ARTIFICIAL INTELLIGENCE IN AGRICULTURE, THE BASIS OF SUSTAINABLE MANAGEMENT

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Abstract:*This paper is an analysis of the potential that AI must revolutionize the way farmers operate and manage their farms. Artificial intelligence (AI) has become a key factor in transforming modern industries, and Romanian agriculture is no exception. In Romania, a country where agriculture accounts for 4.5% of the gross domestic product (GDP), agriculture is transforming dramatically thanks to advanced technologies. In the context of climate change, population growth, resource scarcity and declining soil fertility, innovations brought by artificial intelligence in agriculture are essential to solving many of the challenges. AI has a broad spectrum, from optimizing production processes and reducing waste, to crops monitoring and management and improving yields. However, the adoption of these technologies depends on investments in infrastructure, farmer education and support from authorities. If implemented correctly, AI can ensure a sustainable and prosperous future for Romanian agriculture. This research shows that AI will continue to play an increasingly significant role in agriculture in the future, contributing to the development of sustainable solutions that will support farmers in the current challenges, but also can help farmers to obtain and market agricultural products, by adding value in a competitive market. More than that, the wider integration of AI will enable more efficient land and resource management, reducing negative environmental impacts and ensuring a more sustainable global food system. However, research shows that the real risk farmers face is losing control over their own data and knowledge, thus becoming dependent on AI, for which they have to pay dearly.*

• Introduction

Agriculture makes extensive use of artificial intelligence, which is defined as systems that can carry out tasks that normally need human intelligence. As a result, incorporating AI into agricultural operations is a revolutionary step toward utilizing the newest technology that may offer farmers priceless assistance in addition to cutting-edge hybrids and creative crop protection solutions for Romania's cutting-edge agriculture. Decision-making procedures that are faster, more accurate, more analytical, and multitasking than human capacities are made possible by technology. AI and agriculture have a basic relationship that offers revolutionary ways to solve problems, boost productivity, and advance precision farming

• Material and method

As part of this research, data provided by the European Commission and the Ministry of Agriculture of Romania were analyzed and processed.

• Results and discussions

AI is capable of forecasting prices, analyzing market demand, performing predictive analytics, and figuring out the best times to plant and harvest.

Another advantage of applying AI to agriculture is cost savings. Precision farming, when paired with artificial intelligence, can help farmers produce more crops with less.

The percentage of Romanian agricultural businesses with more than ten workers that have implemented at least one AI technology is only 1.5%, which is much lower than the EU average. Many agricultural businesses believe AI is quite costly, with license and support fees accounting for a portion of the total cost. This idea deters investment, particularly from farmers, who may not always have the funds to support such projects. Adoption efforts are further complicated by the dearth of skilled experts with artificial intelligence skills, as businesses struggle to hire or train staff members with the requisite knowledge.

Conclusions

The quality of crop productivity, animal health, and—most importantly—farmers' quality of life will all be enhanced by artificial intelligence. Nevertheless, the industry faces numerous difficulties as a result of the lack of funding. To increase their capacity to produce things more effectively, Romanian farmers need training in artificial intelligence techniques in addition to funding for the acquisition of machinery and other equipment.