

Opportunities and challenges for managers within the East-European agriculture sector: Case study on Romania

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Abstract: Agriculture has always been essential to the development of human society, providing the food necessary for human survival. For the Romanian economy, agriculture is a very important sector in terms of the number of enterprises involved and the agricultural area used, but also because of the workforce employed in the sector. However, Romanian agriculture is a vulnerable sector, which has had to face several unfavourable events in recent years. The COVID-19 pandemic, the energy crisis, the conflict in Ukraine, and the lack of agricultural inputs have brought many risks for Romanian farmers in 2023, such as higher food prices and more expensive electricity for consumers. This paper aims to identify the perceptions of the managers regarding the outcomes of the recent events (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) on the future potential of agriculture in Romania and to determine their perceptions about the impact of other issues with which agricultural companies had to deal with in recent years (climate change, draught, inflation, governmental measures). Other goals of the paper were to find out the managers' plans and prospects to potentially introduce or use new technologies and digitization within their own companies and uncover their assessments regarding the sector's future within the European and international context. To identify these perspectives, qualitative research was carried out through in-depth interviews with respondents holding leadership positions within 16 Romanian agricultural companies. The data was analyzed in order to identify similarities and discrepancies within their statements and find corroborative ideas that could help improve the sector. The results of the paper showed how the COVID-19 pandemic and the unstable geo-political context along with other issues increased production costs, but favored digitization and technology. In the past years, because different events changed the European and Romanian economy, a lot of academic research has revolved around the areas of health, energy and technology. Therefore, the study brings elements of originality because of the theme and the approach, which provide valuable insights not only for Romania but for other countries in the region as well.

Keywords: Energy crisis, geo-political instability, COVID-19 pandemic, agricultural production, food security, climate change, draught, inflation.

JEL Classification: Q10, Q18, M11, M12, F18.

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Introduction

The years between 2019 and 2024 have been agitated with a pandemic and geo-political conflicts having significant social and economic impacts (Dinca et al., 2023). There could be much to discuss about this decade's unpredictable events, their aftermath, and the measures taken to deal with them, e.g., the outcomes of the COVID-19 pandemic for health and other complementary sectors or the discontinuations with the supply chain, and rising prices for energy and food caused by Russia's invasion of Ukraine (European 2030 Resolution Foundation, 2023).

Following the outbreak of the COVID-19 pandemic, world governments have taken different measures aiming at impeding or even ending the spread of the virus. The main measures include: national lockdowns along with social distancing, closing educational institutions by implementing home school programs, the introduction of travel alerts customs restrictions for people originating from certain countries deeply affected by the pandemic, increasing imports and production of medical equipment (e.g., ventilators, masks) and the number of employees in the medical field, increasing the number of police and army interventions, restrictions for public transportation, and offering and receiving international support, whether medical or financial. However, even though these measures taken by world governments had their benefits for public health, they have proven to show their disadvantages, both socially and economically (Haug et al., 2020). In order to recalibrate the economies of countries, world governments have introduced a series of fiscal measures to recover the status of different economic domains (Vămănescu et al., 2023). Thus, refundable and non-refundable loans were introduced in various countries for the sectors severely affected by the pandemic, such as tourism or transport, which received financial support from governments.

Succeeding the COVID-19 pandemic and the conflict between Russia and Ukraine, increased inflation on food, agricultural products,

energy and manufacturing goods can be identified worldwide and the inflation rate remains a significant indicator showing the general state of the economy (Buheji, 2022). In the period following the COVID-19 pandemic and the conflict in Ukraine, Romania experienced a period similar to the stagflation of 1974–1982 due to very high energy prices (Wang, 2023). It is important to emphasize that the increase in inflation causes an increase in global poverty, which in turn causes social inequality, a high unemployment rate and overall financial instability, because the purchasing power of the population decreases dramatically.

The agricultural sector has been impacted globally, both by the measures taken by governments against the COVID-19 pandemic, by the conflict in Ukraine, by the overall economic decline, but also by environmental factors such as climate change or global warming. An important factor for reshaping and boosting agriculture could be the implementation of digital technologies in this sector.

Since agriculture is a vital industry for the world economy and for the above-mentioned food industry, it has a major impact on economic growth, employment and the development of rural communities. However, the Romanian agriculture is characterized by low productivity compared to its potential and the measures that could be taken in order to surpass those difficulties have not been researched enough in the last years.

Therefore, within this research gap, the purpose of this article is to determine the impact of the multiple recent events (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) on the agriculture in Romania. The main research question of the paper is: What vulnerabilities have recent events (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) brought to the agriculture in Romania and what measures could be taken and implemented in order to strengthen it? The aim was to identify the impact on production processes, on exports, sales but also on the overall economic activity of Romanian

agricultural companies. Through the qualitative research in which managers from agricultural firms in Romania were interviewed, there were identified the threats and opportunities triggered by the current economic context (of the region as well), but also if Romania is prepared for a future that will be shaped by sustainability.

1. Theoretical background

The last few years have been tense due to pandemic and political-military conflicts affecting social and economic systems. Extensive high-priority policies have been carried out as counteraction of these unforeseen events.

The COVID-19 pandemic triggered a socio-economic crisis along with a health one and its consequences are challenging and wide-ranging on a global level (Jambor et al., 2020). In order for the pandemic to be controlled worldwide, travel restriction measures were introduced, which decreased productivity in companies as well as trade in goods and services (Zhang & Ma, 2020). National governments in many countries have taken various measures to control this health crisis, which made the process of import and export of food very difficult (Gherasimescu et al., 2023). Among many sectors, such as tourism or transportation (especially by plane), the food and agriculture sectors were deeply affected by the lockdown measures (Hamid & Mir, 2021). Many countries temporarily suspended exports with the aim of protecting food stocks in local markets, generating global food insecurity (Aker, 2020). However, concomitantly, governments and central banks had to think about measures to recover the economy. Therefore, the COVID-19 pandemic changed the way businesses were run worldwide (Badan & Petre, 2020). Numerous global companies have had to reanalyze their risks, priorities, and strategies for the future (Nakat & Bou-Mitri, 2021). As positive aspects of the health crisis, among the most important which can be mentioned are the fact that numerous imports were replaced by domestic products and the creation and growth of more online companies (Dinu et al., 2021; Jiang et al., 2020).

Another impactful event starting in the 2020s was Russia's invasion of Ukraine and it has generated severe repercussions in the international energy markets, including price instability, stocks' deficit, problems in the defense and economic incertitude. It is estimated that

higher energy costs are going to lead to rising prices of goods and services (Yin et al., 2023). One implicitly positive input of increasing fossil fuel prices is they offer a strong motivation to speed up the transition towards sustainable alternatives (Reglobal, 2022).

The side effects of COVID-19, combined with those triggered by the conflict in Ukraine, could have strong repercussions for individuals, business sectors, and countries, including geopolitical tension, increased costs, energy sector impasse, and a slowdown in global economic growth (Xing et al. 2023). The conflict in Ukraine has brought many challenges to the agricultural sector in 2023, and imports of cheap cereals and oilseeds from Ukraine have had a negative impact on the incomes of Romanian farmers, who have faced low prices, unfair market competition and increasing difficulties in financing agricultural activity (Istudor et al., 2021).

For the EU, the constant changes within the energy sector have represented a priority in the last five years and extensive action measures have been implemented at the EU level and by EU member states in this sense. The agricultural sector, which stands as an essential one for EU rural areas, uses large amounts of energy, and therefore it is deeply affected by the high energy prices (European Economic and Social Committee, 2023).

Climate change also negatively affects biodiversity by threatening the expansion of animal species. Human health is also affected, as deaths are recorded in 2023 due to the extreme climate in several regions of the globe. In addition, drastic modifications of climate may cause human health conditions, such as asthma, cardiovascular diseases, malaria, dengue, respiratory allergies, malnutrition, or heart attacks. Tourism is threatened by climate change and global warming, because certain areas of the world become impossible to visit during the summer holidays due to extremely high temperatures. The winter ski season is also affected by the fact that the amount of snow has decreased compared to previous decades.

To support the planet in the fight against climate change, short- and long-term actions are necessary. Short-term measures consist of education among farmers, forest protection, sustainable tourism development and energy efficiency (Micu et al., 2022). On the other hand, long-term measures against climate change include smart agriculture, biodiversity and

ecosystem conservation, reducing deforestation and using green energy (Raihan, 2023).

In Romania, the climate is characterized by changes of the seasons, by mild winters and increased air temperature, and by the desertification of the areas where wheat, oats and sunflowers, are cultivated, but also by extreme phenomena, such as gusts, storms and blizzards. In the last 40 years, the temperature of Romania increased by +2°C (Popescu et al., 2023). Simultaneously, in terms of informing Romanian farmers about the reduction of carbon emissions and pollution, there are too few initiatives. With the country's accession to the European Union (in 2007), farmers followed trainings and preparations on this subject, but still, the interest regarding this subject remains reduced.

It is worth noting that the pandemic represented a great accelerator of different modern technologies. Examples are Google, Facebook, TikTok, WhatsApp or Instagram platforms. These tools are free and can increase the popularity of businesses, that being the reason for them attracting a large number of users (Uşaklıoğlu, 2020).

By digitalization, other technological concepts are also comprised, such as robots, smartphones, artificial intelligence (AI), 3-D printers, 5G industry and other innovative ways of doing business (Amankwah-Amoah et al., 2021).

In 2022, the Digital economy and society index (DESI) ranked Romania as 27th out of 27 in the European Union (Fig. 1), in terms of human capital in digitization, connectivity, integration of digital technology and digital public services (Popa & Turek Rahoveanu, 2021). This position is due to the government's lack of interest in this branch, the lack of planning of the digitization process at a national level, and the reduced efficiency of institutions in this direction. In order to accelerate these processes, in 2020, the Authority for the Digitization of Romania (ADR) was established in Romania, being subordinate to the government.

For Romania, the digitalization of companies would benefit the country's economy by contributing approximately EUR 42 billion to the GDP until 2025. The COVID-19 pandemic highlighted Romania's lack of digital education and the fact that the population lacks the skills to use technology in various administrative sectors, such as educational, medical or social (Panait & Rădoi, 2022).

The 5G industry represents the future of the digital economy, which will spur global development by creating new job opportunities. The 5G era aims to connect people, machines, to facilitate the medical, agricultural, educational, transport system, and to facilitate access to education and culture. The agricultural sector can be supported by the 5G industry, through the development of sensors

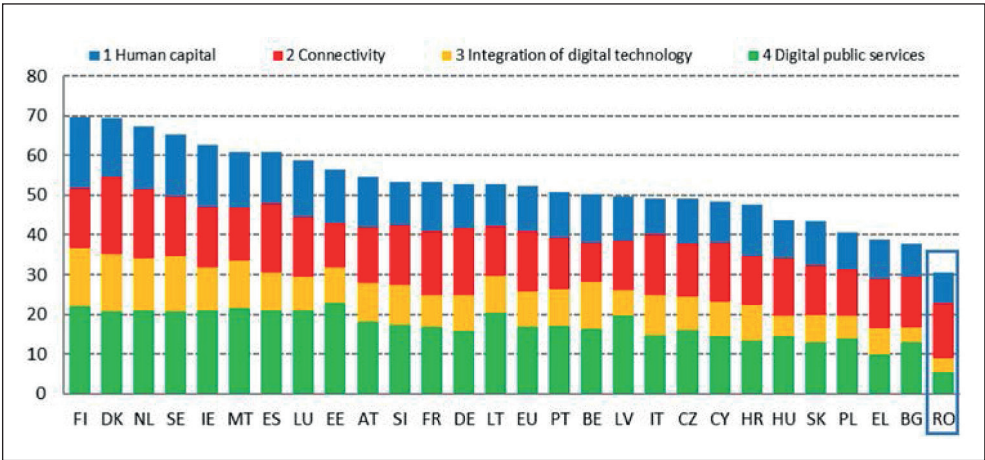


Fig. 1: Digital economy and society index (DESI) 2022 ranking

Source: <https://digital-strategy.ec.europa.eu/en/policies/desi-romania>

in farms (identification of humidity, topography, animal health), the development of the irrigation system, soil and harvest monitoring, but also through the use of agricultural drones (Ionescu et al., 2021).

2. Research methodology

In order to better understand the economic activity and the potential challenges within Romanian agricultural companies, the way they were impacted by exogenous shocks (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) and their perspectives for the future, a qualitative study was conducted using in-depth interviews. In-depth interviews are frequently applied when conducting research of an exploratory nature and, in particular, when the researchers want detailed information about the respondents' opinions and wish to explore new issues in depth. Interviews are often used to provide context to other (secondary) data, offering a more complete picture of a specific topic or subject (Andrei et al., 2021; Gârdan et al., 2018). The goal of the research was to explore the various facets of the agricultural sector, such as the production process and costs, delivery, imports, exports, sales, but also the advantages of new technologies and digitalization. Specific objectives are to:

- Identify the opinions of the managers regarding the repercussions of the recent events (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) on the future potential of agriculture in Romania;
- Determine the perceptions of the managers on the impact of other issues with which agricultural companies had to deal with in recent years (climate change, draught, inflation, governmental measures);
- Find out the plans and the prospects of the managers to potentially introduce or use new technologies and digitization within their own companies;
- Uncover the opinions of the managers regarding the future of the sector within the European and international context.

The qualitative research method allows relevant information to be obtained through interviews, with the in-depth interview technique being applied. The use of this technique is appropriate in relation to the study's goal and the researchers' target to find out in a clear and explicit manner the opinions and perceptions of agriculture business owners or directors.

In most cases, qualitative research includes an unstructured, exploratory methodology based on small samples, able to offer much more detailed information than what is available through other data collection methods, such as surveys (specific for quantitative research) (Epuran et al., 2018).

The in-depth interview allows a qualitative understanding of the causes and motivations underlying the phenomena studied and the social reality of their organizations (Gârdan et al., 2018).

In the context of this study, a partially structured interview guide was chosen, with pre-established discussion topics in a particular framework. Even if there is already a pre-established arrangement of questions, the researchers had the freedom to insert supplementary questions. Also, for this study, which is exploratory in nature, the use of a semi-structured interview guide is justified, as the greatest possible flexibility is needed to allow the most diverse information to be obtained (Pîrvu et al., 2024).

The sample was chosen from the pertinent statistical population consisting of Romanian entrepreneurs in the agricultural sector. The sampling design used was purposive sampling, also known in the literature as judgmental or subjective sampling; purposive sampling is a form of non-probability sampling in which researchers rely on their own judgment when choosing members of the population to participate in their surveys (Campbell et al., 2020). The selection was established through a selection questionnaire encompassing filter questions on-topic with the goals of the study. Sixteen managers were selected to participate in the interviews on a voluntary basis and interview guides were then applied to each of them. Given that qualitative research aims to explore local perceptions and subjective logic, the sample is not statistically representative, but the applicability of the results acquired through the specific structure for the situation encountered in the analysed field is ensured. Even though qualitative research is usually characterized by small sample sizes, which is also the case for this research, we ensured the sixteen participants had the appropriate backgrounds, experience and company position in order to support the depth of case-oriented analysis that is fundamental to this mode of research.

Tab. 1: Structure of the sample of respondents

Criteria of structuring the sample	Grouping the respondents depending on each criteria			
Education level and competence area	Bachelor studies in Economics (6 people)	Bachelor studies in Agronomics (4 people)	Master studies in Economics (5 persons)	Doctoral studies in Economics (1 person)
Age	30–39 years old (3 people)	40–49 years old (6 people)	50–59 years old (5 people)	60–69 years old (2 people)
Position within the company	Production manager (4 people)	Research manager (1 person)	Purchasing manager (1 person)	General manager (10 people)
Management experience in agriculture	10–15 years (4 people)	15–20 years (5 people)	20–25 years (6 people)	Over 25 years (1 person)

Source: own

The respondents came from the following agricultural sub-sectors: antimicrobial substances production, meat and egg preparations, techniques and machinery for the meat industry, poultry meat production, dairy production, cereal production, and horticulture solutions.

In order to ensure the highest possible validity of the research results, the authors followed the recommended norms of data collection based on a solid interaction between researchers and interview participants. Participants at the study were chosen if they fulfilled an imperative condition, specifically high decision-making capacity within the firm and access to basic information on the strategic orientation of the firm in question. Thus, out of the 16 people finally interviewed, the distribution of the respondents' functions was as follows: 10 general managers, 4 production managers, 1 research manager and 1 purchasing manager.

Regarding the management experience within the agricultural sector of the sample interviewed, it can be stated that: 4 respondents had between 10 and 15 years, 5 respondents between 15 and 20 years, 6 respondents between 20 and 25 years management experience and 1 respondent with over 25 years management experience (Tab. 1).

Interviews were conducted at the companies' offices or via Zoom call, depending on the availability and schedule of the respondents. The questions of the interviews focused on the impact of the COVID-19 pandemic,

the energy crisis and the conflict in Ukraine on production processes and costs, sales, delivery time, exports, imports, the workforce, but also on technology, social networks and digitization. The discussions were recorded and then transcribed, and the information was processed using the content analysis technique. The interview guide included open questions, but each question needed a mark on a 5-point Likert scale first (from strongly disagree to strongly agree) and afterward a more detailed answer into why the respondents agree or disagree with that respective statement.

The interview guide had the following structure: the first question explored how recent events (the COVID-19 pandemic, the energy crisis, and the conflict in Ukraine) have impacted the future potential of agriculture in Romania, highlighting various challenges. The second question concerned managers' perceptions regarding the impact of other issues with which agricultural companies had to deal with in recent years (climate change, draught, governmental measures and politics) on the future potential of agriculture in Romania. The third question dealt with the managers' perceptions about the plans and the prospects of the managers to potentially introduce or use new technologies and digitization within their own companies, while the fourth and last question referred to the opinions of the managers regarding the future of the sector within the European and international context.

3. Results and discussion

After transcription and centralization, the interviews were analyzed under three aspects (Cătoi, 2002): (i) vertical analysis, through the individual approach of each interview, respectively the opinions of each manager, in which the attention paid by them to the issues contained in the sub-themes of the in-depth interview was highlighted; (ii) horizontal analysis, by summarising the approach to each theme analysed by all 16 managers; and (iii) counting the answers for the questions with a 5-point Likert scale, which is related with the horizontal analysis.

The first subject of discussion addressed in the semi-structured interview guide concerned managers' perceptions regarding the consequences of the recent events (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) on the future potential of agriculture in Romania, and it represents Q1 of our research. In order to answer the first research objective, seven sub-questions were introduced in the interview guide, numbered from Q1.1 to Q1.7.

In what way have the recent events (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) impacted the future potential of agriculture in Romania, causing the following issues?

Q1.1 – Delayed the production process within the company?

Q1.2 – Increased the factory costs?

Q1.3 – Delayed in the order delivery process?

Q1.4 – Affected the sale of agricultural products?

Q1.5 – Hampered or stopped agricultural product exports?

Q1.6 – Affected the imports of agricultural raw materials (e.g., pesticides, insecticides, herbicides, fertilizers, seeds, fertilizers, fuel)?

Q1.7 – Brought challenges for the company's workforce? (cutting jobs, reducing salaries, renouncing to bonuses).

For Q1.1, regarding potential delays in the production process, the companies that participated in the study, 10 out of 16 respondents disagreed or strongly disagreed. Therefore, more than 60% of the agricultural companies subjected to the study confirmed that the production process followed its natural course in spite of the recent challenges.

Regarding the effects on the cost of the (agricultural) goods manufactured in their companies (Q1.2), 12 of the total 16 respondents

answered "agree" or "strongly agree." Therefore, more than half of the agricultural companies included in the research answered that the recent events (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) affected the factory costs.

Concerning the repercussions on the delivery process (Q1.3), delays respectively, 11 of the total 16 respondents answered "strongly disagree" or "disagree." It can be concluded that more than half of the agricultural companies participating in the study stated that the recent events (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) did not affect the delivery process.

Regarding the impact of recent events on the firm's sales (Q1.4), the answers were very mixed (8 of the respondents agreeing or strongly agreeing, while 5 disagreed or strongly disagreed).

When we analyze the answers for Q1.5, dealing with hampering or stopping product exports because of recent events (the COVID-19 pandemic, the energy crisis, and the conflict in Ukraine), the answers were again quite mixed. Seven of the respondents answered "strongly disagree" and "disagree," while eight answered "agree" and "strongly agree." The answers to this particular question are in line with the previous questions because the companies which experienced problems with sales were the ones who identified problems with exports as well.

When it comes to Q1.6 referring the impact of recent events (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) on the imports of agricultural raw materials (e.g., pesticides, insecticides, herbicides, fertilizers, seeds, fertilizers, fuel), the answers were divided. Four answered "strongly disagree" and "disagree." Four answered "indifferent" while eight answered "agree" and "strongly agree."

Regarding the impact of recent events on the labor force within the companies studied, 12 respondents mentioned "strongly disagree." All the answers in a detailed manner are presented in Tab. 2, where the subjects of Q1.1 to Q1.7 are specified within the first column and numbered from 1 to 7.

Following the content analysis, 15 respondents mentioned that some measures that could help them in a major way are improving the way subsidies are granted to small farms, stimulating farmers' associations and

Tab. 2: Breakdown of the opinions of the managers – how recent events impacted the agricultural companies in Romania

Activity affected	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Median of grouped data
1. Delaying the production process	8	2	4	2	0	5
2. Increasing the factory costs	1	2	1	8	4	2
3. Delaying the order delivery process	4	7	3	1	1	3
4. Sale of agricultural products	1	4	3	6	2	3
5. Hampering or stopping agricultural product exports	4	3	1	6	2	3
6. Affecting the imports of agricultural raw materials	3	1	4	3	5	3
7. Bringing challenges for the company's workforce	12	2	1	1	0	5

Source: own

increasing the degree of capitalisation of farms by facilitating farmers' access to credit through agricultural credit guarantee mechanisms. Thirteen respondents specified that stimulating the use of irrigation systems and their modernization and facilitating access to relevant European and national funds could be two supplementary measures that could support them in developing their activities. All these respondents referred to the year 2023 when Romania, together with five other Eastern European countries, asked the European Union for specific compensation instruments for farmers affected by cheap imports from Ukraine, receiving less than they needed.

Eleven participants said that the lack of professional training of farmers is visible and they wish for more modern vocational and technical agricultural education, which could increase the involvement of young people in agriculture by implementing schemes to support them (or facilitating access to relevant European funds) through appropriate advisory and training services. One respondent mentioned that: "Even though there are loans for financing the agricultural sector, overall, they are difficult to access and do not cover farmers' or producers' needs." Ten respondents agreed that young farmers are considered to be a potential force for Romanian agriculture and that the new

generation shows more interest in the environment than the old generation of farmers; however, one of the biggest obstacles faced by young farmers in Romania is the difficulty of renting or buying land and agricultural equipment.

The second subject of discussion (Q2) addressed in the semi-structured interview guide concerned managers' perceptions regarding the impact of other issues with which agricultural companies had to deal with in recent years (climate change, draught, governmental measures and politics) on the future potential of agriculture in Romania. In order to answer the second research objective, one main question was introduced in the interview guide.

In what way have other problems (climate change, draught, governmental measures and politics) caused bigger or smaller problems for your company in recent years? Were any of the issues mentioned in the first question encountered because of one of these causes?

It is worth mentioning that 12 out of 16 respondents stated that farmers are among those most affected by climate change and environmental degradation because food production depends on soil fertility, water quality, weather conditions and the presence of pollinators. For these reasons, farmers need to play an active role in protecting natural resources and moving towards more sustainable and

environmentally friendly agriculture. Eleven respondents mentioned the need for the European Union to continue to support them financially in adopting these recovery measures.

Ten respondents also mentioned tax evasion in the agricultural sector as a burden affecting them in the last decade and they mentioned licensing grain warehouses, optimizing taxation in the agricultural sector and regulatory measures to reduce tax evasion as potential methods to support their business progress.

The third subject of discussion (which represents Q3 of our research) addressed in the semi-structured interview guide dealt with the managers' perceptions about the plans and the prospects of the managers to potentially introduce or use new technologies and digitization within their own companies. In order to answer the third research objective, three sub-questions were introduced in the interview guide (highlighted as Q3.1, Q3.2 and Q3.3).

The first question from this section was Q3.1. In the last 3 years, have you introduced technologies in your agricultural production activity? The biggest proportion of the respondents (7 out of 16), chose to mention "indifferent" (or "neutral"), with only 6 of them agreeing or strongly agreeing. One of the respondents who agreed mentioned that he started using an ERP system in 2018, and it helped him very much to manage the production chain, from crop planning to the sale of finished products. "It not only improved operational efficiency, but also helped me reduce costs and increase profitability," he said.

When it came to promoting the activities of the company on social networks (e.g., Facebook, Instagram, LinkedIn, Twitter), which embedded the content of question Q3.2

in order to make it more visible and open to the general public (especially the younger one) 10 out of the 16 companies disagreed and strongly disagreed.

For question Q3.3 regarding the desire to reinforce the digitization of their activity in the future, no company answered "strongly disagree" and "disagree," 3 answered "indifferent," 5 answered "agree" and 9 answered "strongly agree." Therefore, most of the agricultural companies answered that they aim to digitize their activity in the future in order to develop. However, all of them mentioned that no big improvement has been made so far. All the answers in a detailed manner are presented in Tab. 3.

Fourteen out of sixteen respondents specified that both in Romania and throughout the EU, agriculture is facing a double demographic challenge: on the one hand, the ageing of the agricultural population, and on the other, fewer and fewer young people living in rural areas. This aspect makes the implementation of new technologies within the firms much harder, which was reflected in the answers to Q3.1.

More than half of them (10 respondents) concurred that the Romanian agricultural sector is facing a low level of digitization and modernization compared to other EU member states and that investments in modernization and restructuring of factories and farms along with the whole sector are needed to make agriculture competitive.

Seven respondents pointed out that they are already investing step by step in R&D and are interested in continuing to focus on seeds and genetic traits, chemical and biological solutions for crop protection, soil management, plant health, pest control and digital agriculture inspired by the fact that all these measures are already

Tab. 3: Breakdown of the opinions of the managers – the plans and prospects to potentially introduce or use new technologies and digitization within their companies

Activity developed or to be developed	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Introducing new technologies in the agricultural production activity	2	1	7	4	2
Promoting activity of the company, on social networks (e.g., Facebook, LinkedIn, Twitter)	7	3	3	2	1
Digitizing the activities of the company	0	0	2	5	9

Source: own

implemented on a higher level in other European countries (Eurofresh Distribution, 2023).

Even though many of the respondents admitted that communication could help distribute information from the company to its public, thus building a positive image and a long-term transparent relationship, 10 out of the total of 16 respondents said that they are not focused on promoting the activities of the firm on social media. Although they agree that the integration of the company in Facebook/LinkedIn groups dedicated to local and specialized agriculture communities could have the potential to make the business more competitive, it is not necessarily a priority to improve in the future.

Among the technologies mentioned by the respondents in order to ensure a more sustainable rural development are vertical and horizontal integration of farm activities and the formation of rural clusters, promoting farms that focus on reduced environmental impact and sustainable energy generation, promoting modern farm management models to increase value added in agriculture, through crop rotation or diversification methodologies but also through IT or robotics applications, promoting innovation through collaboration between universities, public and private entities, confirming also the results obtained by Popescu et al. (2023). However, almost all respondents agreed that new, advanced technologies are not something they foresee happening in their business in the near future.

The fourth subject of discussion addressed in the semi-structured interview guide referred to the opinions of the managers regarding the future of the sector within the European and international context. In order to answer the fourth research objective, one open question was introduced in the interview guide (without a previous Likert scale): "Q4. What are your thoughts about the future of the agriculture sector within the European and international context?"

Fifteen out of the sixteen respondents mentioned that they believe Romania needs a long-term strategy that ensures the strategic autonomy of agriculture, putting farmers at its center. Other topics mentioned by more than 10 respondents were: ensuring a link between food production in all its aspects (quantity, quality, diversity, accessibility, health safety), good management of natural resources (soil fertility, water quality, biodiversity), and the level of farmers' incomes who are expected

to deliver the goals from above (which are not easy).

At the same time, 10 respondents emphasized the fact that Romania's strategic positioning on the Black Sea represents a key position for Romanian agriculture, because exports can be easily transported through Constanta Port and the necessity to position Constanta Port among the main European ports, alongside Antwerp, Hamburg or Rotterdam, was mentioned. In the conditions in which Constanta would develop more as a strategic and commercial hub, grain exports, would increase more rapidly, accelerating the development of Romanian commercial exchanges. These respondents referred to a positive point of Ukrainian grain transit to international markets through Romania, namely that the Port of Constanta has become the most important alternative export route for Ukraine after the Russian invasion in 2022. They noted that Ukrainian grain has generated record activity in the Port of Constanta and this should be further supported by upgrading the rail and road infrastructure in and around the Port of Constanta using European funds.

Eleven participants who took part in the interview, emphasized the importance of belonging to the European Union, to the common market that offers Romania the necessary openness to establish commercial relations with member countries for exports and imports. For example, Romania's main economic partners are Germany, Italy, Bulgaria and Hungary. These respondents mentioned the positive aspects of Romania being involved in various agriculture programs and schemes managed by the EU, one of the respondents stating that: "They should be reinforced in the following years bringing in more specialists and experts in EU funds contracting."

Five participants in the study mentioned that a possible future accession of Romania to the Organization for Economic Cooperation and Development (OECD) would place the country among the main economic actors at the global level, which could give the chance for new commercial partnerships to be established, developing Romania's commercial exchanges at an international level. In the same context, 2 participants developed their opinions on the topic regarding a future European Union – Mercosur Agreement, an agreement that would also open the doors of Romanian trade to new international markets, not yet penetrated

by Romanian agriculture stakeholders. This agreement would offer trade opportunities to Romania, mainly with Brazil, which is Romania's main economic partner in Latin America.

Conclusions

The recent events, most importantly the COVID-19 pandemic and the conflict in Ukraine have left their mark on inflation in food, agricultural products, energy and manufacturing products worldwide. The agricultural sector has also been impacted globally, both by the measures taken by governments against the pandemic, the war in Ukraine, the overall economic decline, and climate change. Even though Romania owns its strengths within the agricultural sector, having the 6th largest utilized agricultural area among EU countries and being among the world's top 10 exporters of wheat and maize, the country's agriculture encountered serious difficulties following these events. The pandemic, as well as other economic problems, highlighted the low level of digitization and implementation of advanced technologies in Romania, especially in agriculture. Romania's agriculture is insufficiently mechanized, affected by fragmentation of land ownership, lack of capital and irrigation systems, and lack of professional education of agricultural workers (Grădinaru et al., 2024).

Qualitative research was carried out on the basis of specific methodology in the form of in-depth interviews with respondents holding leadership positions within 16 Romanian agricultural companies. The aim of the research was to explore the state of the various facets of the Romanian agricultural sector such as the production process and costs, delivery, imports, exports, and sales, but also the advantages of new technologies and digitalization. Specific objectives were to: (i) identify the opinions of the managers regarding the consequences of the recent events on the future potential of agriculture in Romania; (ii) determine the perceptions of the managers on the impact of other issues with which agricultural companies had to deal in recent years; (iii) find out the plans and the prospects of the managers to potentially introduce or use new technologies and digitization within their own companies; and (iv) to uncover the opinions of the managers regarding the future of the sector within the European and international context.

The first subject of discussion addressed in the semi-structured interview guide concerned

managers' perceptions regarding the consequences of the recent events (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) on the future potential of agriculture in Romania. Regarding potential delays in the production process, more than 60% of the agricultural companies subjected to the study confirmed that the production process followed its natural course in spite of the recent challenges. Regarding the effects on the cost of the (agricultural) goods manufactured in their companies, more than half of the agricultural companies included in the research answered that the recent events (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) affected the factory costs. Concerning the repercussions on the delivery process, more than half of the agricultural companies participating in the study stated that the recent events (the COVID-19 pandemic, the energy crisis, the conflict in Ukraine) did not affect the delivery process. Regarding sales, half of the respondents said they were affected, ticking "agree," while 9 of them said their exports were also affected.

The second subject of discussion addressed in the semi-structured interview guide concerned the managers' perceptions regarding the impact of other issues with which agricultural companies had to deal with in recent years (climate change, draught, governmental measures and politics) on the future potential of agriculture in Romania. It is worth mentioning that 12 out of 16 respondents stated that farmers are among those most affected by climate change and environmental degradation because food production depends on soil fertility, water quality, weather conditions and the presence of pollinators.

The third subject of discussion addressed in the semi-structured interview guide dealt with the managers' perceptions about the plans and the prospects of the managers to potentially introduce or use new technologies and digitization within their own companies. Most of the people participating in the interview (7 respondents) were neutral regarding the introduction of new technologies in the production activity in agriculture (4 respondents ticked "agree" and only 2 "strongly agree," regarding the introduction of technology). Most of the participants (10 respondents) declared that they do not use promotion sources on social networks, such as Facebook, LinkedIn, TikTok. When asked about the future

digitization of the company's activity, many managers (9 respondents) ticked "strongly agree." Fourteen out of sixteen respondents specified that both in Romania and throughout the EU, agriculture is facing a double demographic challenge: on the one hand, the ageing of the agricultural population, and on the other, fewer and fewer young people living in rural areas. More than half of them (10 respondents) concurred that the Romanian agricultural sector is facing a low level of digitization and modernization compared to other EU member states and that investments in modernization and restructuring of factories and farms within the whole sector are needed to make Romanian agriculture more competitive.

The fourth subject of discussion addressed in the semi-structured interview guide referred to the opinions of the managers regarding the future of the sector within the European and international context. Fifteen out of the sixteen respondents mentioned that they believe Romania needs a long-term strategy that ensures the strategic autonomy of agriculture, putting farmers at its center. Other topics mentioned by more than 10 respondents were ensuring a link between food production in all its aspects (quantity, quality, diversity, accessibility, health safety), good management of natural resources (soil fertility, water quality, biodiversity), and the level of farmers' incomes who are expected to deliver the objectives from above (which are not easy).

At the same time, 11 farmers emphasized the fact that Romania's strategic positioning on the Black Sea represents a key position for Romanian agriculture, because of the export potential of Constanta Port.

The limitation of this paper is represented by the limited number of respondents constituting the sample; therefore, the future perspectives of this research consist in expanding the sample of people (to approximately 70 farmers from Romania) in order to carry out quantitative research and in order to get even more detailed picture of the effects of recent events, the COVID-19 pandemic and the conflict in Ukraine, on Romanian agriculture.

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