Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 25, Issue 1, 2025
PRINT ISSN 2284-7995, E-ISSN 2285-3952

THE IMPORTANCE OF RISK MANAGEMENT CONCEPT FOR AGRICULTURAL BUSINESS

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Abstract

Risk in the agricultural sector remains one of the most current and important concepts to research, taking into account the importance of this sector worldwide, a sector that faces increasingly greater challenges in terms of ensuring global socio-economic stability, but especially in supporting and fulfilling people's primary need, that of having access to food. We face an urgent need for innovative strategies to manage risks and mitigate losses, and risk management is essential to control costs and ensure stability of farmers' incomes, especially in an area exposed to major risks. The purpose of this research is to find out what are the main sources of risk in this sector, what are the risk management tools preferred by farmers, but also the current state of the agricultural sector at European level. Regarding the research method, we used direct observation and statistical description to search for information, identify indicators and conduct their analysis. Thus, the economic indicators showed the major differences between countries and the reasons why some states fail to keep up with others. Also, it was noticed that countries willing to adapt to economic changes and use technology processes in the agricultural sector have much better results and significantly higher growth than others.

Key words**:** *risk management, agricultural sector, risk strategies, European Union*

INTRODUCTION

Risk, in a broad sense**,** refers to an uncertainty or the possibility that a certain hazard will occur. There is no universally accepted definition of risk, it's being conceptualized in the literature as expected value, probability distribution, uncertainty or event. Common definitions include: risk as expected loss [1], expected disutility, the probability of a negative outcome, predicting the chances of occurrence and severity of adverse effects, combining the possibilities of occurrence of these effects with the level of severity to which the consequences could reach, the triplet (scenario, probability, consequence), a multidimensional association of negative incidents/outcomes and the uncertainties that come with them, the uncertainty of the outcome of actions and events, a situation or event in which human values are involved and whose outcome is uncertain, as well as an unexpected consequence of an event or activity [22]. These definitions can be structured and understood from two perspectives:
(1) risk quantified through probabilistic methods and expected values and
(2)risk conceptualized through the relationship between events, consequences and uncertainties.

Risk management in agriculture involves the identification and assessment of possible sources of risk, a process that contributes to the adoption of measures aimed at reducing the negative impact. Management, performance and learning could reduce risk [26]. The main objective is to prevent or reduce losses in the agricultural sector, both in plant and livestock production, caused by controllable or uncontrollable factors. Research in this field aims to help make better decisions in the future, taking into account the new types of risks that arise with the development of various fields, such as technology, which can expose farmers to risks that are difficult to control and predict. The

more complex the risk, the harder it is for farmers to make an appropriate decision [15].
Therefore, „*agriculture has become increasingly risky as farmers have become increasingly commercial, forcing them to understand risk and develop risk management skills to better anticipate problems and reduce losses"* [21].
More than this, even the projects carried out with the EU for funding agriculture involves risks [19]. In this context, the aim of the study is to identify the main sources of risk in agriculture, which are the risk management tools preferred by farmers, and also to assess the current state of the agricultural sector at the European level.

MATERIALS AND METHODS

The article is based on a bibliographic study destined to identify the main sources of risk and the strategies used to prevent them.
At the same time, the data provided by the European Union for the agricultural sector was also researched, analyzing the situation of agricultural holdings. There were researched indicators such as: economic dimension of farms, the use of agricultural areas in 2020 and the net entrepreneurial income from agriculture in order to have an overview about the current situation in European countries compared to Romania and, also, about the factors that influence these differences.
The current tools used to study the risk management in agriculture were another important point to research in order to find out, based on the existing scientific literature, which risk mitigation methods are most used by farmers and why.

RESULTS AND DISCUSSIONS

In a general perspective, risk management is the process of reducing losses that aims to improve final results and performance, which arose from people's desire to rely on their own strengths and to be able to control or prevent certain events.
So, *risk management includes all processes regarding risk identification, assessment, establishing responsibilities, taking measures to mitigate or anticipate them, periodic review and progress monitoring* [24] .
The agricultural sector faces an increasing need to identify innovative strategies for a better risk management in order to reduce losses.
Although risk exists in every field, the agricultural sector is exposed to increasing uncertainty, which does not give farmers the courage to think and invest in the long term.
The steps in the correct application of risk management are detailed in the Table 1, each with its specific role.

Table 1. Stages of risk management

1. identification of risk typologies and their origin;
2. prediction of the chances of occurrence, the level of severity and the consequences associated with the types of risks identified (risk analysis);
3. create risk reduction and prevention plans (assessment of the risks involved);
4. to track the progress and effectiveness of risk treatment actions (follow-up);
5. to make decisions about risks (communication and reporting).

Source: data processing from the methodology.

Table 2. The main risk categories in the agricultural sector

Types of risk	Detailing
Production risks	climate change (drought, floods, storms, excessive rain, extreme temperature variations, strong winds, hail), due to diseases and pests affecting plants and animals, but also due to pollution.
Marketing risks	loss of market visibility and decreased revenue due to competitors, competitive pricing, consumer preferences, loss of market access due to non-compliance with market and packaging standards.
Market risks	falling output prices and rising input prices
Institutional risks	change in government policies, agricultural policies, quality standards, contracts and non-compliance thereof
Human risks	deaths, lack of professional training, lack of qualified staff, lack of poor communication, lack of guidance and people management skills
Financial risks	increase in the cost of capital, increase in input prices, lack of liquidity, decrease in share prices, exchange rate risks, lack of income to support financial obligations, increase in interest rates
Technological risks	lack of educational training, reluctance to change and use new technologies, high costs, small farm size, poor or non-existent access to finance or credit.

Source: data processing from the methodology.

Main risk categories identified in scientific articles and literature studies refers to production risks, marketing risks, market risks, institutional risks, human risks, financial risks, technological risks [22, 17, 16, 2]. All these types of risk are detailed in Table 2.

The agricultural sector faces several interrelated risks, but from of all these risks, **price and production risks are usually considered the most significant** challenges for farmers in effectively managing their operations.

Climate change will intensify extreme weather events, affecting yields and global structural imbalances between supply and demand, such as population growth and resource scarcity, will increase price variability.

Table 3 presents the tools available for risk management in agriculture, depending on the type of strategy and provider **[**25].

It is important to take into account the interactions between the tools. Some tools prevent the use of others, reducing the marginal gains for the farmer.

For example, the safety of some insurance schemes reduces the use of production diversification; or the existence of strong revenue coverage reduces or even eliminates the demand for price coverage.

Table 3. Tools available for risk management in the agricultural sector

	Farm/ household/ community	**Market**	**Government**
Risk reduction	Adoption of technological solutions	Training programs for risk management	-Macroeconomic policies -Disaster prevention (flood control) -Prevention of animal diseases
Risk mitigation	- Diversification of production - Sharing cultures	-Floods and options -insurance -Vertical integration -Contracts in production or marketing -Distribution of sales (throughout the year) -Diversified financial investments -Work off the farm	-Smoothing the income of the fiscal system -Countercyclical programs -Quarantine measures 629 and other measures in case of outbreak of a contagious disease
Dealing with risk	Borrow from neighbors/family	-Sale of financial assets -Saving/borrowing from banks -Off-farm income	-Disaster support -Social assistance -Support programs for agriculture

Source: data processing from the methodology.

As a result of research carried out by ***Deutsche Bank Research*** in 2010, which aimed to survey several agricultural producers in five countries, Germany, Hungary, Poland, the Netherlands and Spain, to obtain responses regarding their perceptions and practices of risk management, it was found that farmers prefer the following risk management solutions:

-*property and crop insurance* (holding financial reserves and avoiding credit)

-*vertical integration and marketing agreements.*

Credit avoidance is used by about 40% of surveyed farmers and is equally important in all countries. Insurance is used most often in Spain and Germany (60-70% of farmers), a phenomenon explained by the high level of public subsidies in Spain (49%), and in Germany by a general tendency to resort to insurance [25].

Hedging is another risk management strategy used to offset investment losses by taking an opposite position in a related asset. The reduction in risk provided by hedging usually results in a reduction in potential profits [18].This strategy works as a kind of insurance policy, offsetting any steep losses in other investments. This strategy is used the most in Germany, but, overall, it is a very

rarely used method in the countries of the European Union (5%).

Most farmers seem to be more interested in continuing to use classic risk management methods, which shows a reluctance to change considerably. Interest in the use of new technologies and hedging is more prevalent among farmers who own larger farms: " *About 30% of farmers on medium and large farms intend to engage in hedging, as opposed to 15% of smaller farm owners*" [11].

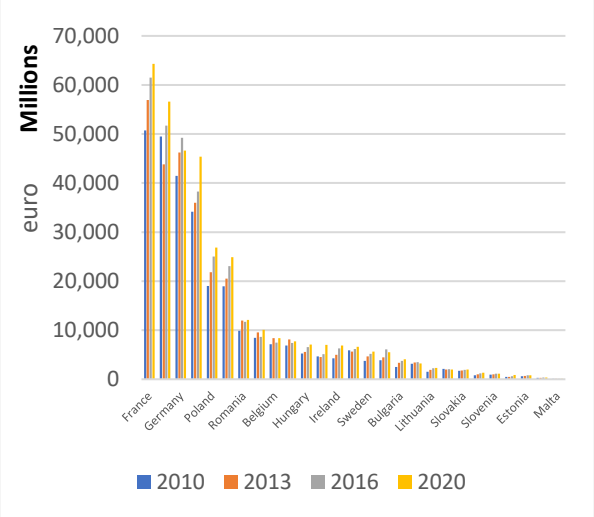

Fig. 1. Analysis of the economic size of the farm through the standard production indicator per EU country
Source: [8].

As can be seen from the results obtained from the analysis presented in Fig. 1, the economic indicators of farms in Bulgaria and Romania have recorded a significant increase, especially from the economic perspectives of farms, which shows that there is development potential for these countries. Bulgaria has seen an increase from €2.5 billion in 2010 to over €4 billion in 2020, which shows a substantial improvement in the economic performance of farms. Similarly, Romania has seen an increase from almost €9.9 billion in 2010 to over €12 billion in 2020.

Romania continues to be acknowledged by the European Union member states as a key player in the agricultural sector, as evidenced by the cultivated agricultural land and the yields achieved [28].

These increases can be associated with the expansion of the agricultural area used, investments in agricultural technology and changes in farm management, potentially including a diversification of the age and gender structures of managers [9, 10].

Also, "farmers' experience is an extremely important indicator of their work and performance" [17].

From the analysis of the number and distribution of agricultural holdings presented in Fig. 2, significant variations can be observed between the different European countries.

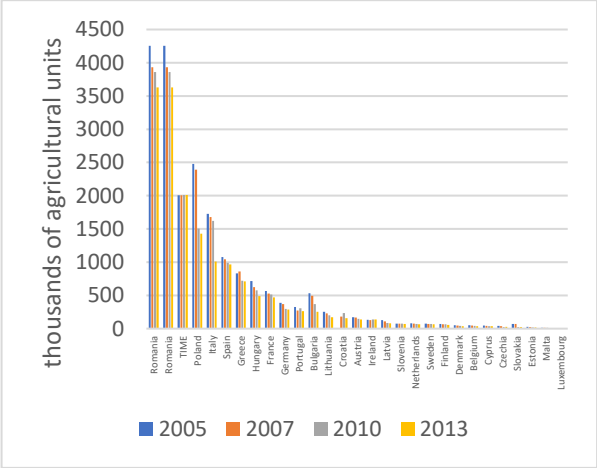

Fig. 2. Agricultural holdings according to the economic size of the farm (standard production in Euros**)**
Source: [11].

Regarding the economic size of the farms in the EU, in standard output, it was found that in Romania, most farms (3,071 thousand out of a total of 3,629.68 thousand) have a standard production below 4,000 euros, indicating an agricultural sector dominated by small farms. The same trend is observed in Poland, where 686 thousand farms out of a total of 1,429 thousand fall into this category.

In contrast, Germany and France have a significantly lower number of small farms, with only 8 thousand and 55.4 thousand farms under 4,000 euros respectively, but have a higher proportion of farms with larger economic sizes, indicating a more consolidated and more mechanized [11].

The analysis highlights the diversity of the agricultural structure in Europe (Fig. 3). For example, Romania, with a total agricultural area of 14,734,040 hectares and 12,565,500 hectares of UAA, it is one of the countries that can boast the largest agricultural areas, paying a significant importance to arable land, which

totals an area of 8,570,730 hectares and permanent pastures (3,723,530 hectares).
At the same time, the area dedicated to permanent crops and kitchen gardens is relatively small, indicating a major orientation towards extensive crops.

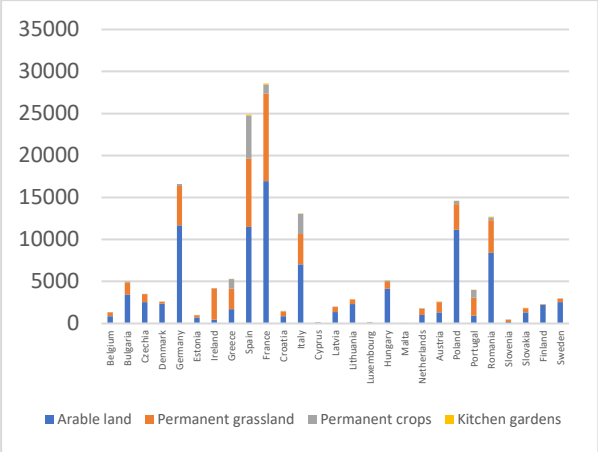

Fig. 3. Main use of agricultural land by category in 2023
Source: [12].

Western European countries such as France and Germany have well-established and diversified agricultural structures. In comparison, smaller and island countries such as Malta and Cyprus have smaller agricultural areas, but with intensive and specialized uses.
These variations underline the influence of climatic conditions, agricultural policies and local traditions on the structure and use of agricultural land in different European regions [13].

EU support in risk management and mitigation in agriculture

Access to European funds for agriculture has played and continues to play an extremely important role in the development of agricultural holdings and rural areas [23].
The multi-annual financial framework 2014-2020 included expenses in the amount of 408,313 billion euros (Table 4).

Table 4. Distribution of CAP expenses in 2027 compared to 2020

Year	Direct payments	Rural development	Market measures
2020	71.3%	24.4%	4.3%
2027	72%	25%	3%

Source: European Parliament, 2023, Financing of the CAP: facts and figures [4], [3].

For 2020-2027, the CAP expenses account for 386.602,8 million euros, targeting the transition towards a sustainable agriculture and forestry in EU countries.
Although the budget breakdown has undergone minor changes, we can see that income stabilisation and rural development are still priorities for the CAP.
As a result of supporting and respecting the CAP priorities, in December 2020, according to the budget plan allocated by the EU to support the agricultural sector, farmers benefited from funding equivalent to 31% of the total European Union budget. Rural development measures will benefit from an additional support which represent approximately €8.1 billion from the *Next Generation EU (NGEU)*, program which was allocated for post-COVID-19 revitalization of the economy and society, increasing the total value of financial support provided to beneficiaries for the 2021-2027 period amounts to €386.6 billion [4].
As described by the European Commission, direct payments provide basic income support for EU farmers. The income support function of direct payments contributes to long-term economic viability and a smooth structural adjustment of the agricultural sector [14].
Also, the European Parliament issued*(a)"Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 lays down rules for support to Member States in drawing up strategic plans under the Common Agricultural Policy (CAP), to be financed by the European Agricultural Guarantee Fund (EAGF), in accordance with Regulations (EU) No 1305/2013 and (EU) No 1307/2013."* [5].
(b)"Regulation (EU) 2021/2116 of the European Parliament and of the Council of 2 December 2021 on the financing, management and monitoring of the common agricultural policy and repealing Regulation (EU) No 1306/2013" [6].
(c)"Regulation (EU) 2021/2117 of the European Parliament and of the Council of 2 December 2021 amends Regulation (EU) No 1308/2013 establishing a single market management system for agricultural products, as well as Regulation (EU) No 1151/2012 on

quality schemes for agricultural products, Regulation (EU) No 228/2013 laying down specific measures for agriculture in the outermost regions of the EU and laying down rules on the labeling, presentation and protection of geographical indications of aromatized wine products" [7].

Table 5. EU-27 CAP budget for engagement credits in 2021 and in the Multiannual Financial Framework 2021-2027 (Euro Million)

CAP BUDGET, EU-27 (commitment appropriations - EUR million at current prices)	(A) Year 2021	(B) Multiannual financial framework 2021-2027 (MFF)	% (B)
(1) CAP PILLAR 1 Direct payments and agricultural market measures	40 368.0	290 534.0	76.8%
(2) CAP PILLAR 2 (2a) Rural development measures under MFF	15 345.0	87 998.3	23.2%
(2b) Additional rural development measures under NGEU (temporary recovery instrument)	2 387.7	8 070.5	---
(3) TOTAL CAP 2021-2027, EU-27 [(1) + (2a)]	55 713.0	378 532.3	100%
(4) TOTAL EU COMMITMENTS	168 496.0	1 221 719.5	---
(5) % of CAP [(3) / (4)]	33.1%	31.0%	---
(6) TOTAL CAP: MFF 2021-2027 + NGEU 2021-2022 [(1) + (2a) + (2b)]	58 100.7	386 602.8	---
(7) TOTAL MFF 2021-2027 + NGEU 2021-2022	333 108.9	1 642 788.7	---
(8) % of CAP [(5) / (6)]	17.4%	23.5%	---

Source: [4].

By means of these regulations, a new performance model was created for the agricultural sector in order to obtain the financial support offered by the CAP, a model that is based on the national strategic plans made by each member state. The new CAP legislation targets performance and results, opting for a tailored approach with the aim of giving Member States greater flexibility in implementing the policy at local level [23].

At the same time, *the introduction of European standards in agriculture, the rules that favor intensive agriculture and limit the production of certain traditional agricultural goods, is expected to have a negative impact in countries with a tradition of small-scale agricultural production* [27, 20].

CONCLUSIONS

Effective risk management is crucial for stabilizing and strengthening the agricultural sector. Through this research, we examined the primary sources of risk in agriculture, identified current management tools and analyzed their applicability in different EU countries. The results suggest that while current risk management strategies focus heavily on yield variability, there is an under emphasis on price stabilization, which remains a critical gap in supporting long-term agricultural stability. In addition, the observed reluctance to adopt new risk management technologies highlights the need for increased education and support mechanisms, especially for smaller farms.

Agricultural risk management tools in Europe have mostly focused on yield variability (marketing excess production, technological innovation and yield insurance) and neglected

price stabilization tools such as futures and forward contracts, storage options and management.

Our analysis highlights the importance of an adaptive risk management framework that integrates both traditional and innovative approaches, addressing production and market risks alongside climate change-induced uncertainties. For policymakers, the continued refinement of the Common Agricultural Policy (CAP) offers a way not only to stabilize agricultural incomes, but also to foster resilience in the face of evolving global and environmental challenges. As the sector progresses, aligning risk management tools to the diverse needs of farms will be the key to promote a sustainable and productive agricultural landscape across Europe.

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