Compiling new sustainability data on FADN farms in Slovenia: a small-scale feasibility study

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Abstract

The paper presents selected outcomes of a national project supporting the conversion of FADN (Farm Accountancy Data Network) to FSDN (Farm Sustainability Data Network) in Slovenia, involving the compilation of a limited amount of new farm-level sustainability data on a sample of real FADN farms. The aim was to test "FSDN-like" processes on real farms (data collection and compilation, data sharing, improving farm feedback report and advisory service, etc.) in the Slovenian context in order to provide concrete recommendations for the timely and comprehensive conversion to FSDN in Slovenia. An overall conclusion is that maintaining the *status quo* approach to data compilation after the conversion to FSDN (majority of data collection burden remaining on farms, weak or non-existent data sharing) would be very time consuming, expensive and endangering for the core FADN through lower willingness of the farmers to participate. Recommendations include proposals for significant systemic and organizational changes in the FADN/FSDN, significant strengthening of data sharing (interoperability of already existing databases), digitization and optimization of key processes, and training of data collectors, farm advisors and farmers.

INTRODUCTION

Conversion to FSDN (Farm Sustainability Data Network) is the most comprehensive change of FADN (Farm Accountancy Data Network) in history. While the FADN system was primarily focused on collecting micro-economic farm-level data, the conversion to FSDN means an extension to new farm sustainability topics, mainly environmental and social, which will allow for a more comprehensive assessment of the sustainability of agriculture at the level of agricultural holdings (Regulation 2023/2674, 2023). The FSDN comprises 42 new farm sustainability topics: 18 economic, 16 environmental and 8 social topics (Annex I of Regulation 2023/2674, 2023; Rossi, 2024). Altogether, 52 new FSDN variables have been added; the variables mostly represent groups of information (Annex VIII of Implementing Regulation No. 2024/2746, 2024).

Through this conversion the FADN/FSDN database, with a harmonised methodology for all European Union (EU) countries, further strengthens its position as the most important farm-level database for the assessment of farm sustainability, for supporting evidence-based policy creation and evaluation, as well as for the upgrading the farm advisory service (Strategic Dialogue on …, 2024; A Vision for Agriculture and Food, 2025). The ambition is also to develop "a voluntary benchmarking system for on-farm sustainability assessments" or an "on-farm Sustainability Compass", which could also help reduce administrative burdens for farmers through strengthened data sharing (A Vision for Agriculture and Food, 2025).

In this paper, we present selected outcomes of a national project, which was aimed at supporting the conversion of FADN to FSDN system in Slovenia (Kožar et al., 2024a and 2024b). Before the conversion to FSDN, the Slovenian FADN system faced significant challenges in various respects. One of them is the fact that the majority of the data collection burden still lies on the participating farmers. With the increased data requirements expected within the FSDN framework, this could weaken farmers' participation in the system and endanger the FADN/FSDN sample (and data quality) in the long term. One of the aims of the project, which produced an extensive range of outcomes (listed in Kožar et al., 2024a), was to test the compilation of a smaller quantity of new farm-level sustainability data on existing FADN farms in order to provide recommendations for the timely and comprehensive conversion to FSDN in Slovenia. In essence, the ambition was to test the "FSDN-like" processes on real farms (data collection, data sharing, farm feedback and advisory service, etc.) in the Slovenian context.

METHODOLOGICAL APPROACH

The sample of real (surveyed) farms participating in the project was purposive by design and not representative of the FADN population in Slovenia. The reasons for this were limited time and resources within the project, as well as typically low willingness of farmers to participate (Kožar et al., 2024a). Furthermore, the aim of the project was not to produce accurate values for the new sustainability data/indicators, but to test "FSDN-like" processes of data compilation on real farms. The criteria for selecting FADN farms in the surveyed sample included representation of the most important types of farming and economic size classes of agricultural holdings, location (inclusion of agricultural holdings in areas with natural or other specific constraints (ANC)), as well as the inclusion of organic and small farms. The initial sampling list contained 55 farms, while the final list included 22 farms that were willing to cooperate in our survey. 6 of the surveyed farms were engaged in crop production, 15 in livestock production, and

one surveyed farm had mixed production; 19 surveyed farms were located in ANC areas, and 5 farms had organic production. Selection of the participating farms was executed by the staff of one of the FADN accounting offices under the Chamber of Agriculture and Forestry of Slovenia (also part of the project team); more details are available in Kožar et al. (2024a).

The next phase was the selection and prioritization of tested farm-level sustainability indicators, for which the data compilation processes were tested on surveyed FADN farms. The selection process started with the review of the indicator list proposed in autumn 2022 within the EU-funded IPM2–FSDN pilot project (FSDN Workshop, 2022) and of the indicator list proposed by previous national research (Kožar et al., 2022; this set of indicators was based on the indicator list and outcomes of the FP7 project FLINT: Kelly et al., 2015; Vrolijk and Poppe, 2021). The project team and data collectors conducted several rounds of revisions and simplifications of the proposed indicators through workshops, working meetings and testing of the questionnaire. Attention was devoted to compiling a list of indicators that would be supported as much as possible with existing databases in order to reduce the burden on farmers. Some indicators were not tested in the project, either because they were not relevant in the Slovenian context, were too complex or not feasible within the project timeline or data were already existent in other databases, etc.

The list of the tested farm-level sustainability indicators was finalized by June 2023 as per the project timeline. It needs to be added that the first proposal of the new FSDN variables by the European Commission was circulated in Autumn 2023 and agreed with the EU Member States by the end of September 2024 (Implementing Regulation No. 2024/2746, 2024).

Data was collected for the accounting year 2022 with the help of in-person surveys (data collected directly on the surveyed farms) and pre-filled sustainability data (data from „data sharing", i.e. from existing administrative and other databases). In-person surveys on farms were conducted between June and September 2023, whereas the completion, processing and validation of data were completed by the beginning of 2024. Data compilation was performed by data collectors, who were part of the project team and employed at one of the accounting offices. They had a lot of experience in FADN and direct work with farms, which saved a lot of time. Data collectors were instructed to provide informed consent from the surveyed farms, to collect certain general data about the surveyed farms, and to collect information about data compilation process (measure duration of different phases, report key obstacles in the processes, etc.). Additionally, they were requested to pre-fill data from the existing databases for the surveyed farms and to enter data digitally by default, i.e. in an electronic file, rather than on paper.

Several other aspects of farm-level data compilation in the light of the conversion to FSDN were analysed in the project, such as accessibility/convertibility and interoperability of databases for (Slovenian) agriculture, as well as strengthening the agricultural advisory service in the field of farm sustainability performance. Lastly, a very rough estimate of additional time and costs of compiling new farm-level sustainability data compared to the costs of collecting only FADN data was made, with unchanged approach to data compilation (majority of data collection burden on farms, weak or non-existent data interoperability, etc.).

RESULTS

The final list of farm-level sustainability indicators, for which the data was compiled on the surveyed farms, included 38 indicators (Fig. 1.): 11 indicators cover economic, 15 environmental, and 12 social aspect of farm sustainability; additionally, some general (basic) data on surveyed farms were collected. All the tested indicators are listed in the Annex. Compared to the corresponding new FSDN variables (Annex VIII of Implementing Regulation No. 2024/2746, 2024), the majority of the tested indicators are highly comparable (same or similar) in terms of required data or covering similar topics.

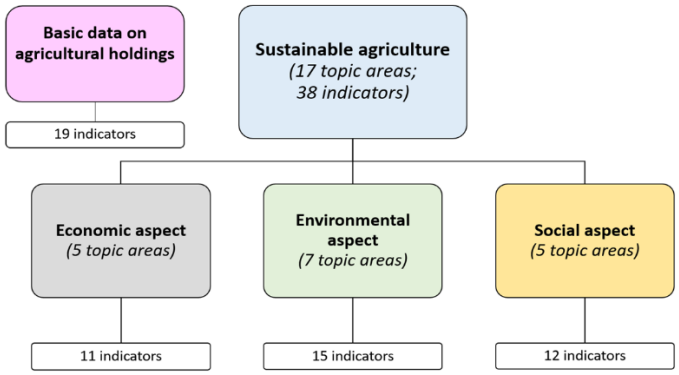

Figure 1. Number of tested indicators by farm sustainability aspect and number of basic data on agricultural holdings, final list (all indicators listed in Annex).

Source: Kožar et al. (2024a)

Since the sample of surveyed farms was not representative by design, we do not present the absolute values of the selected compiled data/indicators in this paper. These values could only be used orientationally as rough estimates and would need to be interpreted with caution. Nevertheless, based on the data compiled, the farm-level feedback (benchmarking) report was upgraded: in addition to key FADN results, the new sustainability indicators were added, and a "dashboard" style, benchmarking elements and more attractive, graphical layout were used. Furthermore,

two workshops with the surveyed farms and one workshop for agricultural advisors were conducted, where the compiled indicators, an upgraded farm feedback report, and other relevant project outcomes, such as a step-by-step proposal of advisory service based on the collected farm sustainability data, were presented (Kožar et al., 2024a).

The outcomes of data compilation on the surveyed farms confirmed that in-person data collection on farms would be very time-consuming (more than 5.5 hours per surveyed farm, of which cca. 3.5 hours for data collection, entry and basic data control). These and other relevant outcomes (e.g., Fig.2) were communicated to the European Commission during the negotiation process, with calls for a further reduction of the quantity of the required new data/variables within the FSDN (especially of the "survey" type of data), as well as for their simplification and stepwise introduction. Rough estimates showed that the costs of compiling additional (new) farm-level sustainability data could be at least two thirds higher compared to costs for the compilation of the "standard" FADN data (details in Kožar et al., 2024a).

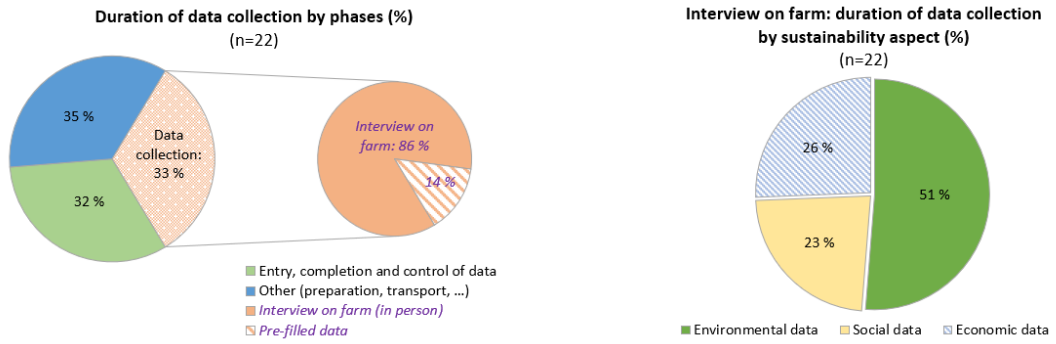

Figure 2. Estimated duration of data compilation for the preparation of test sustainability indicators on surveyed farms.
Source: Kožar et al. (2024a)

DISCUSSION

The compilation of the new sustainability data on real farms carried out in our project was an important and timely small-scale feasibility exercise of the "FSDN-like" processes for Slovenia, as it was conducted parallel to the FSDN process at the EU level, and several aspects of the conversion to FSDN in the Slovenian context were examined and tested.

Related to the presented project outcomes, some limitations need to be highlighted. The first limitation is the unrepresentative sample of surveyed farms (purposive sample), which disables generalization to the population of FADN holdings. A further limitation was the timing and short duration of the project (October 2022–September 2024): the project started well before the first proposal of the new FSDN variables (indicators) was circulated by the European Commission (finalized at the very end of the project, end of September 2024; Implementing Regulation No. 2024/2746; 2024). Thus, a complete alignment of sustainability indicators, tested in the project, with the final FSDN indicators (new FSDN variables) was not possible.

Nevertheless, the process of compiling the new sustainability data from real farms highlighted several important issues, such as the sensitivity of certain issues for farms, importance of communication with farms, staff specialization and skills – related to that, also the importance of good instructions and definitions of the requested data. Even with a small quantity of newly collected farm-level sustainability data, it was evident, that in Slovenia data sharing (interoperability) related to FADN and new sustainability data between different data-holders is weak or non-existent and that there are significant organizational and administrative challenges. Further, the challenges related to human resources (insufficient number of specialized staff, level of digital skills, etc.) were indicated.

An overall conclusion is that maintaining the *status quo* approach to data compilation in the FSDN system (weak data sharing, majority of data collection burden on participating farms; in the project this was emulated through in-person interviews on farms) would be very time consuming, expensive and likely endangering for the core FADN through lower willingness of the farmers to participate. Therefore, significant systemic and organizational changes at key stakeholders in the FADN/FSDN network were recommended. It is also crucial to significantly strengthen data sharing (interoperability), digitization and optimization of key processes, and lastly, training of data collectors, farm advisors and farmers (Kožar et al., 2024a).

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ANNEX

Table 1. Final list of tested indicators of farm-level sustainability.

Economic indicators of farm-level sustainability (Nr. of topic areas: 5; Nr. of indicators: 11)	
Topic area	**Indicator name**
Innovation	Number and type of on-farm innovations
	Investments for on-farm innovations (novelties)
Risk management	Use of risk management tools
	Futures (contracts) for selling products
	Memberships in agricultural cooperatives or in other agricultural interest groups
Market integration, quality schemes	Marketing channels
	Direct sale of agricultural products
	Participation in food quality schemes
Total income of farm household, off-farm income	Average (net) hourly wage
	Disposable total income of farm household
Access to land	Renting of agricultural land
Environmental indicators of farm-level sustainability (Nr. of topic areas: 7; Nr. of indicators: 15)	
Topic area	**Indicator name**
Animal welfare	Access to yard
	Number of grazing days
Manure use and management	Import, export and production of manure on farm
	Manure storage
	Manure nitrogen loading of UAA (utilized agricultural area)
	Manure application techniques
Renewable energy	Renewable energy production
Organic farming	Share of sales of products sold as organic
Agricultural practices	Tillage management practices
	Plant residues removal
Water management	Irrigated area and water used for irrigation
	Use of drainage systems
Landscape features	Built landscape features
	Water landscape features
	Plant landscape features
Social indicators of farm-level sustainability (Nr. of topic areas: 5; Nr. of indicators: 12)	
Topic area	**Indicator name**
Generational renewal	Farm management
	The year of manager taking over the farm
	Farm succession
Work safety	Number of occupational accidents on the farm
Working conditions	Daily working hours of farm holder/manager
	Days of leave of farm holder/manager
Quality of life	Availability and access to basic services and infrastructure in the local environment
	Access to broadband internet connection in rural areas
Knowledge and training	Level of the general education of farm holder/manager
	Participation in EIP projects
	Other forms of informal training of farm household members
	Farm advisory services

Source: Kožar et al. (2024a)