

# Farm-level indicators for the evaluation of sustainable agriculture in Slovenia

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**Abstract** – This paper presents the key outcomes of the process of compiling a set of indicators of sustainable agriculture in Slovenia at farm level. In the framework of two participatory workshops, a set of 29 topics and 90 indicators at farm level was proposed, considering all three dimensions of sustainability (economic, environmental and social). Almost one fifth of proposed indicators can be based solely on FADN data, 18% on other existing farm-level databases and 22% on combined data sources. Around 41% of proposed indicators would need to be based on data of additional on-farm questions/measurements. Further prioritization of proposed set of topics and indicators is recommended. Synchronisation with the process of conversion of FADN to FSDN would enable abundant synergies, content- and cost-wise.

## INTRODUCTION

Nowadays, it is not possible to create a quality agricultural policy decision without a reliable system for capturing real environmental, economic, social and other data. In the field of agri-food sector, Slovenia still does not have a unified, integrated database at various levels, which would enable systematic, effective monitoring and evaluation of sustainable orientation of farms and formulation of evidence-based sectoral development policies. Especially, there is a lack of data and indicators at farm level, despite the growing data needs.

Following the example of good practice from FLINT project (Vrolijk and Poppe, 2021) and plans of the European Commission to convert and expand FADN microeconomic database with the environmental and social indicators into FSDN (Farm Sustainability Data Network), we propose the FADN as a starting point for the compilation of sustainability topics and farm-level indicators also for Slovenia. The aim of the paper is to present the key outcomes of this process.

## METHODOLOGICAL APPROACH

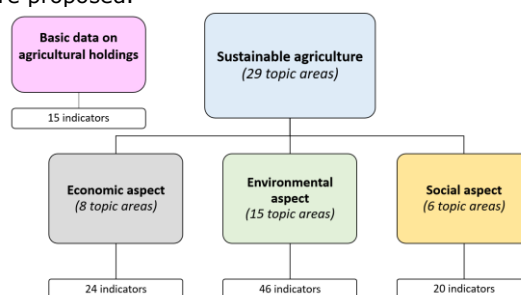
Two participatory workshops (Bertoncelj et al., 2021) were held to define the key topics of sustainable agriculture that could contribute to specific objectives of Slovenian agricultural policy (Resolution MAFF, 2020) and a set of indicators at the level of agricultural holdings. At the first workshop, based on the review of the FLINT outcomes (Kelly et al., 2015; Final publishable summary report, 2016; Vrolijk and Poppe, 2021), relevant literature, as well as based on the review of the available farm-level databases for Slovenian agriculture, key topics and an initial (broader) set of indicators, considering all three dimensions of sustainability (economic, environmental and social) were proposed.

At the second workshop, the initially proposed set of topics and indicators was thoroughly reviewed in terms of their relevance for Slovenian agricultural policy and feasibility of collecting data (Bertoncelj et al., 2021). Some topics were merged, some were added or excluded, and the initial (broader) set of indicators was refined. After some additional refinements, a final (shorter) set of indicators was proposed to monitor the sustainable orientation of agriculture at the level of agricultural holdings. For

each farm sustainability topic and indicator, detailed descriptive sheets were prepared. Inter alia, the topic descriptions include the reference and expected contribution of the topic to specific objectives of the Slovenian agricultural policy, whereas the indicator description sheets detail the methodology for their calculation and monitoring, as well as the required datasets at farm level.

## RESULTS AND DISCUSSION

Altogether, 29 topics are proposed (Figure 1.), which cover all three dimensions of sustainability (economic, environmental, and social). The proposed set of topics and indicators is not comprehensive or definitive and can be adapted according to the policy needs and feasibility of the data collection at farm level. Within the economic dimension of sustainable agriculture, 8 topics and 24 indicators are proposed. Within the environmental dimension, 15 topics and 46 indicators are defined, while for the social dimension of sustainable agriculture, 6 topics and 20 indicators are proposed.



In addition to the proposed set of topics and associated indicators of sustainable agriculture, it is also proposed to collect a descriptive set of data on agricultural holdings, which is important for understanding and interpreting the assessment of sustainable agriculture. Such a basic dataset includes data about farm's production resources, production type, production intensity, farm owner/manager and agricultural household.

A descriptive sheet was prepared for each proposed topic of sustainable agriculture, and an indicator sheet was prepared for each proposed indicator within an individual topic. The descriptive sheet describes the relevance of individual topics for Slovenian agricultural policy and their contribution to the objectives of this policy. Further, individual indicators of sustainable agriculture at farm level are proposed for each sustainability topic and additional information is defined (e.g. required and already available data for preparation of these indicators, methodology for their preparation, etc.). As mentioned, the indicator sheets present in more detail the individually proposed indicators and the methodology for their preparation and monitoring.

**Table 1.** Number of indicators according to the dimensions of sustainable agriculture and the availability of data sources required for their preparation.

Availability of data	Economic dimension	Environmental dimension	Social dimension	Total
FADN database	10	3	4	17
Other (existing) databases	2	13	1	16
Questionnaire at agric. holding	7	17	13	37
Combined data sources	5	13	2	20
Combined with FADN	4	11	1	16
Other combined data sources	1	2	1	4
<b>Total</b>	<b>24</b>	<b>46</b>	<b>20</b>	<b>90</b>

It is estimated that almost a fifth of the proposed indicators can be prepared exclusively on the basis of FADN data, a further 18% exclusively on the basis of other existing databases (e.g., administrative databases) and 22% of proposed indicators on the basis of combined data sources (Table 1.). Around 41% of all proposed indicators should be prepared solely based on data collected with additional questions/measurements on farms. Almost 18% of proposed indicators could be prepared based on a combination of FADN data with other databases or with additional questions/measurements on agricultural holdings. FADN data, exclusively or in combination with other data sources, can thus be used to prepare just around 37% of all proposed indicators for monitoring sustainable agriculture.

The highest share of the proposed indicators of sustainable agriculture, for which additional data would need to be collected anew on farms, are within the social dimension of sustainable agriculture (65%), and the lowest within the economic dimension (29%). In the context of the environment, additional data collection on agricultural holdings would be needed to prepare 37% of the proposed indicators. As expected, the largest share of indicators, for the preparation of which only FADN data can be used (without combination with other data sources), is proposed within the economic dimension of sustainable agriculture (42%) and the lowest within the environmental dimension (7%). Within the social dimension of sustainable agriculture, FADN data alone can be used for one fifth of proposed social indicators.

As mentioned, the proposed list of sustainability topics and indicators for Slovenia is not comprehensive or definitive. Therefore, it is highly recommended to further prioritize it according to the strategic policy needs, feasibility of data collection at farm level and refine it with the participation of key stakeholders in the country. This process is recommended to be synchronised with the process of conversion of FADN to FSDN (2022), which would enable abundant synergies, content- and cost-wise.

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