

STUDY ON THE IMPACT OF AGRICULTURAL POLICIES ON THE ECONOMIC EFFICIENCY OF FARMS IN ROMANIA

Geta-Mirela ISPAS, Claudiu - Ovidiu AILIOAEI, Oana COCA, Ștefan GAVRIL

Iasi University of Life Sciences, Faculty of Agriculture, 3, Mihail Sadoveanu, Iasi, Romania,
E-mails: mirela.ispas@iuls.ro, claudiu.ailioaei@iuls.ro, oana.coca@iuls.ro, gavril.stefan@iuls.ro.

Corresponding author: oana.coca@iuls.ro

Abstract

The Common Agricultural Policy (CAP) constitutes a key element of the European Union's agricultural framework, providing financial support and regulatory measures aimed at improving the economic efficiency and sustainability of farms, including those in Romania. This research investigates the implications of the CAP on the profitability and economic performance of farms in Romania, considering their diversity. It examines the distribution of CAP subsidies and how farmers can influence their value by meeting certain regulations and criteria. The methodology combines quantitative and qualitative methods, such as: analysis of official farm financial data and information on subsidies received, complemented by interviews and questionnaires with farmers to assess the impact of CAP regulations on farmers. The results show to what extent CAP regulations contribute to increasing subsidies and improving farm profitability, depending on how they are implemented. The conclusions highlight the significance of the Common Agricultural Policy (CAP) for Romanian farms and propose strategies to improve its implementation, contributing to the long-term sustainability of the agricultural sector.

Key words: CAP, subsidy, economic efficiency, farm

INTRODUCTION

The Common Agricultural Policy (CAP) is fundamental to the European Union's agricultural framework, principally aimed at assisting farmers and guaranteeing food security throughout the region. From 2023 to 2027, a total budget of EUR 387 billion has been designated for the CAP, with over EUR 21 billion explicitly allocated for Romania's agricultural and rural development requirements (European Commission, 2023) [10]. These funds are essential for supporting farmers and developing the rural environment. The implementation of the CAP in Romania has had a significant impact on the agricultural sector. The subsidies granted have helped to increase farmers' incomes and modernize farming practices. However, the distribution of these funds has, in some cases, favored large farms to the detriment of small and medium-sized farms (Alexandri & Luca, 2019) [5]. According to Brînaru and Dona (2016), subsidies in the South-Muntenia region have contributed directly to farm modernization and profitability, particularly for larger agricultural enterprises [6].

The CAP 2023-2027 focuses on ten key objectives, including ensuring a decent income for farmers, developing competitiveness, combating climate change and protecting the environment (European Commission, 2023) [9]. These objectives reflect a cohesive strategy to address the challenges currently facing the agricultural sector. As highlighted by Chitea (2024), the National Rural Development Program has played an essential role in supporting small farms by providing the financial assistance needed to improve productivity and better integrate them into the European market [7].

Subsidies provided through the CAP have also significantly influenced crop specialization in Romanian farms. According to FADN data, Galluzzo (2016) emphasizes that subsidy allocation has driven a more specialized approach to agricultural production, leading to greater efficiency and profitability [11]. Similarly, Lascăr (2014) highlights the crucial role of subsidies in supporting rural development, particularly in less developed regions such as South-Muntenia, where these funds have contributed to farm modernization

and improved infrastructure [12]. Submeasure 6.1. is destined to help young farmers [8].

These objectives embody a cohesive strategy to tackle the prevailing issues in the field of agriculture.

In this regard, it is essential to evaluate the influence of the CAP on the profitability of farms in Romania. Consequently, indicators pertaining to income generated, subsidy amounts, and operational expenses have been examined. This research will enhance the comprehension of the economic sustainability of Romanian farms and offer recommendations for optimizing subsidy utilization.

Furthermore, as Galluzzo (2016) and Brînaru & Dona (2016) point out, the efficient management of European funds is an essential element in maximizing the benefits of CAP subsidies [11, 6]. These funds must be allocated in an efficient manner, so as to support the development of farms, increase their competitiveness and promote environmentally sustainable agriculture. The implementation of CAP strategies must take into account their impact on the environment, while promoting agricultural practices that are both economically viable and environmentally friendly.

MATERIALS AND METHODS

This study aims to assess the impact of the Common Agricultural Policy (CAP) on the economic efficiency of farms in Romania, through the correlated analysis of data on agricultural production, subsidies received and operating expenses.

The main objective is to determine the degree of influence of subsidies on the profitability of farms, thus contributing to a better understanding of their economic sustainability. In order to achieve this objective, the study pursues specific objectives, as follows:

- To determine farm incomes by analyzing agricultural production and market prices for the main crops.
- Calculation of gross margin and profit without subsidies, followed by assessment of

the impact of CAP financial support on the economic performance of farms.

-Recommendations for optimizing the use of subsidies to increase the economic efficiency and sustainability of Romanian farms.

The study uses a complex methodological approach, combining quantitative and qualitative methods, structured as follows:

-*Data collection*: in addition to data from official sources, questionnaire interviews were conducted with farmers to obtain information on production expenditure and their perception of the efficiency of CAP subsidies.

This qualitative data provided a direct insight into the challenges faced and possible solutions for optimizing financial support. The data used came from official sources, such as the National Institute of Statistics (NSI) and the database on subsidies granted to farmers (Agency for Payments and Intervention for Agriculture, APIA) [1].

-*Statistical analysis*: Relevant economic indicators such as income per hectare, average production expenditure and gross profit were calculated using descriptive and comparative methods.

RESULTS AND DISCUSSIONS

This research investigated the impact of changes in agricultural production and financial support under the Common Agricultural Policy (CAP) on Romanian farms from 2020 to 2023 [10].

The analysis utilized official data from the National Statistical Institute (NSI) - Tempo Online [15]. and the Ministry of Agriculture and Rural Development (MADR) [13, 14].

These data were used to assess the dynamics of cultivated areas, agricultural production and prices of the main agricultural crops.

For each crop analyzed, the following information was collected: total cultivated area (S), average production (qm), total output (Qt) and average price (Pr_{med}).

The calculated indicators answer the question "What is the impact of CAP subsidies on farmers' incomes and profitability of agricultural production?"

The analysis of cultivated areas and agricultural production provides a clear picture of trends in the Romanian agricultural sector. The data in Table 1 show the evolution of wheat and maize production. Thus, the area cultivated with wheat has shown an increasing trend, while the area cultivated with maize has shown a significant decreasing trend.

Table 1. Evolution of cultivated area, production and average price for wheat and maize, (2020-2023).

Year	S [ha]	q _m [kg/ha]	Q _t [to]	P _{r med} [lei/kg]
WHEAT				
2020	2,155,254	2,966	6,392,369	0.79
2021	2,175,077	4,797	10,433,751	0.96
2022	2,168,662	4,004	8,684,237	1.49
2023	2,317,692	4,364	9624074	1.1
MAIZE				
2020	2,537,104	3,977	10,096,689	0.7
2021	2,549,281	5,802	14,820,693	0.9
2022	2,431,106	3,298	8,037,134	1.31
2023	2195344	3982	8743995	1.08

Source: Own calculations.

This dynamic is explained by the impact of climate change on the structure of agricultural production (the share of fall crops is increasing at the expense of spring crops) and the different pace of price increases between wheat and maize.

For sunflower and rapeseed, the data suggest a reversal of farmers' interest in their importance in the crop rotation and income structure.

Table 2 presents the details for these crops.

In this regard, the area under sunflower has decreased by about 65,000 hectares in favor of rapeseed.

The area under rapeseed increased by more than 270,000 hectares during the period under review.

Average yields have also decreased for sunflower and increased for rapeseed, and prices are clearly in favor of rapeseed production.

Assessing the economic performance of the main agricultural crops in Romania requires a detailed analysis of the expenditure and

income structure before considering the impact of subsidies.

Table 2. Evolution of cultivated area, production and average price for sunflower and rapeseed (2020-2023).

Year	S [ha]	q _m [kg/ha]	Q _t [to]	P _{r med} [lei/kg]
SUNFLOWER				
2020	1,142,841	1,858	2,122,865	1.5
2021	1,123,960	2,530	2,843,531	1.99
2022	1,093,265	1,927	2,106,573	2.88
2023	1,077,867	1,870	2,015,621	1.98
RAPESEED				
2020	362,865	2,150	780,155	1.61
2021	445,918	3,084	1,375,067	1.96
2022	468,870	2,622	1,229,532	2.76
2023	641,425	2,790	1,789,667	2.12

Source: Own calculations.

Table 3 presents the evolution of production expenses (C_p), operating expenses (C_o), average revenue (V_m), gross margin (M_B) and profit (P_R).

This approach allows an objective assessment of the economic performance of each crop and provides a comparative basis for analyzing the impact of subsidies on agricultural profitability.

Figure 1 illustrates the variation in profit per hectare for the main agricultural crops in the period 2020-2023, before CAP support.

It can be seen that 2020 and 2023 were the most difficult years, with significant losses in wheat (-1,891.8 lei/ha in 2020) and sunflower (-1,533 lei/ha in 2020 and -970.4 lei/ha in 2023).

In contrast, in 2021 and 2022, crops were more profitable, with the highest gains recorded for rapeseed (2,794.72 lei/ha in 2022) and maize (2,559.74 lei/ha in 2021).

These fluctuations emphasize the importance of agricultural yields and market prices in determining farm profitability.

These trends also underline the importance of financial support in maintaining farmers profitability, analyzed in detail in the following scenarios.

Table 3. Economic performance before application of CAP financial support, (2020-2023)

Year	C _p [lei/ha]	C _o [lei/ha]	V _m [lei/ha]	M _B [lei/ha]	P _R [lei/ha]
WHEAT					
2020	1,700	2,535	2,343.1	643.1	-1,891.8
2021	1,750	2,640	4,605.1	2,855.1	215.1
2022	1,775	2,710	5,965.9	4,190.9	1,480.9
2023	1,845	2,780	4,800.4	2955.	175.4
MAIZE					
2020	1,810	2,535	2,783.9	973.9	302.7
2021	1,870	2,640	5,221.8	3,351.8	2,559.7
2022	1,910	2,710	4,320.3	2,410.3	1,555.4
2023	2,030	2,780	4,300.5	2,270.5	1,335.4
SUNFLOWER					
2020	1,785	2,535	2,787.0	1,002.0	-1533
2021	1,798	2,640	5,034.7	3,236.7	596.7
2022	1,851	2,710	5,549.7	3,698.7	988.7
2023	1,893	2,780	3,702.6	1,809.6	-970.4
RAPESEED					
2020	1,670	2,535	3,461.5	1,791.5	-743.5
2021	1,695	2,640	6,044.6	4,349.6	1,709.6
2022	1,732	2,710	7,236.7	5,504.7	2,794.7
2023	1,778	2,780	5,914.8	4,136.8	1,356.8

Source: Own calculations.

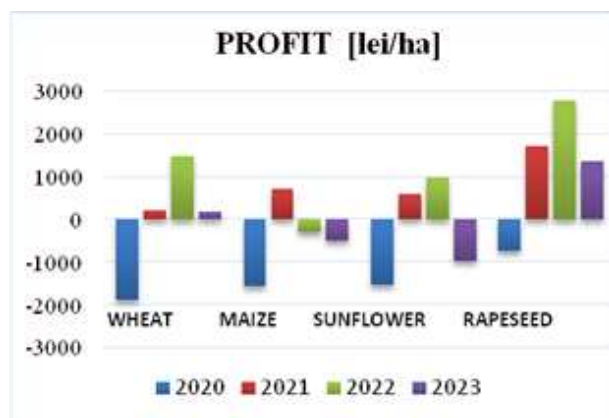


Fig. 1. Changes in profit without subsidies for the main agricultural crops

Source: Own calculations.

In order to measure the influence of subsidies on farmers incomes, three possible scenarios were designed to be followed by farmers, namely:

Scenario 1 - farmers opt for basic income support for sustainability (BISS),

Scenario 2 - Farmers opt for Basic Income Support for Sustainability (BISS) together with Eco-schemes (PD-04 - Beneficial Environmental Practices on Arable Land),

Scenario 3 - farmers opt for the combination of the 2 scenarios presented above plus the measure to maintain organic farming (DR-05 - Maintaining organic certification).

Table 4. Typology and amount of direct payments under the CAP (2020-2023)

Year	SAPS [lei/ha]	Greening payment [lei/ha]	Measure 11 [lei/ha]
2020	491.33	287.71	1,084.77
2021	475.11	288.06	1,084.77
2022	479.09	291.25	1,084.77
Year	BISS [lei/ha]	PD -04 [lei/ha]	DR - 05 [lei/ha]
2023	480.03	280.05	1,084.77

Source: Agricultural Payments and Intervention Agency (APIA), Annual Reports (2020-2023)

During the period under review, the system of direct payments granted to farmers under the Common Agricultural Policy (CAP) underwent significant changes with the transition to the CAP Strategic Plan 2023-2027. Thus, the name and structure of the main types of payments have changed, while maintaining similarities between the old and new schemes [1, 2, 3, 4].

Until 2022, direct support to farmers included: -SAPS (Single Area Payment Scheme) - equivalent to BISS (Basic Income Support for Sustainability) from 2023.

-Greening payment - replaced by the CAP Ecoschemes, of which PD-04 - Environmentally beneficial practices applicable on arable land, is to some extent equivalent to the former greening requirements.

-Measure 11 - Maintenance of organic farming - transformed into DR-05 - Maintenance of certification in organic farming.

The new payment system maintains similar objectives in terms of farmers support for sustainability and organic farming. These similarities were taken into account in this analysis, where the three different subsidy scenarios were compared to assess the impact

of financial support on farm income and profitability of agricultural production.

The projected scenarios including economic indicators are presented in Table 5, Table 6 and Table 7.

Analyzing the data in Table 5, it can be seen that the inclusion of basic income support (BISS) contributes to reducing losses, but does not consistently provide a significant increase in farm profitability.

Compared to the situation without subsidies, farmers accessing only BISS manage to slightly improve their average income, but in the difficult agricultural years (2020 and 2023), this support is not sufficient to cover losses.

Therefore, for sunflowers, the return remains negative in 2020 and 2023, and for maize and wheat, the increase is modest. This underlines that basic support provides a minimum of financial stability but is not sufficient to ensure sustainable profitability.

Table 6 highlights that the inclusion of eco-scheme PD-04 (environmentally beneficial practices applicable on arable land) leads to an improvement in profitability compared to Scenario 1.

In this case, farmers benefit from a more visible increase in average income, which is reflected in higher values of profit per hectare.

Table 5. Assessing the impact of subsidies on the economic performance of farms - Scenario 1

WHEAT					MAIZE			
	2020	2021	2022	2023	2020	2021	2022	2023
S_{BV}^1 [lei/ha]	491.33	475.11	479.09	480.03	491.33	475.11	479.09	480.03
$P_{R\ Final}^2$ [lei/ha]	-1,400.53	690.23	1,960.05	655.43	-1,069.77	1,186.91	179.47	-29.41
$V_m\ SBV^3$ [lei/ha]	2,834.47	5,080.23	6,445.05	5,280.43	3,275.23	5,696.91	4,799.47	4,780.59
SUNFLOWER					RAPESEED			
S_{BV} [lei/ha]	491.33	475.11	479.09	480.03	491.33	475.11	479.09	480.03
$P_{R\ Final}$ [lei/ha]	-1,041.67	1,071.81	1,467.85	-490.37	-252.17	2,184.75	3,273.81	1,836.83
$V_m\ SBV$ [lei/ha]	3,278.33	5,509.81	6,028.85	4,182.63	3,952.83	6,519.75	7,715.81	6,394.83

1 S_{BV} = total subsidies for each scenario. 2 $P_{R\ Final}$ = final profit after including subsidies.

3 $V_m\ SBV$ = average income with subsidies.

Source: Own calculations.

Table 6. Assessing the impact of subsidies on the economic performance of farms - Scenario 2

WHEAT					MAIZE			
	2020	2021	2022	2023	2020	2021	2022	2023
S_{BV} [lei/ha]	779.04	763.17	770.33	760.08	779.04	763.17	770.33	760.08
$P_{R\ Final}$ [lei/ha]	-1,112.82	978.29	2,251.29	935.48	-782.06	1,474.97	470.71	250.64
$V_m\ SBV$ [lei/ha]	3,122.18	5,368.29	6,736.29	5,560.48	3,562.94	5,984.97	5,090.71	5,060.64
SUNFLOWER					RAPESEED			
S_{BV} [lei/ha]	779.04	763.17	770.33	760.08	779.04	763.17	770.33	760.08
$P_{R\ Final}$ [lei/ha]	-753.96	1,359.87	1,759.09	-210.32	35.54	2,472.81	3,565.05	2,116.88
$V_m\ SBV$ [lei/ha]	3,566.04	5,797.87	6,320.09	4,462.68	4,240.54	6,807.81	8,007.05	6,674.88

Source: Own calculations.

Table 7. Assessing the impact of subsidies on the economic performance of farms - Scenario 3

WHEAT					MAIZE			
	2020	2021	2022	2023	2020	2021	2022	2023
S_{BV} [lei/ha]	1,863.81	1,847.94	1,855.10	1,844.85	1,863.81	1,847.94	1,855.10	1,844.85
$P_{R\ Final}$ [lei/ha]	-28.05	2,063.06	3,336.06	2,020.25	302.71	2,559.74	1,555.48	1,335.41
$V_m\ SBV$ [lei/ha]	4,206.95	6,453.06	7,821.06	6,645.25	4,647.71	7,069.74	6,175.48	6,145.41
SUNFLOWER					RAPESEED			
S_{BV} [lei/ha]	1,863.81	1,847.94	1,855.10	1,844.85	1,863.81	1,847.94	1,855.10	1,844.85
$P_{R\ Final}$ [lei/ha]	330.81	2,444.64	2,843.86	874.45	1,120.31	3,557.58	4,649.82	3,201.65
$V_m\ SBV$ [lei/ha]	4,650.81	6,882.64	7,404.86	5,547.45	5,325.31	7,892.58	9,091.82	7,759.65

Source: Own calculations.

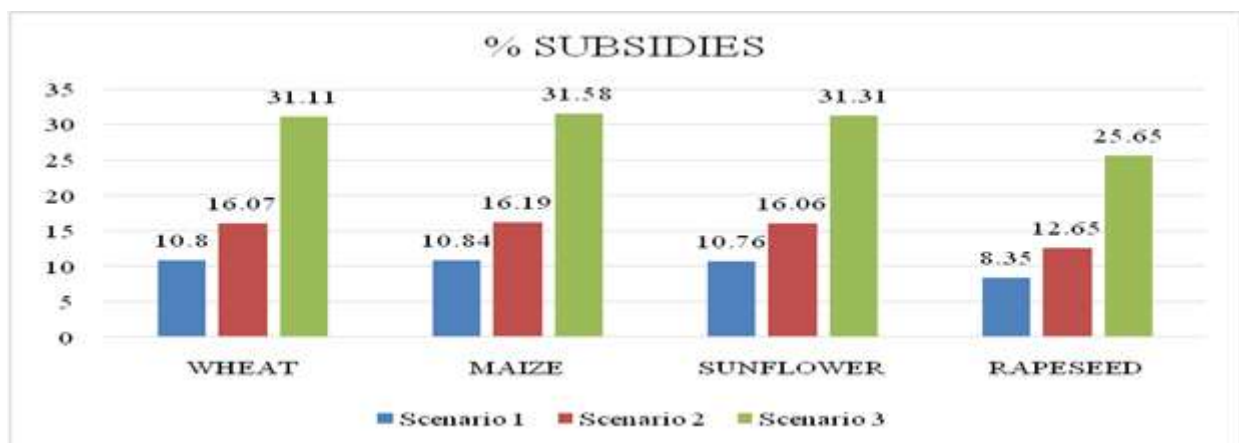


Fig. 2. Share of subsidies in income for main agricultural crops, by CAP support scenarios

Source: Own calculations.

The analysis of the data in Table 7 shows that Scenario 3 leads to the highest increase in farm profitability compared to the other scenarios analyzed. In this context, the profit per hectare is significantly higher, reflecting higher economic stability for farms benefiting from this support.

In the year 2023, characterized by low profitability under the other scenarios, farmers who accessed all available forms of support maintained a positive level of profitability.

The results of this analysis confirm that the integration of several forms of financial support into the economic structure of farms contributes significantly to increasing their sustainability and reducing the financial risks generated by the volatility of the agricultural market.

Figure 2 also highlights the share of subsidies

in farm income for each crop according to the support scenarios analyzed. It shows the following:

-*Scenario 1*, subsidies account for about 10-11% of income, with little impact on economic stability.

-*Scenario 2*, which also includes the eco-scheme, the share of subsidies increases to 16-17%, indicating a more substantial financial support.

-The highest impact is observed in Scenario 3, where subsidies contribute more than 31% of income for most crops, underlining the essential role of this support in ensuring the economic viability of farms.

This confirms the essential role of CAP subsidies in maintaining farm profitability, especially in a volatile agricultural environment.

Applying each scenario to the farm reality regarding performance and average income per hectare, we obtain the following results:

(i) The average yield per hectare is directly influenced by the climatic conditions of the analysis years.

(ii) Selling prices follow the favorable or unfavorable conjuncture on international markets.

(iii) Production costs per hectare are mainly influenced by the sowing and fertilization technological link (Figure 3).

(iv) The average income per hectare in relation to production expenses (direct technical expenses) ranges from 4,429 lei for wheat to 5,665 lei for rape,

(v) The gross margin per hectare varies between 2,252 lei for maize and 3,946 lei for rape.

(vi) Operational expenses per hectare are dominated by depreciation and wages (Figure 4).

(vii) The average gross profit before subsidies is generally between - 415 lei for maize and 1,280 lei for rapeseed.

Scenario 1 applied to the gross margin determines a profit per hectare between -691.8 lei/ha and 2,680.96 lei/ha.

Scenario 2 - applied to the gross margin determines a profit per hectare between -191,8 lei/ha and 3,180.96 lei/ha,

Scenario 3 - generates the highest values, with a profit per hectare between 608.2 lei/ha and 3,980.96 lei/ha.

Figure 3 and Figure 4 present the average distribution of production and operational costs, highlighting the main components that influence farm profitability. These data underline the impact that access to finance and effective cost management have on the economic efficiency of farms, particularly in the context of volatile agricultural markets.

The results obtained substantiate the role and importance of subsidies for agricultural production, we observe that they represent the main source of profit for farms. The results of this paper provide information for decision-maker in the area of agricultural policy and for decision-markers on the farm.

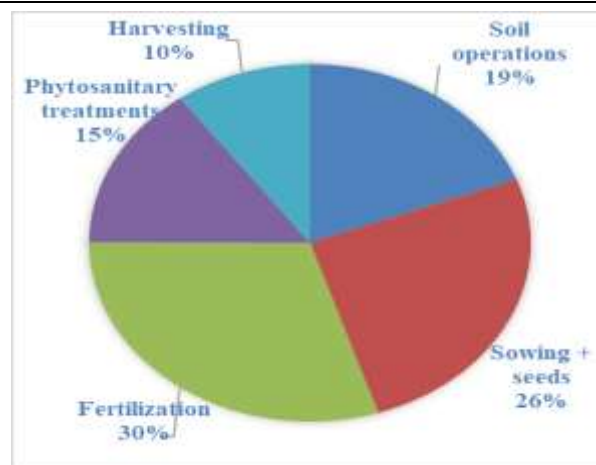


Fig. 3. Production costs [%].

Source: Own calculations.

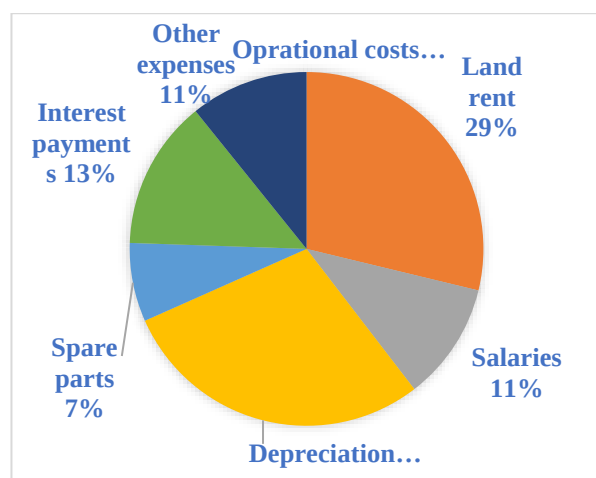


Fig.4. Operational costs [%]

Source: Own calculations.

CONCLUSIONS

"What is the impact of CAP subsidies on farmers' incomes and the profitability of agricultural production?"

This was the central question that the present study aimed to answer through a comparative analysis of different financial support scenarios. The results show that CAP subsidies play a decisive role in maintaining the economic stability of farms, and that in their absence some crops would have been unprofitable in difficult agricultural years.

The application of the economic scenarios revealed significant differences depending on the type and level of financial support accessed. Scenario 1 mitigates losses but is not sufficient to ensure profitability in bad years. Scenario 2 contributes to increased financial stability and Scenario 3 generates the highest profits, demonstrating that integrating multiple

forms of support is an effective strategy to reduce farmers' economic vulnerability. Based on the results obtained, the study formulates the following directions for optimizing agricultural policies:

- Improve the implementation mechanisms of ecoschemes, by adapting the eligibility criteria and increasing the flexibility of the techno-economic conditions so that they are more accessible to farmers without compromising sustainability objectives.

- Adapt financial support to agricultural market fluctuations by implementing flexible mechanisms to mitigate the impact of price volatility and unfavorable climatic conditions. These results underline the need for an adaptable agricultural policy that provides not only financial support, but also measures to make farms more resilient to economic and climatic risks. The answer to the original question confirms that CAP subsidies are a fundamental pillar in maintaining the economic equilibrium of farms and stabilizing the agricultural sector. In this context, optimizing the support mechanisms can contribute to a fairer distribution of funds and increase the competitiveness of Romanian agriculture.

REFERENCES

[1]Agency for Payments and Intervention for Agriculture (APIA), 2020. 2020 APIA Annual Report. Bucharest: Ministry of Agriculture and Rural Development. <https://apia.org.ro>, Accessed on November 10, 2024.

[2]Agricultural Payments and Intervention Agency (APIA), 2021, Annual Report APIA 2021. București: Ministry of Agriculture and Rural Development. <https://apia.org.ro>, Accessed on November 11, 2024.

[3]Agricultural Payments and Intervention Agency (APIA), 2022, APIA Annual Report 2022. Bucharest: Ministry of Agriculture and Rural Development. <https://apia.org.ro>, Accessed on November 11, 2024.

[4]Agricultural Payments and Intervention Agency (APIA), 2023, APIA Annual Report 2023. București: Ministry of Agriculture and Rural Development. <https://apia.org.ro>, Accessed on November 11, 2024.

[5]Alexandri, C., Luca, L., 2019, Assessing the impact of direct payments on farm viability by size and specialization. In Activity report of the Institute of Agricultural Economics. București: Institute of Agricultural Economics. <https://www.eadr.ro/fisiere/IEAraport2021.pdf>. Accessed on November 16, 2024.

[6]Brînar, A.I., Dona, I., 2016, analysis of the support mechanism of the pillar i and the results in the Romanian agricultural exploitations South-Muntenia region. Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development", Vol. 16(2), 43-48.

[7]Chitea, L. 2024, Main measures for small farms after the accession to the European Union through the National Rural Development Program . Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development", Vol. 24(3), 181-190.

[8]Chiurciu, I., Varutoiu, M., 2023, European funding within sub-measure 6.1. Case study applied in Hunedoara county, Romania. Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development", Vol. 23(1), 147-152.

[9]European Commission, 2023, Key objectives of the CAP 2023-2027. Brussels: Directorate-General for Agriculture and Rural Development. https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-2023-27/key-policy-objectives-cap-2023-27_ro Accessed on November 16, 2024.

[10]European Commission, 2023, CAP Strategic Plan 2023-2027 for Romania. Brussels: Directorate-General for Agriculture and Rural Development. <https://agriculture.ec.europa.eu>. Accessed on November 16, 2024.

[11]Galluzzo, N., 2016, Analysis of subsidies allocated by the common agricultural policy and cropping specialization in Romanian farms using FADN dataset. Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development", Vol. 16(1), 157-164.

[12]Lascăr, E. 2014, The role of subsidies in the rural development of South-Muntenia region. Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development", Vol. 14(1), 179-182.

[13]Ministry of Agriculture and Rural Development (MADR), 2023, Data on agricultural subsidies and farm structure in Romania. Bucharest: MADR. <https://madr.ro> Accessed on November 15, 2024.

[14]Ministry of Agriculture and Rural Development (MADR), 2023. Average prices of agricultural products 2020-2023. București: MADR. <https://madr.ro>. Accessed on November 15, 2024.

[15]National Statistical Institute (NSI), 2023, Database Tempo Online - Agricultural production and cultivated areas in Romania. Bucharest: INS. <https://insse.ro>. Accessed on November 15, 2024.