

DIGITIZING ROMANIAN AGRICULTURE, AN OPPORTUNITY FOR SUSTAINABLE DEVELOPMENT

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Abstract

Digital transformation represents one of the most current points of interest for the European Union. However, in agriculture, is digitalization a reality of the present or just a vision for the future? More and more processes are integrating into modern agriculture as offline and online activities increasingly converge in today's transition to digital agriculture. As the entire process is continuously developing, real opportunities emerge for all countries. A resilient agriculture that offers a secure future, based on minimal resources and sustainability, can only be built through a common concentration of efforts.

Digital technologies have the potential to revolutionize agriculture and help farmers work more precisely, efficiently, and sustainably. Perspectives created from concrete data can improve decision-making processes and performance in favor of the environment, making the job itself more attractive to the new generations of farmers. Digital technologies also provide increased transparency for end consumers throughout the distribution chain.

The digitalization of Romanian agriculture can represent a turning point towards development at its true capacity, even in the current small-scale context. This paper aims to outline the opportunities and limitations that may arise on the path towards the digitalization of Romanian agriculture.

Keywords: digitalization of agriculture, sustainable development, progress, digital skills.

1. Introduction

The general confusion regarding the multitude of terms related to digitalization is that they all serve the same purpose. However, in practice, these terms mean different things: digital transformation leads to the creation of a digital organization, while digitization refers to the conversion of analog formats. Digitalization, the subject of this study, strictly refers to the process of automating business operations. In the case of digitalizing agriculture, it involves transitioning from conventional to digital agriculture through a series of favorable events.

Information and Communication Technology (ICT) is widely used in all economic and social domains due to its characteristics that enhance resource efficiency, productivity, and security (Meghișan-Toma & Nicula, 2020). In agriculture, digitalization and digital transformation are tools that can significantly contribute to optimizing processes and lead to sustainable farm development. New technologies can help stimulate innovations in creating sustainable agri-food systems and improve food production while better managing natural resources. At the European Union (EU) level, national efforts need to be continuously supported as they are tailored to the specific needs of each nation, and subsequently integrated into broader innovative systems.

According to the "Agenda for My Europe" within the new policies of the European Commission for the period 2019-2024, Europe must lead the transition to a healthier planet and a new digital world. These ideals can only be achieved through collective efforts and continuous investments to improve the unique economic situation of each member state (von der Leyen, 2019).

All the priorities identified by the President of the European Commission in the new mandate represent the reasons why all states need to be more united and form a common framework. Among these priorities, this paper will highlight the importance of "A Europe Fit for the Digital Age."

Digital technologies, especially artificial intelligence, are transforming the world on an unprecedented scale, changing the ways we communicate, work, and even live, as well as the functioning of societies and economies. Data, the Internet of Things (IoT), and 5G communication networks are the perfect ingredients for innovation, even in agriculture. These new technology applications are meant to help design solutions for societal challenges, especially in the context of rural and sustainable development.

An essential aspect emphasized by the President of the European Commission is empowering people through education and skills, highlighting the need for investments in the future of the planet by increasing efforts dedicated to learning. Education and workforce skills are the strengths and opportunities of tomorrow's Europe, without which the digitalization of agriculture or any other economic sector would not be possible. To streamline the entire transformation process, both Romania and the European Union need to encourage access to high-quality education for all.

The Common Agricultural Policy (CAP), as the EU's mechanism to support farmers in achieving higher incomes and market competitiveness, is the perfect way to stimulate and intensify investments in farm restructuring, modernization, innovation, and digitalization, alongside existing essential measures to support the agri-food sector. The opportunities provided by digital solutions will determine and enhance farmers' position in the food distribution chain. Producer organizations can also benefit from the applicability of ICT and carry out activities at a more efficient pace (CE, 2017).

The Agency for Rural Investment Financing (AFIR) is the main government institution in Romania responsible for managing European funds for agricultural investment and rural development. Over the years, AFIR has optimized its operational flows and developed digital applications to increase the absorption rate of European funds and develop an efficient payment system. With over 4 million authorized payment applications only for the National Rural Development Program (PNDR) 2014-2020 and related transition measures, AFIR developed a predictive payment system using artificial intelligence (AI) powered by Microsoft Azure before the pandemic. In Romania, AFIR is the promoter of digitalization in agriculture, being the most digitalized government institution. AFIR's accomplishments and recognition by Microsoft highlight its role as the leading institution in Romania for implementing AI-driven IT systems and promoting the development of rural areas through AI. Some important aspects of AFIR's specific activities utilizing artificial intelligence include increasing the absorption rate of funds through the optimization of funding requests, procurement processes, and beneficiary payments. AFIR enables online access to PNDR funds exclusively and utilizes IT solutions for expense forecasts, benefiting both the beneficiaries and the institution.

All these components and technologies related to institutional digitalization for supporting and strengthening the socioeconomic development of rural Romania are integral to the implementation of Measure 20, "Technical Assistance," which is available to every EU Member State.

The Authority for the Digitalization of Romania (ADR) is a newly created institution with the objective of achieving the government's goals regarding the digital transformation of Romanian society. As stated in its mission, digitalizing Romania represents a migration toward a new paradigm with significant influences on technological, informational, and social development. ADR, along with AFIR, is a public institution that recognizes the need for cooperation between the private sector, associations, and local communities to build this complex process. ADR focuses on increasing process efficiency, standardization, participation in drafting coherent laws, and coordinating the digital transition of central and local administrative units.

In the summer of 2018, the European Commission submitted the PAC reform package for the post-2020 period, which is still being negotiated by the working groups of the Council of the

European Union. The package aims to define the new measures for the upcoming financing period. Digitalization and technological advancements in agriculture are among the measures proposed in this reform. In this regard, competent Romanian institutions have taken several measures to digitalize their own systems to serve the beneficiaries of European funds.

AFIR proposed various measures to fulfill the Commission's objective, such as reducing bureaucracy by eliminating unnecessary inter-institutional transport for obtaining required documentation. To this end, AFIR has established partnerships with different institutions to create a common database for verifying farmers' documents, fiscal records, land registers, criminal records, registration information, and correct beneficiary classification. Simplifying the document submission process for projects will be achieved through the development of online application platforms for funding requests, online procurement for contracted projects, and online submission of payment requests. Lastly, a single portal will be created for all rural development funds, providing useful information for both applicants and beneficiaries of European funds.

2.Literature analysis

Global agricultural systems continue to face significant challenges in providing sufficient and high-quality food for a growing population. The world is also rapidly changing with the emergence of a new matrix of technologies. Digital technologies offer unique opportunities to improve agricultural production and trade, especially for small-scale farmers (characteristic of Romania's agriculture, where 92.2% of agricultural holdings had less than 5 hectares in 2017, Eurostat, 2020), helping them make progress towards achieving the Sustainable Development Goals (SDGs).

In the agri-food sector, digital technologies are rapidly transforming the way people, businesses, and government organizations operate, already generating potential indirect cost reductions such as information dissemination, product transactions, and surveillance. Each country needs to shape specific strategies for agriculture to develop and implement new ways of utilizing digital technologies. These strategies should primarily promote the improvement of digital infrastructure and the development of digital applications and tools for agriculture and rural areas, aiming to reduce technological disparities between economies, sectors, or even within enterprises (FAO, 2020).

Innovation has been the protagonist of major revolutions in the agricultural sector. Every time a new technology emerges, the first adopters/users are the ones who benefit the most from them, which means that all players in agriculture need to stay one step ahead of the competition to enjoy a real advantage.

The turning point of the current revolution in the agricultural sector is called the Smart Agri-Food System and Agri-tech. These concepts offer advanced technological solutions based on applications such as augmented reality, mixed reality, and the Internet of Things, directly oriented towards increasing precision, profitability, and sustainability in agri-food activities.

The most important aspects of digitalization and technological development include higher quality at reduced costs, state-of-the-art traceability to increase the value of agricultural products, and more sustainable and responsible means of production. The combination of reduced costs and increased quality represents the link between innovation and progress. Market analysis has shown that the first necessary step to be implemented in agriculture, similar to other economic segments that have undergone a process of digitization/technological transformation, is renovating the current system to work with real and up-to-date data, in other words, large quantities of data, referred to as "big data." Acquiring and interpreting these types of data is the first step towards digitalization, a process in which all entrepreneurs must participate and accumulate know-how. Due to the intersection of local data with satellite data, it is possible to detect information about environmental conditions such as temperature, humidity, and sun exposure. If properly exploited and understood, this information can generate increasingly well-informed and faster managerial decisions.

Overall, the literature highlights the potential of digital technologies to revolutionize the agricultural sector, improve efficiency, and address the challenges of food security, sustainability, and profitability. Implementing digitalization strategies, leveraging big data, and adopting advanced technologies are crucial steps for the agricultural industry to thrive in the era of digital transformation. Product traceability is a crucial feature, especially in the context of globalization, as consumers pay special attention to the origin and production methods of the food products they purchase. Providing transparent traceability of products and easy access to the history of agricultural raw materials and all the methods involved in obtaining the final product, from cultivation, processing, storage, to shelf positioning, represents a direct guarantee of product quality for consumers. Thanks to new opportunities created by technology, consumers are just a click away from a wealth of digital information about the origin of products and production technologies. In this regard, by using the camera of any device, the end consumer can scan the barcode available on the packaging of food products to obtain information about the company and the product.

In this context, we mention as an example of good practice at the level of AFIR (Romanian Rural Investment Agency), the existence since 2018 of an application dedicated to certified Romanian agri-food products, called the Catalog of Certified Food Products (CPAC). The purpose of the application is to create a direct connection between producers and consumers. CPAC Web is connected to CPAC mobile so that all products that have received certification for quality schemes from the Ministry of Agriculture and Rural Development (MADR) can be automatically viewed in the CPAC mobile application as well. This platform includes over 1,200 agri-food products from over 400 local producers, as well as over 600 agro-tourism guesthouses.

Another aspect of the agri-tech concept is its applicability to sustainable development. Farms today embody more values and stability than ever before. Besides offering more efficient production methods, higher quality of agri-food products, and more information to consumers, smart agriculture also has the capacity to guarantee sustainable production methods that aim to save significant water resources, minimize environmental impact, and reduce production costs. Currently, there are numerous technological solutions that enable entrepreneurs to monitor and calculate values that influence human health, air and soil quality, closely track biodiversity conservation, water and energy consumption. All these digital solutions are accompanied by applications and platforms that will gradually lead to the agriculture of the future.

4.Results

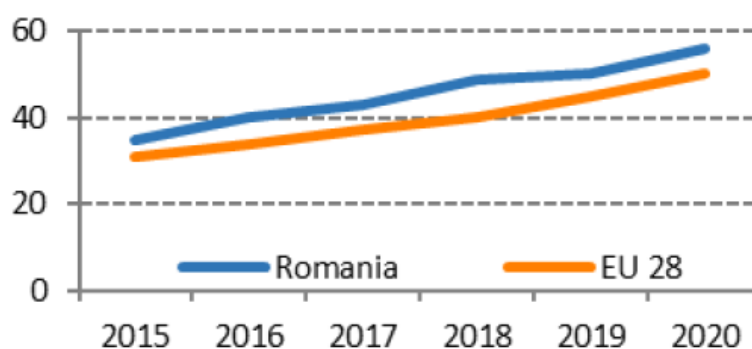


Figure 1. Internet Connectivity Rate, Romania vs. European Union-28
Source: (CE, 2020)

Romania ranks in 2020, the eleventh country in the European Union in terms of connectivity (rate shown in Figure 1). Following the economic-digital and social indexing (DESI) for 2020, Romania obtained a score of 56.2 out of 60 for 2020, ranking 11th in the Union for connectivity, registering a variation compared to 2019 of 12 percent for 2020, a 10 percent increase over 2019

growth compared to 2018. This growing indicator highlights the strong infrastructure that modern agriculture must use.

In 2015, Romania adopted a plan for the bandwidth used for the Internet. In order to reduce the disparities between the rural and urban environments from a digital point of view, Romania accesses in the period 2014-2020 through the Competitiveness Operational Program (POC) 100 million euros through the European Regional Development Fund alongside the 25 million euros through the National Rural Development Program (PNDR) through the European Fund for Agriculture and Rural Development under the LEADER program which allocates around 2 million euros specifically for digital infrastructure measures. The RoNet program aimed at the transformation of downgraded networks, which received funding of 45 million euros through the European Regional Development Fund, through which 695 localities benefited from support, is also important to remember.

Table 1. Digital skills of the population

UM: %	România			UE	Δ 2019 Ro, UE (%)
	2016	2017	2019	2019	
People who do not have digital skills	0	0	0	1	N/A
People who have low digital skills	32	35	43	28	35
People who have average digital skills	19	19	21	25	-19
People who have above average digital skills	9	10	10	31	-210

Sursa: Eurostat

Table 1a. Digital Skills of the Population Extrapolated by Residential Areas and Age Groups

Young people aged between 15-24 years	Romania			Average year-over-year variation
Urban (thousands of people)	2016	2017	2019	
People who do not have digital skills	-	-	-	-
People who have low digital skills	1,178	1,142	1,112	-4%
People who have average digital skills	224	217	234	3%
People who have above average digital skills	106	114	111	3%
Rural (thousands of people)	2016	2017	2019	
People who do not have digital skills	-	-	-	-
People who have low digital skills	390	423	511	20%
People who have average digital skills	231	230	250	5%
People who have above average digital skills	110	121	119	6%
People aged between 25-59 years	Romania			
Rural (thousands of people)	2016	2017	2019	
People who do not have digital skills	-	-	-	-
People who have low digital skills	1,500	1,648	2,040	23%
People who have average digital skills	891	895	996	8%
People who have above average digital skills	422	471	474	8%

Source: Eurostat and National Institute of Statistics (Institutul Național de Statistică)

Table 2. Digital Skills of Individuals Working in Agriculture, Forestry, and Fishing

UM: %	Romania			UE	Δ 2019 Ro, UE
	2016	2017	2019	2019	
People who do not have digital skills	-	-	-	2	N/A
People who have low digital skills	28	39	49	43	12
People who have average digital skills	6	9	11	19	-73
People who have above average digital skills	2	2	2	11	-450

Sursa: Eurostat

Table 2a. Digital skills extrapolated for people working in agriculture, forestry, and fishing.

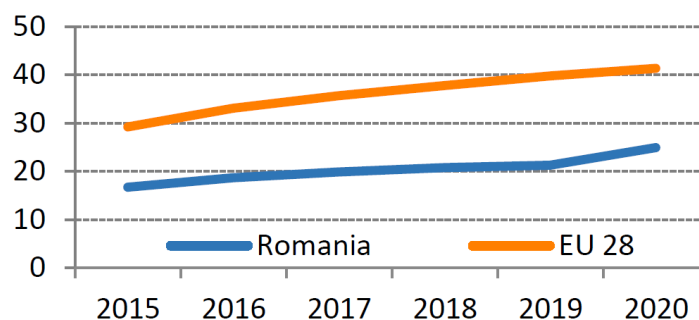
UM: thousands of people	Romania			Average year-over-year variation
	2016	2017	2019	
People who do not have digital skills	-	-	-	-
People who have low digital skills	484	679	856	48%
People who have average digital skills	104	157	192	53%
People who have above average digital skills	35	35	35	1%

Source: Eurostat and National Institute of Statistics (Institutul Național de Statistică)

As can be observed in tables 1 and 2, in 2019, individuals with digital skills compared to the previous analyzed period of 2017. Compared to the data reported at the European Union level, Romania recorded increases only in the category of individuals with low digital skills, which is the most significant category, even for those active in agriculture. The category with above-average digital skills in the local labor market is 4.5 times lower than the EU average. The most concerning aspect is that there was no progress recorded in 2019 compared to 2016 or 2017, indicating that farmers did not seek to acquire digital skills. An important aspect to monitor, without which agriculture cannot undergo complete digitalization, is the concrete basis of human resources' digital skills in agriculture. In table 1a, the actual number of people facilitating technological training can be observed through a statistical artifice. In terms of the main age categories regarding the acquisition of new digital skills or improvement of existing ones, the selected categories represent those most likely to be interested in adapting to the newly emerging market conditions. In urban areas, there are over 1 million inhabitants aged 15 and above who certainly have advanced digital capabilities and do not encounter difficulties in using new technologies. Among them, individuals with entrepreneurial appetite need to be identified, and competent government agencies and the profitability of investments in precision agriculture should stimulate their involvement in this modern agricultural sector. In addition to these potential individuals, there are over 500,000 people aged between 15 and 24 in rural areas in 2019, which could manifest an increased interest in the agricultural sector, eliminating the need for a shift from urban to rural areas. The target audience for existing and immediately forthcoming digitalization programs exceeds 3 million inhabitants, falling within the age category of 25 to 59, who, despite residing in rural areas, still possess at least low knowledge in the digital field. This is a representative segment of the population that could embrace the direct advantages brought by the application of digital technologies in their respective areas through the surplus of added value indirectly provided by digital farms, the need for qualified workforce in the digital field, increased productivity, and expanded commercial horizons (direct trade links with the final actors involved in the supply chain through the use of software interfaces for the direct delivery of agri-food products). The only categories of individuals that have shown a significant positive variation happen to be the most promising ones, namely the youth (15-24 years) in rural areas who possess low knowledge, and within the same category, individuals between 25 and 59 years old, also from rural areas. In table 2a, the actual number of individuals working in agriculture, forestry, and fishing who possess digital skills can be observed, totaling over 1 million

people in 2019. These individuals are included in the previously presented numbers from table 1a and they represent the exact population that can benefit from any digital progress in agriculture, especially since they already possess at least minimal knowledge. The encouraging aspect is reflected in the significant increase in individuals with intermediate skills, users who would certainly be delighted with adequate ICT training that allows performance improvement. Returning to the European Commission's DESI study, Romania ranks last in digital technology integration, with a score of 24.9 out of 50 in 2020 compared to the EU average of 41.4.

Figure 2. Value of Digital Technology Integration, Romania vs European Union-28.



Source: (CE, 2020)

Table 3. Indicators calculated from DESI for reporting digital technology integration.

UM: %	Romania			UE	Δ 2020 Ro, UE (%)
	DESI 2018	DESI 2019	DESI 2020	DESI 2020	
Electronic information sharing (% of companies)	22	22	23	34	-48
Use of social media (% of companies)	9	9	8	25	-213
Big data (% of companies)	11	11	11	12	-9
Cloud (% companies)	6	7	7	18	-157
SMEs selling online (% SMEs)	8	8	11	18	-64
Online commerce revenue (% SME revenue)	5	5	5	11	-120
Cross-border online sales (% SME)	2	2	6	8	-33

Source: (CE, 2020)

As seen in Figure 2 and Table 3, Romania has not experienced any exponential growth, and the values of each indicator have remained nearly the same from year to year, indicating that insufficient measures have been taken to accelerate technology integration. The variations between the DESI 2020 indicators and those from 2019 compared to the EU average have only shown negative values. The largest discrepancy is observed in the case of companies using social media networks to promote their activities, with numbers 2.13 times lower in Romania compared to the EU average. Similarly, technologies such as cloud data storage and online commerce revenues show discrepancies of over 1.2 times.

Table 4. Measure 20 "Technical Assistance" PNDR 2014-2020

Year	Year Contracted projects	Year Contracted projects
2016	20	2.1
2017	41	5.1
2018	86	9.7
2019	135	16.2
2020	157	17.3
Public allocation PNDR 2014-2020		209

Source: AFIR

According to the figures reported by AFIR, in the year 2020, 157 projects were contracted for Measure 20 "Technical Assistance" (Table 4). Regarding the Technical Assistance component within the PNDR 2014-2020, in accordance with the current European legislation, each Member State is obliged to allocate a minimum of 4% of its total financial allocation. The purpose of this component for our country is to provide administrative, logistical, advertising, promotional, and human resources management support to the institutional organizations involved in the implementation of the PNDR, namely MADR, AFIR, and the Agency for Payments and Investments in Agriculture (APIA). Each institution involved is allocated a proportion of this percentage, based on the needs in terms of eligibility and compliance with the measure's specifications.

The public allocation through PNDR 2014-2020, amounting to 209 million euros, was divided among the three participating institutions, AFIR (30%), MADR (40%), and APIA (30%), for both the PNDR implementation period (2014-2020) and the transition period (2021-2023). A significant portion of the allocation received by AFIR was intended for funding contracts related to the digitalization component. The agency has utilized this component, and currently, all workflows, from submitting funding applications to signing documents, are carried out exclusively online through established digital systems.

Romania does not have a national strategy for digital transformation for businesses, and this key aspect is also missing in the agricultural sector. Romania encourages the startup ecosystem through the Start-up Nation program, providing assistance to enterprises that innovate and integrate digital technologies. At this moment, Romania needs a national strategy that focuses its efforts on digital transformation across all businesses, with targeted measures for all sectors of the economy, especially the agri-food sector. Such a strategy should also increase awareness of the direct benefits brought by digital technologies.

The most secure method to achieve results for agri-food businesses is through improving solvency as a direct result of an efficient mechanism that utilizes domestic investment opportunities dedicated to introducing foreign investments and techno-digital solutions into the agriculture economy (Jurayevich & Bulturbayevich, 2020).

Achieving SDG 2 "Zero Hunger" of the 2030 Sustainable Development Agenda will require more productive, efficient, sustainable, inclusive, transparent, and resilient agricultural systems (FAO, 2017b). These aspects necessitate an urgent transformation of the current agri-food systems.

The next period of growth is predicted to come from rural communities. According to international studies, 70% of the poorest 20% of people in developing countries already have access to mobile phones, and over 40% of the world's population has access to the internet. Numerous initiatives worldwide are already underway to connect rural areas, thereby offering multiple opportunities for agricultural technological development (The World Bank, 2016).

So far, essential aspects for the digitalization of the Romanian agricultural sector have been highlighted, such as online trading, internet access, the use of digital technologies among rural populations and farmers, digital skills, and digital entrepreneurship alongside a culture of innovation.

Statistical data describing individuals with digital competencies, as presented in this paper, indicate that even in the digital domain, access to technology directly affects the widespread use of digital innovations. However, the most important requirement to unlock digitization and access to state-of-the-art technologies is internet access. Education and income are also important determinants in the equation of "when and if people will use the internet." Individuals with higher educational qualifications tend to utilize modern services such as online commerce and internet/mobile banking, and they even access public institutions through technology. Individuals with lower educational qualifications predominantly use internet services for communication and entertainment purposes (Trendov, Varas, & Zeng, 2019).

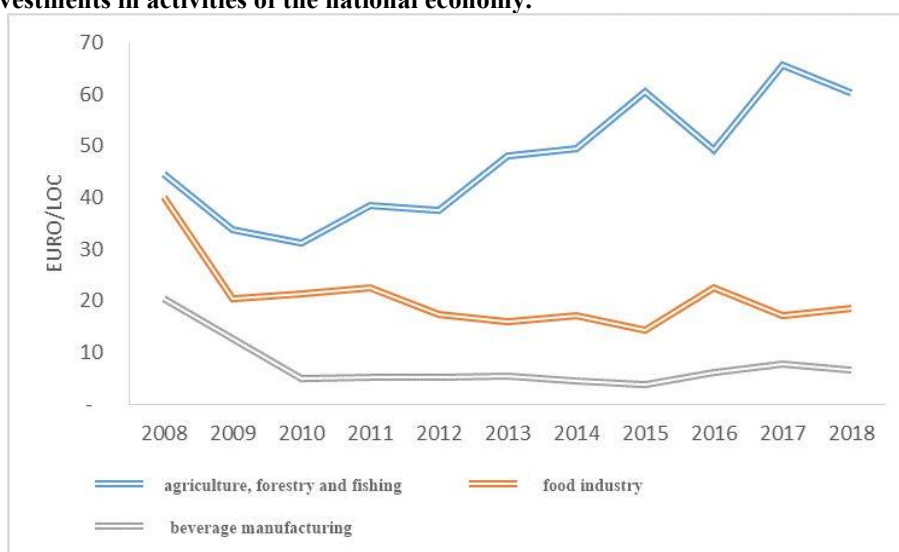
The low percentage of ownership of smartphone or other devices, especially in areas where the cost of internet connectivity is already higher than in urban areas, even if the connections are limited, represents additional threats to the use of agricultural applications. This, coupled with the inability to fully utilize social networks for promotion or communication among farmers, diminishes the flow of information and potential support. Increased internet accessibility could lead to better-informed decisions by farmers, contribute to increased productivity per hectare, and reduce negative impacts on the environment.

The diversity of available technologies, the lack of standardization and compatibility between them for data exchange, creates an additional concern for farmers. However, the transferability of digital information in a unified and user-friendly form represents a real opportunity and can also be a barrier for the digital farmer.

Digitalization instantly generates a high demand for digital skills and competent human resources in the use of digital equipment, understanding the entire process, ever-changing programs, and cutting-edge applications. These aspects involve not only digital fluency and working with databases but also communication skills. In the case of Romanians, where such skills are lacking, education needs to be improved urgently. The ICT sector is rapidly evolving, and learning rates need to be accelerated urgently (UNDP, 2015).

Education is the most crucial factor in accelerating digital transformation. The Romanian government needs to adopt a detailed system to stimulate research, development, and innovation in education, focusing on investment in research and development and the amplification of domestic technologies. It is necessary to work with a coalition of partners to redesign education, highlighting the use of electronic tools, learning through trial and error, rewarding and appreciating experimentation, critical thinking, and digital software skills.

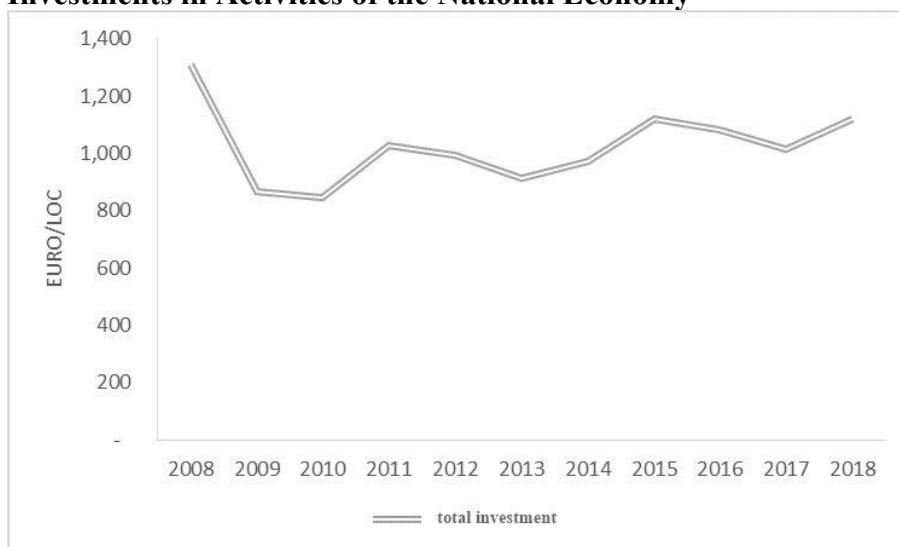
Figure 3. Net investments in activities of the national economy.



Source: The National Institute of Statistics. (Institutul Național de Statistică)

For a better understanding of economic activities that depend on the proper functioning of the agri-food sector, it can be observed in Fig. 3 that the evolution of investments in agriculture is more prominent than in other similar sectors. Compared to investments in the food industry and beverage manufacturing, investments in agriculture were 2 times and 8 times higher in 2018, respectively. The average variation in investments in agriculture during the period 2010-2018 was 8%, demonstrating the investment importance of the sector and providing an opportunity to attract potential agricultural investments in the field of digitization and technological advancements.

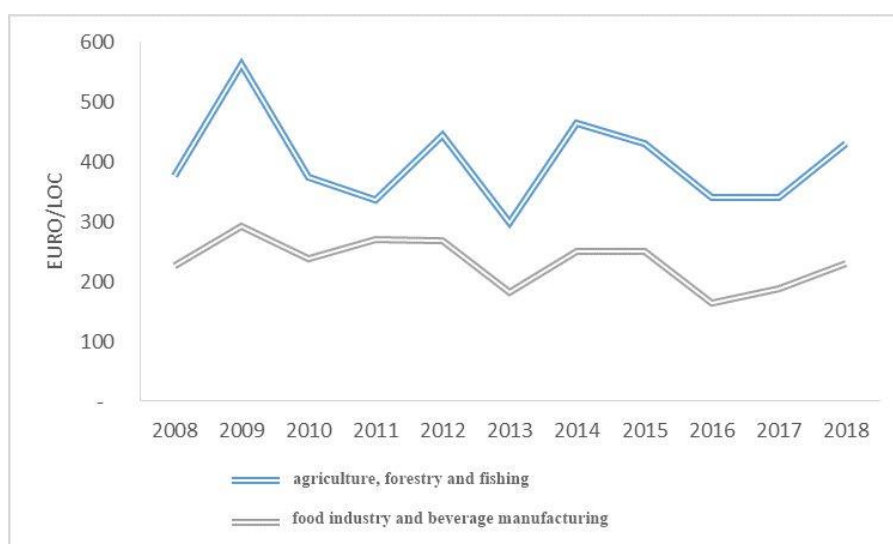
Figure 4. Net Investments in Activities of the National Economy



Source: National Institute of Statistics

In Fig. 4, it can be observed that total investments have not yet reached the level of 2008, unlike agricultural investments (Fig. 3), which show an upward trend in recent years. The highest percentage of total investments held by agriculture was recorded in 2017 at 6.5%, while the lowest value was recorded in 2008 at 3.4% of the total investments dedicated to agriculture.

Figure 5. Value Added



Source: National Institute of Statistics

Value added in agriculture, forestry, and fishing, along with that in the food industry and beverage manufacturing, are indicators directly influenced by the quality of agricultural production

and, especially, rural socio-economic conditions. On average, throughout the analyzed period, as visible in Figure 5, the variation between value added in agriculture and that in the food industry is 73%. It would not be difficult to imagine the values that could be achieved for agriculture and even for the food industry if complete digitization were established at the level of each agricultural production unit.

Even though technologization will depend on access to education, with the increasing level of digitization, the possibilities for improving awareness and education about new applications in the field will also increase.

5. Conclusions

Conventional agriculture requires a real transformation in order to reach its maximum potential, providing rural communities with continuous development and improved socio-economic conditions.

Traditional agriculture should not be interrupted but rather improved. Information technology applications are meant to optimize processes and enable sustainable resource management. Therefore, encouraging the transition is necessary, and this is gradually being facilitated through various available development mechanisms.

The study has shown that education and its quality improvement are the next steps towards ensuring sustainable rural development and creating an optimal foundation for implementing digitalization processes in agriculture.

Innovation represents a competitive advantage even in agriculture, and all market actors need to stay updated with the latest technologies.

While initially focusing efforts on digitalization may involve high research and development expenses, overall, a digital society and enterprise will lead to rapid production growth of higher quality at reduced costs, resulting in better traceability and added value.

The internet connectivity rate in Romania is the only digital rate that exceeds the EU average and provides a foundation for digital transformation. Internet connectivity is crucial for modern societies, and current internet infrastructure development plans will generate increased opportunities for using these technologies, even in rural areas, not only for social applications but also for agricultural activities.

In Romania, there are many individuals in rural areas who possess digital skills, especially among the age groups between 15 and 59. They are direct beneficiaries of any development measures aimed at digitalization. These individuals, with minimum knowledge, could use technology to improve both working conditions and net results.

The motivation for choosing to delve into this topic is reflected in the conclusions derived from Table 3 of the previous chapter, where it is observed that not a single indicator analyzed by the European Commission in the economic-digital and social indexing of EU countries has exceeded the EU-28 average for Romania in 2020. The most significant and urgent improvements that agricultural companies should make, based on these observations, are increasing the use of social media platforms for economic purposes and exclusively implementing electronic sharing of tax information, without referring to advanced technologies such as cloud data storage or online sales. These may seem like science fiction concepts, but they present opportunities for the predominantly rudimentary Romanian agriculture.

The lack of a national digital transformation strategy is as relevant as the absence of the desire to digitalize a company, especially in the agricultural sector when it comes to the next steps in the harmonious digital development of Romanian agriculture.

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