-covered in microdata, and there are a number of challenges that restrict our ability to exploit available data, such as: i) defining rural regions, and identifying common indicators for social and environmental performance for farm and non-farm businesses; ii) matching data units from different datasets; iii) dealing with multifunctional and/or multiple-site businesses; and iv) measuring rural value-chain and the trade between farm and non-farm businesses in rural areas.

9. **Q&A:** Questions covered the degree of heterogeneity among datasets within the EU, at country level. The datasets, which he had described, were cross-country ones that had standardised units across the whole EU, but also country specificities. There would undoubtedly be more variations in national level datasets. There is even some harmonisation now between EU and US datasets, with concordance rules that are agreed between parties e.g. for the innovation survey that she has worked on.

10. **Michelle Marshalian** (*Centre for Entrepreneurship, Regions and Cities - CFE, OECD*) presented her experience of using firm-level data analysis for rural policies. She discussed the challenge

of defining rural regions, and how the definition differs between countries, although the OECD seeks a harmonized approach. Large regions in the EU would be equivalent to States in the USA and in both contexts, the smallest units would be local government level. Many definitions include degrees of remoteness as a key indicator of rurality, considering proximity or ease of access to metropolitan centres. However, many different definitions are applied – even between different Ministries within the same country.

11. Territorial analysis allows one to examine the interlinkages in space but suffers from frequent problems, such as of small sample size and statistical weighting. Sample size is often challenging due to small areas, small firms and small sectors in rural spaces. In particular, very small sample sizes in surveys (e.g. below 5 observations in each aggregated cell) could not be reported in accordance with data anonymization and protection rules. Sector cover can be an issue for non-agricultural datasets, such as, mining and mineral extraction, which could be might be included within other sectors. Similarly, agriculture is frequently excluded or underreported, while other times, they may be included within other sectors. This happens even though agriculture and mineral extraction are major sectors in rural territories. It can also be difficult to assess supply chains using spatial datasets. Classification of sectors (and territories) varies over time. You need to choose priorities when aggregating.

12. In her work in Scotland, **Michelle** found that productivity growth was higher in rural and accessible regions compared with urban and remotely rural regions, primarily due to upgrading of infrastructure and other activities. We can examine territorial equality using Gini, and diversification of the economy. Some possibilities exist to overcome the small sample issues by accessing big data.

13. **Q&A** on how easy to link firms' data to farms and agriculture. **Michelle** feels there is a huge opportunity to match farm and firm data across datasets, but it requires overcoming legal barriers and making strategy priorities when working with the two merged datasets.

14. **Brent Hueth** (*Economic Research Service – ERS, USA*), presented his experience with farm- and firm-level data analysis in the USA. The US has a decentralised statistical system with different statistical authorities and data providers. USDA has lots of consistent farm-level data, and the *Economic Research Service (ERS)* have been working to explore linkages between farms and the wider economy. Previously the economic census overlooked support services for agriculture; this is now being added for 2022. Also, agricultural co-operatives were never previously noted as a specific form of farm-related business: they added this into the dataset in 2017.

15. A longitudinal frame is now being constructed in order to add 'agri-food business' data, within general business data surveys. Availability of micro-level data is essential to enable statistical users to aggregate microdata according to their desired aggregation or to construct different indicators that address different research questions. However, access to micro-level data remains a challenge. The ERS does not perceive the agricultural sector in isolation; they want to examine farms in their broader economic and social context and to understand their role in the local economy. For example, to understand the extent to which farms receive services from other farms.

16. **Hans Vrolijk** (*Wageningen Economic Research, Wageningen University, Netherlands*), presented his experience with broadening data needs in the Netherlands. His work covers broadening questions in many dimensions – other sustainability indicators, other income sources and other economic activities. E.g. the FLINT project involved the development of sustainability indicators and the data collection on more than 1,000 farms across the EU. One of the main areas of interest is the impact of off-farm incomes on farm viability and performance. Farming business get increasingly complex, there are new institutional forms of farming business, with multi-sites and group management of different sorts. Multi-site farms are now common in horticulture and intensive livestock, for instance: a firm may have farms spread across several different regions or even countries.

17. A further broadening data need is the role of primary production in the agri-food sector and the importance of the agri-food sector in the (regional) economy. The Dutch agri-food sector uses a lot of

non-Dutch agricultural imports, in the food chain, while the Dutch rural economy has a lot of non-farm businesses. For all of these reasons, it is important to broaden our indicators and datasets. What responses are possible? 1) add new elements to existing surveys, i.e. FADN – e.g. input use, wastes, greenhouse gases, other income sources and fiscal provisions, etc.; or 2) Merge datasets such as consumer price data and farm gate price data or SME income data with Farm income data; or 3) align data collection of farming sector with those of other economic activities; and 4) innovate use of data, such as from other registers and tax data.

18. **Q&A** on a consistent challenge of bias towards the HQ location of the business, in much data, rather than the dispersed ‘establishments’ in which the business activities actually occur. **Hans** noted that this depends on how easily you can separate the establishments in the data – sometimes it is not possible.

Part 2: Opportunities and challenges to enhance micro analysis of agriculture and rural (Chair: Jesús Antón)

19. **Jesús Antón** (*Trade and Agriculture Directorate - TAD, OECD*), welcomed the speakers of the roundtable, and introduced the focus of the discussion. The roundtable focused on **Opportunities and challenges to enhance micro analysis of agriculture and rural**, where the discussion aimed to address the following questions:

- Can farm and business data be crossed for the same rural areas? What additional insights can be obtained?
- Can business surveys complement information from farm surveys when analyzing agricultural policies? Which information: value added, food chains, services...?
- Can farm surveys complement business surveys on rural development issues? What additional insights can be obtained on the rural development of rural areas?
- What are the challenges and difficulties for using together or complementing each other?

20. **Johannes Sauer** (*Technical University of Munich, Germany*), discussed the importance of choosing the decision-making unit that you wish to focus upon. If we can work at the level of a spatial reference unit, for instance, we can link business data to labour datasets or other data on natural resources which are available at this level of resolution, but would not be meaningful at individual farm or firm level. It is also essential to start from theory to derive hypotheses concerning how farms and/or firms behave, for testing. Sustainability indices often lack the linkage to businesses because they are only measured spatially. Networks are of interest, for understanding innovation, as well as dynamics, for regional development. Panel data is often essential for policy analysis. It would be particularly interesting to be able to link tax data with farm data.

21. **Michelle Marshalian** (*CFE, OECD*), stressed on the importance of linking several datasets together, such as firm tax, employer-employee, and firm survey datasets. There are several challenges, such as the legal framework to access and process microdata, the loss of non-matched information, and discrepancies between datasets and their underlying causes.

22. **Lionel Cosnard** (*Ministry of Agriculture, France*), discussed his work in agglomeration effects in food chains, where economies of scale push firms towards co-location geographically of production and processing, but only if the opportunities for development are there. If processors are damaged by a shock, there can be big impacts on surrounding farms which can have a profound geographical impact. Environmental risks may also be greater, if all farms producing similar outputs are located close together in space. There is interest in examining the co-dynamics of farms, processors and input suppliers operating in similar places.

23. **Shingo Yoshida** (*Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries – PRIMAFF, Japan*), discussed the potential of accounting and environmental, social and corporate governance (ESG) evaluation practices for measuring rural development. He discussed the farm annual survey of Japan, and the similarity between it and the FADN of the EU and the Annual Agricultural Resource Management Survey (ARMS) of the US. He highlighted how farm survey provide detailed economic information, however, environmental and social data are currently unavailable at the farm-level. Importantly, they also need governance data on farms and firms to assess likely knowledge and application of this to farming. He emphasized the importance of corporate governance data for corporate valuation because only good governance can ensure the synergies between economic strategies and non-economic practices in agricultural firms.

24. **Serdal Ozusaglam** (*National Innovation Centre for Rural Enterprise - NICRE, Warwick University, UK*) shared his experience in collecting data from 180 apple producers in South Africa. He discussed how farms do not conform to the norms of firms, as they face challenges of accessibility and they have structural differences. It is difficult to collect data from remote farms, and there is socially desirable response bias. Survey design differences are needed too, for example, firms recognize the term ‘innovation’, whereas farms do not use this terminology even though they also innovate. Confirming **Serdal’s** experience, **Michelle** noted that farms do not identify themselves as innovators even though they do innovate.

25. **Maria Wishart** (*National Innovation Centre for Rural Enterprise - NICRE, Warwick University, UK*) shared her experience with designing a rural business survey that covers both, farm and firm businesses in the UK. She explained how questions need to be adjusted, as between firms and farms, such that products and outputs would be recorded differently, with agricultural descriptions being more specific e.g. with respect to the use of migrant labour, etc. There were 3 key learnings from her experience: 1) collect primary data from both farms and firms simultaneously at the same time; 2) prepare standardised questions for both, farms and firms, as well as different questions tailored towards farms only, to allow better comparison between farms and firms; 3) the survey findings revealed a relatively high percentage of farms that were diversified and engage in non-farm economic activities.

26. **David Freshwater** (*University of Kentucky, USA*), presented a summary and conclusion for the roundtable discussion. He illustrated that Part 1 of the workshop revealed a few lessons. Agricultural analysis relying on farm-level data seems to better reflect the aggregate or sector level situation, as it does not include small producers. Farm-level data gives more value to the 20% who produce 80% of the goods rather than the 80% who produce only 20% altogether. FADN does not cover small farms which account for most farmers and many who are pluriactive. A very large share of farm households comes from off-farm economic activities, which are not necessarily linked to agriculture. For example, farm households’ income could depend on professional jobs of the family members (academics, advisory services, or other specialisation or professions). Pluriactive farmers can be very significant regionally, meaning that we need to treat agriculture rather differently. On the other hand, surveys of firms tend to under-sample rural areas so they are not able to capture such nuances and diversification in the farm households’ incomes. He questions whether pluriactivity is a strategy for reducing risks (as in not putting all eggs in one basket), and therefore it could mean that farms that are pluriactive need less recourse to formal risk management strategies.

27. A major challenge in accessing data is that in many cases, we can only get one chance to ask the question. Accordingly, we have to pre-specify what we want to extract, before we have the chance to explore whether the data is in the form that we need or not. It is therefore not generally possible to do multiple analyses – e.g. to attempt many regressions – because in so doing, the outliers would become identifiable, which would breach the principle of anonymity in the data that we are using. **David** suggests that we do not have to always start from theory when interrogating data. Sometimes we need to try and let the data speak for itself, before we can identify a theory to match what we are observing.

28. **Jonathan Brooks** noted that there can be a dichotomy in farming between smaller and pluriactive farm businesses, and larger specialised ones, in many countries. How can we best match

these two datasets? Maybe the two groups have different performance with respect to sustainability. It is essential to capture both types of farms in surveys and data analysis. Sometimes it is also essential to do so in a spatial context, for instance when looking at farming's impact on a watershed, or within a local territory. Where agriculture is marginal, other sectors usually are as well. In most years, farms lose money but they stay in business. Pluriactive farms may indeed have an incentive to record a loss against the farm business, because then they can offset their profits from other activities against the loss from the farm, reducing their tax liability.

29. **Q&A:** Questions covered a due diligence system related to **Shingo's** presentation. One dilemma for policy is whether farms and SMEs should be within such a system, or not – can they afford to do it? Does this mean that processors have to perhaps take on due diligence on behalf of their farmer suppliers? Who ultimately bears the social, economic and environmental responsibility, in these circumstances?

Session 2: Characterisation of agricultural resilience

30. **Johannes Sauer** presented the findings of his recent work to measure the resilience of farms in response to climate-related shocks (floods and drought). His work used data for crop farms in the UK. He examines resilience using a preparedness index and the 3-type of resilience dynamics characteristics: absorption, adaptation and transformation; and examines the dynamics of farm responses to specific types of shock, specifically focusing on productivity responses. The aim is to develop measurement of these characteristics and, possible, a resilience index. Some data comes from FADN and some from additional surveys, while supplementary data were estimated based on previous research. The method is to pair shocked and control farms through a Propensity Score Matching (PSM) in combination with Difference-in-Difference (DID) (in the case of flood events) and time series as well as panel regression (in the case of drought events).

31. The results are not significant for one-off flood events, which occurred 3 times across the dataset – these appear to have no specific impact on farms' productivity; whereas for the drought, which happened once but for a sustained 2-year period, there is a clear trend towards resilience-building through productivity improvements in farms that were affected. The pattern suggests a lagged response, such that no adaptation takes place in year one but then significant adaptation and moves towards transformation occur, after that. There are lots of possibilities and challenges to model these things accurately.

32. **Q&A** on emissions and response strategies and the extent would it be possible to link weather data to the performance of farms.