# Estimating Organic Farms' Marketability from Limited Data – Evidence from Poland

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***Abstract:***

***Purpose:*** *In 2019, the European Commission made organic farming one of its Green Deal's key elements. However, in order to develop, this sector requires a support system based on reliable data. This is difficult in countries where agricultural record-keeping is not obligatory - especially for small and medium-sized farms, the main organic producers. To meet this challenge, it seems necessary to develop a method of estimating organic farms' marketability potential.*

***Design/Methodology/Approach:*** *In its first part, the article describes the adaptation of the method commonly used (under Farm Accountancy Data Network) in farms that keep agricultural accounting records to the specific conditions of farms that do not. In the second part, the proposed proprietary method was verified by a sample of 2,576 organic farms from the Podlasie region in Poland.*

***Findings:*** *The rules and practices traditionally used for EU agricultural accountancy may constitute a significant contribution to developing a universal method of estimating the marketability potential of organic farms, which is especially important for countries where agricultural accounting record-keeping is not obligatory.*

***Practical Implications:*** *The proposed approach may contribute to better planning of support for organic farms under the CAP, and, consequently, to complete implementation of the objectives set out by the European Commission in the Agricultural Green Deal.*

***Originality/Value:*** *The article presents an innovative and practical way of determining the specialization and marketability level of organic farms that do not keep agricultural accounting records.*

***JEL classification:*** *A12, Q11, Q12, R10.*

***Keywords:*** *Organic farming, green deal, CAP, estimating output potential, marketability levels of agricultural farms.*

***Paper Type:*** *Research Paper and Case Study.*

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## 1. Introduction

The development of the organic food market requires a rational support system (EC-Europa, 2016), which should be based on its needs and reliable data. The European Union does not impose record-keeping on member states (OECD, 2005), which results in a shortage of data on which rational economic decisions can be made for the organic farming sector. In Poland, for instance, as in Romania (Stancie, 2018), farmers are not subject to personal income tax regulations, and farming does not require accounting records. This approach applies to many countries (Andersen *et al.,* 2002; Hinn and Blandford, 2007).

On the one hand, the accountancy and fiscal simplifications facilitate the functioning of small family farms. On the other hand, they make it difficult to create tools to support the sector and plan its development. This is particularly important in organic farming (Regulation 834/2007), which by its nature is most often carried out on small and medium-sized family farms (EC-Europa, 2022) with diverse accounting and fiscal preferences. The article presents an innovative and practical way of determining the specialization and marketability level of organic farms that do not keep agricultural accounting records.

## 2. Material, Methods and Evaluation

As a starting point, organic farms' database with information on the crop area and livestock numbers on a given farm was researched (IJHARS, 2018). This data is insufficient to conclude marketability potential that could be compared at the interregional or international level. Using a tool analogous to that employed in the European Farm Accountancy Data Network (FADN) made it possible to create a method of estimating the marketability potential of farm output without accounting records and comparing the results between regions and countries. The authors linked the table of regional standard output indicators used in FADN to calculate the specialization of farms and the marketability of their produce.

***Step 1.*** *Determining the Standard Output for Organic Farms*

The standard output (SO) is a universal parameter used in all EU countries to assess farmers' economic situation and shape support instruments for the Common Agricultural Policy. The SO value is determined based on statistical data about the value of output per hectare of crop or head of livestock (EUROSTAT, Regulation 715/2014). The method does not provide information about actual sales from farms but only indicates farms that have the sufficient potential (an area or herd size) to achieve an output considered to be potentially marketable in a given country/region (Regulation 1166/2008).

SO indicators algorithm:

$$\text{Standard Output} = (S + R + D + \Delta Z)/5 \qquad (1)$$

where:
S - sale
R – agricultural consumption (e.g., for sowing, for fodder)
D - household consumption
$\Delta Z$ - changes in stock supplies
5 - five-year period

The authors decided to use the following formula to estimate the standard output (SO) in the farms examined:

$$SO = (\sum (\text{area} * \text{SO indicator}) + \sum (\text{livestock} * \text{SO indicator})) \qquad (2)$$

The FADN databases contain around a hundred indicators for crops and around thirty for livestock (Regulation 1217/2009). Due to the variety of crops on organic farms, there may be situations where the primary crop on a farm is not included in the FADN's list of SO indicators. This happens with crops considered 'non-significant' from the whole country's economy. However, to distort the image of organic production, it is recommended to verify 'non-significant' crops and determine the approximate SO indicator based on the similarity of cultivation technology and expected revenues from 'non-significant' and significant crops.

**Step 2.** *Determining the Marketability Threshold*

The FADN receives reports exclusively from farms meeting the marketability criterion. To compare the results, the authors adopted a value considered to be the minimum economic size for a farm's produce to qualify as marketable under the FADN (Regulation 800/2008), i.e., €4,000 for Poland. It should be stressed that the algorithm described in "step 1" calculates the potential marketability of a farm's produce. A possible objection to this method might be that average regional SO indicators treat organic and conventional farms equally, even though the organic farming output may be lower. However, one of the main goals of the existing support systems dedicated to organic production is to eliminate the effects of these differences (Action Plan, Regulation 1305/2013), making it possible to consider this line of reasoning accurate.

**Step 3.** *Designating the Main Production Direction*

According to one of the current classification systems, a farm is considered specialized if the selected activity exceeds 40% of its total output value (Wojtaszek, 1965). Following this premise, calculations of the percentage of individual activities in the total SO were made, determining the main production (both crops and livestock) of potentially marketable organic farm produce in a given area.

$$SO = SO_1 + SO_2 + SO_3 + SO_4 + SO_5 + SO_6 + SO_7 + SO_8 + SO_9 + SO_{10} + SO_{11} + SO_{12}$$

$$_{\%} SO_1 = SO_1 / SO * 100\% \tag{3}$$

Information on the size of a livestock herd (1) and the individual crop area was aggregated into larger blocks as follows: (2) orchards and other fruit plantations; (3) permanent grassland; open field crops: (4) cereals, (5) legumes, (6) root crops; (7) industrial and fibrous, (8) vegetables, (9) strawberries and wild strawberries,[3] (10) seed crops, (11) fodder, (12) other.

***Step 4.** Secondary Elimination of Non-marketable Production*

The sample includes farms exceeding the defined marketability threshold, including those focused on production usually considered unmarketable in a given country. In Poland, this applies to roughage cultivation on arable land. Farms specializing in fodder crops were removed from the database. Finally, farms with no livestock whose share of fodder grown on arable land exceeded 40% of the total SO were excluded. In this way, the sample was verified by selecting only farms whose orientation indicated simultaneous organic products on the market.

## 3. Practical Application – Evidence from the Podlasie Region
**Determining the Standard Output Total for each Organic Farm (Step 1)**

In 2017, 2,576 farms in the Podlasie region had an organic certificate. The SO total for each of these farms was calculated based on the recorded cultivation area and herd size and based on the SO indicator sets for the FADN regions of Mazowsze and Podlasie (Bocian *et al.,* 2017).

### 3.1 Determining the Marketability Threshold and Establishing the Main Production Direction (Steps 2-3)

In the next step, the total SO calculated for a given farm was compared with the marketability threshold adopted for the given country, and the farm's main production direction was determined. Farms, where a given group of crops or livestock exceeded 40% of the total SO, were considered specialized. With these assumptions, of a total of 2,576 organic farms in the region studied, only 1,068 achieved an SO of over €4,000.

Table 1 shows examples of calculations for nine anonymized organic farms from Podlasie. Only y, r, w farms exceeded the marketability threshold. SO items that make it possible to define the main production are marked in bold.

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[3] *The separation of strawberries due to the specificity of agri-production in Podlasie.*

**Table 1.** *The Total and Structure of Standard Output in Sample Farms*

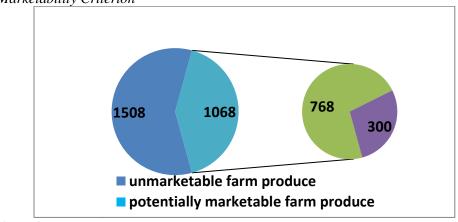| ID | SO | of which | | | | | | | | |
| | | orchards | Live-stock | fields | of which | | | | | |
| | | | | | cereals | industrial crops | vegetables | legumes | Strawberries, wild strawberries | fodder |
| x | 11,635 | 0.00% | 0.00% | 100.00% | 27.72% | 14.01% | 0.00% | 0.00% | 0.00% | **58.27%** |
| y | 34,508 | 20.55% | 0.00% | **79.45%** | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | **79.45%** |
| z | 8,700 | 7.63% | 0.00% | 92.37% | **90.00%** | 0.00% | 2.36% | 0.00% | 0.00% | 0.00% |
| q | 14,019 | 0.00% | 0.00% | 100.00% | 21.09% | 17.83% | 0.00% | 0.00% | 30.54% | 30.54% |
| r | 147,864 | 19.46% | 1.08% | **79.46%** | 0.00% | 3.01% | 0.00% | 0.00% | 38.22% | 38.22% |
| s | 12,242 | 1.21% | 0.00% | 98.79% | **91.26%** | 0.00% | 0.00% | 7.53% | 0.00% | 0.00% |
| t | 13,675 | 1.08% | **64.79%** | 34.13% | 0.00% | 1.59% | 0.00% | 0.00% | 0.00% | 32.54% |
| u | 12,359 | 25.92% | 0.00% | 74.08% | 15.82% | 32.53% | 0.00% | 0.00% | 12.87% | 12.87% |
| w | 57,875 | 10.38% | 0.00% | 89.62% | **52.31%** | 4.05% | 22.48% | 3.60% | 3.59% | 3.59% |

**Source:** *Own Study.*

## 3.2 Secondary Elimination of Unmarketable Production Lines (Step 4)

While fodder crops made up 47% of the area of all (2576) organic farms, at approximately 38%, this was in the sample (1068) of farms considered marketable. This prompted the authors to "cleanse" the research base again and eliminate farms that focused on unmarketable fodder crops. As a result, 768 organic farms in the Podlasie region were recognized as potentially marketable.

**Figure 1.** *Organic Farms' Structure in the Podlasie Region According to the Marketability Criterion*



**Source:** *Own study.*

In the samples in Table 1, the main production on farms x and y is fodder, since they do not keep livestock simultaneously; then farm y – despite having exceeded the marketability threshold – was not included in the pool of marketable farms. As a result, farms' marketability in the Podlasie region appears in Figure 1. There are 1,068 farms (i.e., 41%) with an SO exceeding the marketability threshold; however, only 768 (29.8%) exceed this threshold and have a production structure indicating a marketable output.

## 4. Conclusions

The application of SO indicators presented, traditionally used for EU agricultural accountancy, may constitute a significant contribution to the development of a universal method of estimating organic farms' marketability potential, which is especially important for countries where agricultural accounting record-keeping is not obligatory.

Basing the calculations on SO indicators uniform in all EU countries guarantees the observance of information reliability standards and determines the comparability of data and the calculations based on them. Determining the main production while limiting the sample only to farms exceeding the marketability threshold makes it possible to recognize whether a farm specializes in marketable products and, thus, estimate the organic farming sector's output potential.

**Resources:**

Action Plan for the Future of Organic Production in the EU. Retrieved from: https://ec.europa.eu/transparency/regdoc/rep/1/2014/EN/1-2014-179-EN-F1-1.Pdf.

Andersen, F.G., Asheim, L.J., Mittenzwei, K., Veggeland, F. 2002. Taxation of Agriculture in Selected Countries. NILF-report, 8.

Bocian, M., Cholewa, I., Tarasiuk, R. 2017. Standard Output Coefficients "2013" for the Purposes of the Community Typology for Agricultural Holdings. IERGZ

EC.Europa. Facts and Figures on Organic Agriculture. Retrieved from: https://ec.europa.eu/agriculture/rica/pdf/Organic_2016_web_new.pdf.

EUROSTAT. Retrieved from: https://ec.europa.eu/eurostat/cache/metadata/en/ef_esms.htm#meta_update1595940715401.

FADN Committee. 2016. Typology Handbook, RI/CC 1500 Rev. 4.

Hill, B., Blandford, D. 2007. Taxation Concessions as Instrument of Agricultural Policy. In: 81st Annual Conference, April 2-4. Reading University.

IJHARS. 2018. Agricultural and Food Quality Inspection. Polish Organic Farms Data Base. Retrieved from: https://www.gov.pl/web/ijhars/dane-o-rolnictwie-ekologicznym.

OECD. 2005. Taxation and Social Security in Agriculture. OECD Publishing, Paris.

EC. Europa. 2020. Organic farming after 2022. Retrieved from: https://ec.europa.eu/info/food-farming-fisheries/farming/organic-farming/organics-glance#organicfarmingafter2022.

Regulation 1166/2008 OJ of the EU L, 321, 1.12.2008.

Regulation 1217/2009 (Annex I). OJ of the EU L, 328, 15.12.2009.

Regulation 1305/2013 OJ of the EU L, 347, 20.12.2013.

Regulation 715/2014 (Annex). OJ of the EU L, 190, 28.6.2014.

Regulation 800/2008. OJ of the EU L, 214, 9.8.2008

Regulation 834/2007 OJ of the EU L, 189, 20.7.2007.

Stanciu, N. 2018. Study on Taxes and Charges Applied in the European Union and in Romania in the Field of Agriculture. Agricultural Rural Devision, 18(2).

Wojtaszek, Z. 1965. Effectiveness of Production Directions of Individual Farms. Zagadnienia Ekonomiki Rolnej, 68(2).