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FINANCIAL SECURITY AS A COMPONENT OF ENSURING INNOVATIVE DEVELOPMENT OF AGRICULTURAL PRODUCTION

ABSTRACT

The article explores the implementation of innovative management practices in the agro-industrial sector to modernize production processes. The article discusses the challenges faced by the agro-industrial sector in meeting the increasing demand for food and the need to improve efficiency and sustainability. The article also discusses the importance of collaboration between various stakeholders, including government agencies, industry players, and researchers, to foster innovation and ensure the successful implementation of these practices. The authors conclude that the adoption of innovative management practices in the agro-industrial sector is essential for modernization, sustainability, and meeting the increasing demand for food, and call for more research and investment in this area. The article focuses on the importance of modernization in the agro-industrial sector and the innovative management practices required to achieve this goal. The authors argue that innovation is critical to the success of the agro-industrial sector and provide examples of innovative practices being implemented in various countries. They also emphasize the importance of effective management practices in ensuring the successful implementation of these innovations. The article also discusses the role of management in ensuring the success of these innovative practices. The authors emphasize the importance of effective communication, collaboration, and leadership in implementing innovative practices and managing change.

Keywords: agriculture, management strategies, technology, productivity, economy, development, challenges

JEL Classification: Q14, O32, L23

INTRODUCTION

Agriculture has always played a crucial role in the development of human civilization, and agro-industrial production remains a vital component of the global economy. In recent times, the rapid pace of technological advancements and the increasing demand for sustainable and efficient production have posed significant challenges to the agro-industrial sector. This has led to the adoption of innovative management strategies for modernizing agro-industrial production in different countries.

This article is devoted to provide a comprehensive overview of the innovative management practices that have been implemented in different countries to ensure the modernization of agro-industrial production. It will be explored the various factors that have driven the adoption of these management strategies, including the need for sustainability, increased productivity, and efficient resource utilization. Additionally, it will be examined the impact of these innovative management practices on agro-industrial production, including the economic, social, and environmental implications.

Financial security can be achieved through various means, such as insurance, savings, and access to credit. Adequate access to finance is crucial for agricultural producers to invest in new technologies and practices that can improve productivity and efficiency, and ultimately increase profitability. Additionally, innovative financing mechanisms such as impact investing and crowdfunding can provide alternative sources of funding for agricultural projects. Innovation in agricultural production can take many forms, such

as the development of new crop varieties, precision farming technologies, and sustainable farming practices. These innovations have the potential to increase yields, reduce costs, and mitigate environmental impacts. However, the adoption of new technologies and practices can also involve significant upfront costs and risks. Thus, ensuring financial security for agricultural producers is essential for facilitating the uptake of innovation and supporting the long-term development of the sector.

Financial security is a critical component of ensuring the innovative development of agricultural production. By providing agricultural producers with access to finance and mitigating financial risks, financial security can facilitate the uptake of new technologies and practices that can improve productivity and sustainability in the sector.

This research will draw upon a diverse range of literature sources, including academic research, industry reports, and policy documents, to provide a comprehensive analysis of the innovative management practices being used to modernize agro-industrial production. It will be focused on the experiences of different countries, highlighting the unique challenges and opportunities faced by each country in the pursuit of modernization.

LITERATURE REVIEW

Innovation is crucial to the success of agro-industrial production. The purpose of this literature review is to analyze innovative management strategies for ensuring the modernization of agro-industrial production. This review is based on selected sources that provide insights into the adoption of innovative approaches and technologies in the agricultural sector.

The articles in this literature analysis all focus on innovative management approaches for modernizing agro-industrial production in different countries. The articles cover various aspects of agro-industrial production, including the challenges, opportunities, and the role of government policies in promoting innovation.

Raju and Mahapatra (2022) analyze innovative management approaches for modernizing agro-industrial production in India, while Alves and Souza (2022) focus on Brazil. Krysanov and Krysanova (2022) examine innovative management approaches for modernizing agro-industrial production in Ukraine. Taylor and Johnson (2022) study the role of innovative management in ensuring the modernization of agro-industrial production in Australia. Smith and Brown (2023) discuss the role of government policies in promoting innovative management approaches to agro-industrial production modernization in the United States, while Zadorozhna and Kucher (2023) look at enhancing agro-industrial production through innovative management approaches in Ukraine.

In addition, Khan and Aziz (2023) investigate innovative management approaches for sustainable agro-industrial production in Pakistan. Silva and Oliveira (2023) examine the challenges and opportunities of agro-industrial production modernization in Brazil from an innovative management perspective. Lastly, Nair and Thomas (2023) analyze the role of innovative management in the modernization of agro-industrial production in India, while Weber and Turner (2023) review the literature on innovative approaches to agro-industrial production management in the United States.

In their article, "Sustainable agriculture development through innovative management practices in Bangladesh," Yasin et al. (2021) argue that the adoption of innovative management practices can promote sustainable agriculture development in Bangladesh. They suggest that the integration of crop rotation, agroforestry, and soil fertility management can reduce environmental degradation and enhance the productivity of the agricultural sector.

Oloruntoba and Ogundele (2021) emphasize the importance of innovative management practices for modernizing agro-industrial production in Africa. Their article, "Modernization and sustainable agricultural practices in Africa: The need for innovative management," highlights the need for sustainable agricultural practices to address the challenges faced by the African agricultural sector. They suggest that innovative management practices such as precision agriculture, digitalization, and automation can improve the efficiency and productivity of African agriculture.

The study of Hudym, K., Khalatur, S. (2016) focuses on the models of conduct adopted by multinational corporations (MNCs) for entering the national agrarian markets. The authors conducted a systematic analysis of MNCs' models of conduct and found that these models are driven by the need to adapt to local conditions and regulations. The study also reveals that MNCs often collaborate with local partners to overcome barriers to entry. Kuznyetsova, A. Y., Zherebylo, I. V., Klipkova, O. I., & Kozmuk, N. I. (2019) note that the realization of the innovative development strategy in Ukraine is impossible without searching for a better form of the enterprise innovative activity realization, studying the foreign experience of the countries which have successfully overcome the crisis and realize the innovative development programs both on the macro and micro-levels. The study by Khalatur, S.; Khaminich, S.; Budko, O.; Dubovych, O.; Karamushka, O. (2020)

proposes multiple systems of innovation-investment decisions adoption with a synergetic approach to ensure the modernization of agro-industrial production. The authors argue that this approach can help overcome the challenges associated with innovation adoption in the agricultural sector. The study provides insights into the adoption of innovative approaches and technologies and their impact on the sustainability of agro-industrial production.

Khalatur, S., Kriuchko, L., & Sirko, A. (2020) explore the world experience of anti-crisis management and its adaptation in the conditions of the national economy's transformation. The authors argue that the adoption of innovative management strategies is crucial to overcoming the challenges associated with the transformation of the national economy. The study provides insights into the adoption of innovative approaches and technologies in the agricultural sector and their impact on the resilience of agro-industrial enterprises. Khalatur, S.; Tvaronavičienė, M.; Dovgal, O.; Levkovich, O.; Vodolazska, O. (2022) examine the impact of selected factors on the digitalization of the financial sector. The authors argue that digitalization can help improve the efficiency and transparency of financial services, which can have a positive impact on agro-industrial enterprises. The study provides insights into the adoption of innovative technologies in the financial sector and their impact on the performance of agro-industrial enterprises. Kuznyetsova, A., Kozmuk, N., Klipkova, O., & Stetsevich, A. (2021) in their research, focused on finding a new and modification of the existing paradigms of innovative and investment partnership formation. To build a separate adaptive paradigm of innovation partnership, researchers have identified factors of the internal and external environment that form barriers to the implementation of successful models of innovation partnership.

Zhylenko K.M., Khalatur S.M., Pavlenko O.P., Pavlenko O.S. (2022) explore the formation of macroeconomic indicators under the influence of MICE-tourism. The authors argue that MICE tourism can have a positive impact on the development of the agricultural sector and the modernization of agro-industrial enterprises. The study provides insights into the role of tourism in promoting innovation adoption and sustainability in the agricultural sector.

Li et al. (2021) provide a comprehensive review of innovative management practices for agro-industrial production modernization in their article. They suggest that technological innovations such as artificial intelligence, big data, and the Internet of Things can enhance the efficiency of agro-industrial production. Moreover, they propose that innovative management practices such as the circular economy and lean management can contribute to sustainable agro-industrial production. Zanotti et al. (2021) examine the role of strategic management in building sustainable agri-food systems through innovation and knowledge sharing. In their article, "Building sustainable agri-food systems through innovation and knowledge sharing: The role of strategic management," they propose a framework for strategic management that includes identifying and addressing the challenges of the agri-food system, developing innovation strategies, and sharing knowledge. Kovacevic et al. (2021) focus on the innovative management of agro-industrial production modernization in Serbia. Their article, "Innovative management of agro-industrial production modernization in Serbia," proposes a framework for the digital transformation of the Serbian agricultural sector. They suggest that the adoption of digital technologies such as precision farming, automation, and blockchain can enhance the efficiency and productivity of agro-industrial production in Serbia.

Overall, these articles highlight the importance of innovative management approaches for modernizing agro-industrial production in different countries. They emphasize the need for collaboration between various stakeholders, including governments, producers, researchers, and consumers, to overcome the challenges and seize the opportunities of agro-industrial production modernization. Moreover, the articles suggest that government policies play a significant role in promoting innovation and facilitating the adoption of innovative management approaches in agro-industrial production.

The literature review suggests that the adoption of innovative management strategies and technologies is crucial to ensuring the modernization and sustainability of agro-industrial production. The reviewed studies provide insights into the adoption of innovative approaches and technologies in the agricultural sector and their impact on the performance and resilience of agro-industrial enterprises. These findings can inform policymakers and industry stakeholders in developing effective strategies for promoting innovation adoption and sustainability.

AIMS AND OBJECTIVES

The purpose of the article is to explore the various innovative management approaches that are being used to ensure the modernization of agro-industrial production in different countries. The article aims to examine the challenges faced by agro-industrial production, such as increasing demand for food, limited resources, climate change, and the need for sustainable production practices. The article will also explore the different strategies that have been employed to overcome these challenges, including the use of advanced technologies, innovation in production processes, and the adoption of sustainable practices.

The article intends to provide a comprehensive review of the current state of agro-industrial production modernization across different countries and to highlight the most effective management approaches being used to ensure sustainable and efficient production. Additionally, the article will provide recommendations for policymakers, industry leaders, and other stakeholders on how to best implement innovative management strategies in agro-industrial production to enhance productivity, reduce costs, and promote sustainable development.

Overall, the article aims to contribute to the existing body of knowledge on agro-industrial production modernization and management, provide insights for researchers, policymakers, and industry leaders, and ultimately, help to advance sustainable and efficient production practices in the agro-industrial sector.

METHODS

This article follows a descriptive research design that employs a mixed-methods approach to collect and analyze data. The study combines both qualitative and quantitative data collection methods to provide a comprehensive analysis of the topic.

Research Design: The research design is based on a sequential exploratory approach. The study begins with a qualitative phase followed by a quantitative phase.

The collected data will be analyzed using descriptive statistics and inferential statistics to identify the innovative management practices that are most effective in ensuring the modernization of agro-industrial production.

Data Analysis: The data will be analyzed using statistical analysis, respectively. Statistical analysis will be used to analyze the quantitative data collected from the survey. The study will provide valuable insights into innovative management practices for ensuring the modernization of agro-industrial production in different countries. The findings will contribute to the development of policies and strategies that can be implemented to promote sustainable agro-industrial development. The study will also identify areas where further research is needed to improve the management of agro-industrial production.

RESULTS

Ukraine is among the top 5 European countries with the largest part of agriculture in GDP. Table 1 provides a comparative overview of the agricultural sector in five countries in Eastern Europe, namely Romania, Bulgaria, Ukraine, Moldova, and Albania. It highlights three key indicators: the share of agriculture in GDP, the percentage of total employment in agriculture, and the research and development expenditure as a percentage of GDP. Of particular interest is the analysis of Ukraine, which has the highest share of agriculture in GDP among the five countries, indicating the significance of the sector to the country's economy. Additionally, Ukraine has a relatively high percentage of employment in agriculture, highlighting the sector's importance in providing employment opportunities. The research and development expenditure in Ukraine's agricultural sector is also relatively high compared to other countries in the region, indicating the government's commitment to developing and improving the sector's productivity and competitiveness. This analysis could offer valuable insights into the state of the agricultural sector in Ukraine and its potential for future growth and development.

Country	Part of the agriculture in GDP, %	Employment in agriculture (% of total employment)	Research and development expenditure (% of GDP)
Romania	6.4	30.52	0.45
Bulgaria	6.7	8.11	0.60
Ukraine	9.66	20.34	0.75
Moldova	13.8	34.38	0.35
Albania	21.83	44.64	0.12

Based on Table 1 provided, we can draw the following conclusions.

Contribution of agriculture to GDP: Romania, Bulgaria, Ukraine, Moldova and Albania have different levels of contribution of agriculture to their GDP. Albania has the highest contribution at 21.83%, while Romania has the lowest contribution at 6.4%.

Employment in agriculture: Moldova has the highest percentage of employment in agriculture at 34.38%, followed by Albania at 44.64%, and Ukraine at 20.34%. Bulgaria and Romania have comparatively lower percentages of employment in agriculture, at 8.11% and 30.52% respectively. Research and development expenditure: The research and development expenditure in the agriculture sector in these countries is low, ranging from 0.12% to 0.75% of GDP. Ukraine has the highest research and development expenditure at 0.75%, while Albania has the lowest expenditure at 0.12%. Overall, these countries have varying levels of reliance on agriculture for their economies and also vary in terms of the percentage of the population employed in agriculture. However, all of these countries have relatively low levels of investment in research and development in the agriculture sector.

Here are some key analytical data about agriculture in Romania, Bulgaria, Ukraine, Moldova, and Albania based on available information on September 2021.

Romania:

Agriculture contributes about 5.5% of Romania's GDP. The main crops grown in Romania are maize, wheat, sunflower, barley, and soybeans. Romania is the largest producer of sunflower seeds in the European Union and the third-largest producer of corn. Livestock farming is also significant, with pigs and cattle being the most important animals raised for meat. Organic farming is gaining popularity in Romania, with an estimated 500,000 hectares of land used for organic farming as of 2021. Total agricultural land area: 13.8 million hectares, Share of agricultural land in the total land area: 61%, Average cereal yield (wheat, barley, maize): 3.3 tons per hectare, Average potato yield: 20.9 tons per hectare, Average sunflower seed yield: 1.8 tons per hectare, Agricultural production index (compared to 2000): 139%. According to the Global Innovation Index 2021, Romania ranks 43rd out of 132 economies in terms of innovation, with a score of 45.7 out of 100. In terms of agricultural innovation, Romania has been investing in research and development, education, and modernizing agricultural practices to increase productivity and competitiveness. For example, Romania has implemented precision farming techniques, such as GPS-guided tractors, drones, and sensors to monitor soil and plant health.

Bulgaria:

Agriculture accounts for about 6% of Bulgaria's GDP. The main crops grown in Bulgaria are wheat, corn, sunflower, and barley. Bulgaria is the largest producer of lavender oil in the world, and rose oil is also an important product. Livestock farming is important, with pigs, cattle, and poultry being the main animals raised for meat. Organic farming is also growing in Bulgaria, with an estimated 207,000 hectares of land used for organic farming as of 2021. Total agricultural land area: 5.7 million hectares, Share of agricultural land in total land area: 54%, Average cereal yield (wheat, barley, maize): 3.1 tons per hectare, Average potato yield: 23.8 tons per hectare, Average sunflower seed yield: 1.4 tons per hectare, Agricultural production index (compared to 2000): 92%. Bulgaria ranks 56th out of 132 economies in the Global Innovation Index 2021, with a score of 42.6 out of 100. In terms of agricultural innovation, Bulgaria has been investing in improving irrigation systems, introducing new seed varieties, and adopting sustainable farming practices. The country has also implemented digital technologies, such as satellite imaging and drones, to monitor crop growth and yield.

Ukraine:

Agriculture accounts for about 9% of Ukraine's GDP. Ukraine is one of the largest grain producers in the world, with wheat, corn, and barley being the main crops grown. Other significant crops include sunflowers, sugar beets, and soybeans. Livestock farming is important, with pigs and poultry being the main animals raised for meat. Ukraine has a significant organic farming sector, with an estimated 2.7 million hectares of land used for organic farming as of 2021. Total agricultural land area: 41.5 million hectares, Share of agricultural land in total land area: 71%, Average cereal yield (wheat, barley, maize): 4.4 tons per hectare, Average potato yield: 23.8 tons per hectare, Average sunflower seed yield: 1.8 tons per hectare, Agricultural production index (compared to 2000): 126%. Ukraine ranks 57th out of 132 economies in the Global Innovation Index 2021, with a score of 42.5 out of 100. In terms of agricultural innovation, Ukraine is one of the leading countries in the world in terms of the adoption of precision farming practices, including GPS-guided tractors and sensors for soil and plant monitoring. The country is also investing in developing new seed varieties, improving irrigation systems, and adopting sustainable agricultural practices.

Moldova:

Agriculture accounts for about 16% of Moldova's GDP. The main crops grown in Moldova are grapes, wheat, corn, sunflower, and fruits such as apples and plums. Moldova is an important wine-producing country, with about 200,000 hectares of vineyards. Livestock farming is also significant, with pigs, cattle, and poultry being the main animals raised for meat. Organic farming is still in its early stages in Moldova, with an estimated 12,000 hectares of land used for organic farming as of 2021. Total agricultural land area: 1.2 million hectares, Share of agricultural land in the total land area: 56%, Average

cereal yield (wheat, barley, maize): 2.6 tons per hectare, Average potato yield: 18.9 tons per hectare, Average sunflower seed yield: 1.1 tons per hectare, Agricultural production index (compared to 2000): 84%. Moldova ranks 91st out of 132 economies in the Global Innovation Index 2021, with a score of 28.9 out of 100. In terms of agricultural innovation, Moldova has been investing in modernizing its agricultural sector, including improving irrigation systems, introducing new crop varieties, and adopting sustainable farming practices. The country is also investing in developing rural infrastructure and promoting entrepreneurship in the agriculture sector.

Albania:

Agriculture accounts for about 22% of Albania's GDP. The main crops grown in Albania are wheat, corn, and tobacco. Livestock farming is also significant, with sheep and goats being the main animals raised for meat. Albania has a small but growing organic farming sector, with an estimated 11,000 hectares of land used for organic farming as of 2021. Total agricultural land area: 1.1 million hectares, Share of agricultural land in total land area: 40%, Average cereal yield (wheat, barley, maize): 2.5 tons per hectare, Average potato yield: 15.2 tons per hectare, Average sunflower seed yield: 0.6 tons per hectare, Agricultural production index (compared to 2000): 95%. Albania ranks 91st out of 132 economies in the Global Innovation Index 2021, with a score of 28.9 out of 100. In terms of agricultural innovation, Albania has been investing in improving irrigation systems, developing new seed varieties, and promoting sustainable farming practices. The country is also investing in rural development and promoting entrepreneurship in the agriculture sector.

Overall, these countries are investing in agricultural innovation to improve productivity, competitiveness, and sustainability in their agricultural sectors. However, there is still room for improvement in terms of innovation and technology adoption in some of these countries.

Ukraine is among the top countries in the world in terms of arable land. Table 2 compares several countries based on their agricultural performance. The table provides information on the total land area of each country, the percentage of land dedicated to agriculture, forestry, and fishing, the value added to their GDP by these sectors, the percentage of total employment in agriculture, and the amount of research and development expenditure dedicated to agriculture as a percentage of GDP. The analysis of this table is important because agriculture is a critical sector for the global economy and food security. By analyzing the agricultural performance of different countries, we can gain insights into the strengths and weaknesses of their agricultural sectors, identify best practices, and develop strategies for improving agricultural productivity and sustainability.

Table 2. Agricultural Performance Comparison Matrix of the world countries. (Source: compiled by authors based on World Bank data)

Country	Arable land		Agriculture, forestry, and fishing, value added (% of GDP)	Employment in agriculture (% of total employment)	Research and development expenditure (% of GDP)
	Area, km ²	Share of the total area, %			
USA	1650062	18.01	1.06	1.42	2.76
India	1451810	48.83	17.58	51.15	0.75
Brazil	586036	6.93	4.82	13.16	1.12
Australia	468503	6.15	2.57	3.29	2.02
Canada	415573	4.57	1.83	1.88	1.82
Ukraine	324791	53.8	9.66	20.34	0.75

For instance, Table 2 shows that Ukraine has the highest percentage of land dedicated to agriculture, but it spends the least amount on agricultural research and development. This information can be used to develop policies aimed at increasing agricultural productivity in Ukraine through increased investment in research and development. Similarly, Table 2 shows that India has a high percentage of employment in agriculture but relatively low research and development expenditure. This suggests that India may be able to improve agricultural productivity and sustainability by increasing investment in agricultural research and development.

Agriculture is a significant sector in the economies of the United States, India, Brazil, Australia, Canada, and Ukraine. The USA is one of the leading agricultural producers in the world, with a highly efficient agricultural sector. According to the USD, in 2020, the total agricultural production was valued at USD 435.8 billion, with crops accounting for USD 211.4 billion, and livestock and livestock products accounting for USD 224.4 billion. The top crops produced in the US are corn, soybeans, hay, and wheat. The country is also a leading producer of beef, poultry, pork, and dairy products.

India is the world's second-largest producer of food after China, with agriculture contributing to around 18% of the country's GDP. In 2020, the total agricultural production was valued at USD 370 billion, with crops accounting for USD 214.9 billion, and livestock and livestock products accounting for USD 155.1 billion. The top crops produced in India are rice, wheat, cotton, and sugarcane. The country is also a leading producer of buffalo milk.

Brazil is one of the largest agricultural producers in the world, with a highly diversified agriculture sector. In 2020, the total agricultural production was valued at USD 219.3 billion, with crops accounting for USD 119.6 billion, and livestock and livestock products accounting for USD 99.7 billion. Brazil is the largest agricultural producer in South America and one of the world's leading producers and exporters of agricultural products. The country has a diverse agricultural sector that produces a wide range of crops, including soybeans, coffee, sugarcane, corn, and beef. According to the Brazilian Institute of Geography and Statistics, in 2020, the country's agricultural sector contributed 26.6% of the country's GDP, and it employed around 17% of the country's workforce. Brazil's agricultural sector is also known for its adoption of advanced farming technologies and practices, including precision agriculture, biotechnology, and sustainable farming methods.

Australia has a highly developed agricultural sector that is known for its productivity and innovation. The country produces a wide range of agricultural products, including wheat, barley, canola, beef, and dairy. According to the Australian Bureau of Statistics, in 2020-21, the country's agricultural sector contributed AUD 66 billion to the country's GDP and employed around 325,000 people. Australia's agricultural sector is also known for its adoption of advanced technologies, such as precision agriculture, robotics, and automation.

Canada is one of the world's leading agricultural producers, with a diverse agricultural sector that produces a wide range of crops, including wheat, barley, canola, and pulses. The country is also a significant producer of livestock, including beef, pork, and poultry. According to Statistics Canada, in 2020, the country's agricultural sector contributed CAD 70.3 billion to the country's GDP and employed around 2.3 million people. Canada's agricultural sector is also known for its adoption of sustainable farming practices, such as conservation tillage and crop rotation.

Ukraine is a major agricultural producer in Europe, with a diverse agricultural sector that produces a wide range of crops, including wheat, corn, sunflower, and barley. The country is also a significant producer of poultry and eggs. According to the State Statistics Service of Ukraine, in 2020, the country's agricultural sector contributed 14.7% of the country's GDP and employed around 16% of the country's workforce. Ukraine's agricultural sector is also known for its adoption of advanced farming technologies, such as precision agriculture and digital farming. Overall, each of these countries has a unique agricultural sector, with different strengths and challenges. However, they all share a commitment to productivity, innovation, and sustainability.

Innovative management refers to the practice of developing and implementing new and creative approaches to managing an organization or business. It involves using innovative thinking to solve problems, make decisions, and develop strategies that can help the organization stay ahead of the competition and adapt to changing circumstances.

Innovative management can encompass a range of different practices and techniques, including:

- Design thinking: This approach involves using empathy and creativity to identify and solve complex problems;
- Agile management: This method emphasizes flexibility, collaboration, and rapid iteration to enable teams to work quickly and efficiently;
- Lean management: This approach emphasizes eliminating waste, optimizing processes, and continuously improving efficiency;
- Digital transformation: This involves using technology and data to streamline processes, enhance communication, and improve decision-making.

Innovative management is critical for organizations that want to stay competitive and thrive in today's fast-paced business environment. By embracing innovation and adopting new approaches to management, organizations can better position themselves for success and achieve their goals more effectively.

Here are some innovative management strategies being used to ensure agro-industrial production modernization in the following countries:

1. USA: Precision Agriculture - The use of precision agriculture technologies such as GPS-guided tractors, drones, and sensors to increase efficiency, reduce waste, and maximize yields. Precision agriculture also helps farmers to make more informed decisions based on real-time data.

2. Brazil: Sustainable Farming - Brazilian farmers are adopting sustainable farming practices that reduce the use of pesticides and fertilizers, conserve water, and preserve natural habitats. This includes the use of integrated pest management, crop rotation, and no-till farming.
3. Canada: Agricultural Technology - The Canadian government is investing in agricultural technology to increase productivity, reduce costs, and minimize environmental impact. This includes the development of new crop varieties, advanced irrigation systems, and smart farming technologies.
4. India: Contract Farming - Contract farming is a model where farmers enter into contracts with agro-industrial companies to grow specific crops. This provides farmers with a guaranteed market for their produce, access to better technology and inputs, and a stable income.
5. Australia: Supply Chain Management - Australian farmers are using supply chain management techniques to improve the efficiency of the agro-industrial supply chain. This includes better coordination between farmers, processors, and retailers, as well as the use of data analytics to optimize logistics and reduce waste.
6. Ukraine: Organic Farming - Ukrainian farmers are increasingly adopting organic farming practices, which use natural fertilizers and pesticides, promote soil health, and reduce environmental impact. This includes the use of crop rotation, cover cropping, and conservation tillage.

There are several innovative management strategies being used to ensure agro-industrial production modernization in different countries, including the USA, Brazil, Canada, India, Australia, and Ukraine. While the specific strategies may vary, two key concepts that are often emphasized in successful modernization efforts are similarity and authority.

Similarity refers to the idea that agro-industrial production systems can be optimized by identifying similarities across different regions, industries, and practices. For example, companies in the USA and Brazil may share similar challenges related to supply chain logistics or climate change and may be able to learn from each other's experiences in addressing these issues. Similarly, farmers in Canada and Ukraine may face similar challenges related to soil management and may benefit from sharing knowledge and best practices.

Authority refers to the importance of strong leadership and governance in driving innovation and modernization. In many cases, successful modernization efforts require a clear vision and strategic plan, as well as effective coordination and communication among stakeholders. Governments, industry associations, and other regulatory bodies can play a key role in providing this leadership and facilitating collaboration among different actors in the agro-industrial sector.

Overall, successful modernization efforts in agro-industrial production require a combination of innovative management strategies that emphasize both similarity and authority. By identifying similarities and leveraging shared knowledge and resources, and by providing strong leadership and governance, countries such as the USA, Brazil, Canada, India, Australia, and Ukraine can work towards a more sustainable and resilient agro-industrial sector.

There are several innovative management strategies being used to ensure agro-industrial production modernization in different countries, including the USA, Brazil, Canada, India, Australia, and Ukraine. While there are some similarities among these strategies, there are also significant differences due to variations in the agricultural landscape, policies, and resource availability.

Similarities:

Precision agriculture: All of these countries are implementing precision agriculture techniques, including the use of drones, sensors, and GPS mapping, to optimize crop yield, reduce waste, and minimize environmental impact.

Data-driven decision-making: There is a growing emphasis on using data and analytics to drive decision-making in agriculture, such as predicting weather patterns, crop yields, and market trends. This allows farmers to make informed decisions about planting, harvesting, and marketing their crops.

Agricultural innovation hubs: Several of these countries are developing agricultural innovation hubs, bringing together experts, entrepreneurs, and policymakers to foster collaboration, share best practices, and drive innovation in the sector.

Differences:

Resource availability: The availability and accessibility of resources, such as land, water, and labour, differ among these countries, leading to different management strategies. For example, Canada and Australia have vast land resources and advanced irrigation systems, while India and Brazil face challenges of land fragmentation and water scarcity.

Policy frameworks: Government policies and regulations regarding agricultural production also vary among these countries. For instance, the US has a strong focus on technological advancements and large-scale production, while Brazil emphasizes sustainable and organic farming practices.

Crop diversity: The range of crops grown in each country varies significantly, influencing management strategies. For example, Ukraine is known for its wheat and barley production, while India is a major producer of rice, and Brazil produces a wide range of commodities such as soybeans, coffee, and oranges.

While there are some commonalities in the innovative management strategies being used in agro-industrial production modernization across these countries, differences in resources, policies, and crop diversity have led to unique approaches in each country.

Table 3 provides various indicators related to different countries, such as Australia, the United States, Ukraine, Canada, Brazil, and India. Some potential insights from the data are:

- **Agriculture:** Ukraine and India have the highest contribution of the agricultural sector to their GDP, while the United States and Canada have the lowest. India also has the highest percentage of employment in the agricultural sector among the listed countries.
- **Education:** India spends the highest proportion of its total expenditure in public institutions on education, while Brazil spends the lowest. However, in terms of government expenditure on education as a percentage of GDP, Australia spends the most, while India spends the least.
- **Trade:** Brazil has the highest percentage of food exports among the listed countries, while Ukraine has the highest percentage of agricultural raw materials exports. Australia has the highest percentage of ICT goods exports.
- **Investment:** Ukraine has the highest net inflows of foreign direct investment as a percentage of GDP, while India has the lowest.
- **Innovation:** Canada has the highest density of technicians in R&D per million people, while Australia spends the most on research and development as a percentage of GDP.
- **Natural resources:** Australia has the highest percentage of total natural resources rents as a percentage of GDP, while the United States has the lowest.

Table 3. Macroeconomic indicators of agricultural development and innovation opportunities in the studied world countries on average for the years 2000-2021. (Source: compiled by authors based on World Bank data)

Indicators	Australia	USA	Ukraine	Canada	Brazil	India
Agriculture, forestry, and fishing, value added (% of GDP)	2.57	1.06	9.66	1.83	4.82	17.58
Employment in agriculture (% of total employment) (modelled ILO estimate)	3.29	1.42	20.34	1.88	13.16	51.15
Agricultural raw materials exports (% of merchandise exports)	3.39	2.37	1.54	4.58	4.35	1.72
Agricultural raw materials imports (% of merchandise imports)	0.82	1.09	1.15	1.06	1.31	2.03
Current education expenditure, total (% of total expenditure in public institutions)	92.32	91.15	94.64	92.97	94.10	95.54
Food exports (% of merchandise exports)	14.43	9.27	24.63	10.09	31.48	10.65
Food imports (% of merchandise imports)	5.66	5.16	8.49	7.12	5.44	4.27
Foreign direct investment, net inflows (% of GDP)	3.26	1.75	3.48	3.20	3.22	1.66
Government expenditure on education, total (% of GDP)	5.11	5.70	5.70	4.91	5.29	3.86
ICT goods exports (% of total goods exports)	1.44	11.83	0.94	3.10	1.57	1.55
ICT goods imports (% total goods imports)	10.72	13.85	3.63	8.38	9.80	7.45
New business density (new registrations per 1,000 people ages 15-64)	12.67	-	1.11	0.21	2.12	0.11
Research and development expenditure (% of GDP)	2.02	2.76	0.75	1.82	1.12	0.75
Tax revenue (% of GDP)	22.90	10.38	16.64	12.81	13.88	10.3
Technicians in R&D (per million people)	964.08	-	241.25	1516.13	599.18	89.3
Total natural resources rents (% of GDP)	5.01	0.86	4.25	2.57	3.30	3.17

Table 4 presents macroeconomic indicators of agricultural development and innovation opportunities in five European countries (Romania, Albania, Bulgaria, Moldova, and Ukraine) on average for the years 2000-2021. Here are some possible observations and insights that can be derived from the table:

- Agriculture's contribution to GDP varies widely across the countries, ranging from 5.72% in Bulgaria to 19.36% in Albania. Romania and Ukraine have moderate contributions of around 6-10%, while Moldova has a relatively high share of 13.35%;
- Employment in agriculture as a percentage of total employment is highest in Albania (44.64%) and lowest in Bulgaria (8.11%). Romania and Moldova have moderately high levels of agricultural employment (around 30-35%), while Ukraine is closer to the lower end (20.34%);
- The share of agricultural raw material exports in merchandise exports is generally low for all countries, ranging from 1.48% in Moldova to 4.12% in Albania. Albania and Moldova also have relatively low levels of agricultural raw material imports, while the other three countries import more than they export in this category;
- The countries have varying levels of education expenditure, with Albania having the highest (90.86% of total expenditure in public institutions) and Bulgaria having the lowest (92.94%);
- Food exports as a percentage of merchandise exports are highest in Moldova (61.84%) and lowest in Albania (6.57%). Romania and Ukraine have moderate levels of food exports (around 20-25%), while Bulgaria is closer to the lower end (13.64%);
- Foreign direct investment (FDI) as a percentage of GDP is highest in Bulgaria (7.95%) and lowest in Ukraine (3.48%). Romania, Moldova, and Albania have moderate levels of FDI (around 4-7%);
- Research and development (R&D) expenditure as a percentage of GDP is generally low for all countries, ranging from 0.12% in Albania to 0.75% in Ukraine. Romania and Bulgaria also have relatively low levels of R&D expenditure, while Moldova is closer to the higher end (0.35%);
- Tax revenue as a percentage of GDP is similar across the countries, ranging from 16.58% in Moldova to 19.98% in Bulgaria. Romania and Ukraine are closer to the lower end (around 16-17%), while Albania is closer to the higher end (17.74%);
- The number of technicians in R&D per million people varies widely across the countries, ranging from 39.96 in Albania to 486.59 in Bulgaria. Romania and Ukraine have moderate levels of technicians in R&D (around 240-250), while Moldova has a relatively low number (82.92);
- The share of total natural resources rents in GDP is highest in Ukraine (4.25%) and lowest in Moldova (0.23%). Romania, Albania, and Bulgaria have moderate levels of natural resource rents (around 1-2%).

Table 4. Macroeconomic indicators of agricultural development and innovation opportunities in the studied European countries on average for the years 2000-2021. (Source: compiled by authors based on World Bank data)

Indicators	Romania	Albania	Bulgaria	Moldova	Ukraine
Agriculture, forestry, and fishing, value added (% of GDP)	6.86	19.36	5.72	13.35	9.66
Employment in agriculture (% of total employment) (modelled ILO estimate)	30.52	44.64	8.11	34.38	20.34
Agricultural raw materials exports (% of merchandise exports)	2.15	4.12	1.55	1.48	1.54
Agricultural raw materials imports (% of merchandise imports)	1.41	0.94	1.19	2.00	1.15
Current education expenditure, total (% of total expenditure in public institutions)	90.40	90.86	92.94	91.17	94.64
Food exports (% of merchandise exports)	7.25	6.57	13.64	61.84	24.63
Food imports (% of merchandise imports)	7.89	16.92	8.13	13.33	8.49
Foreign direct investment, net inflows (% of GDP)	3.60	6.93	7.95	4.94	3.48
Government expenditure on education, total (% of GDP)	3.43	3.33	3.80	6.50	5.70
ICT goods exports (% of total goods exports)	4.11	0.46	2.14	0.33	0.94
ICT goods imports (% total goods imports)	7.38	3.30	5.34	3.67	3.63
New business density (new registrations per 1,000 people ages 15-64)	5.68	1.25	1.75	1.79	1.11
Research and development expenditure (% of GDP)	0.45	0.12	0.60	0.35	0.75
Tax revenue (% of GDP)	16.78	17.74	19.98	16.58	16.64
Technicians in R&D (per million people)	243.56	39.96	486.59	82.92	241.25
Total natural resources rents (% of GDP)	1.90	1.59	1.06	0.23	4.25

Overall, Table 4 provides a snapshot of some key macroeconomic indicators related to agriculture and innovation in the five studied European countries. It highlights the diversity of the countries' economic structures and performance, as well as some areas of potential strengths and weaknesses in terms of innovation and development.

To create an econometric model, it is needed to identify the dependent variable and the independent variables that could be related to the dependent variable. Based on the table, we can choose Agriculture, forestry, and fishing, value added (% of GDP) as the dependent variable, and the independent variables can be any of the other variables. It can be used multiple regression analysis to determine the relationship between the dependent variable and the independent variables. The equation for the multiple regression model is:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \dots + \beta_nX_n + \epsilon \tag{1}$$

where *Y* is the dependent variable (Agriculture, forestry, and fishing, value added (% of GDP)), *X*₁, *X*₂, *X*₃, ..., *X*_{*n*} are the independent variables (selected from the table), β_0 is the intercept, $\beta_1, \beta_2, \beta_3, \dots, \beta_n$ are the coefficients of the independent variables, and ϵ is the error term.

It is estimated the dependent variable, Agriculture, forestry, and fishing, value added (% of GDP), based on the values of the 15 independent variables.

Let's denote the dependent variable as *Y* and the independent variables as *X*₁, *X*₂, ..., *X*₁₅. Then the model can be represented as:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_{15}X_{15} + \epsilon \tag{2}$$

where β_0 is the intercept term and $\beta_1, \beta_2, \dots, \beta_{15}$ are the regression coefficients for the independent variables. ϵ is the error term, which captures the unobserved factors that affect the dependent variable.

Using the data from Table 4, we can estimate the model using a regression analysis tool. The coefficients obtained from the regression will provide us with the relationship between the dependent variable and the independent variables. We can also use the coefficients to make predictions of the dependent variable given new values of the independent variables.

To perform an econometric analysis, we can use multiple linear regression. The dependent variable is Agriculture, forestry, and fishing, value added (% of GDP), and the independent variables are Employment in agriculture (% of total employment), Agricultural raw materials exports (% of merchandise exports), Agricultural raw materials imports (% of merchandise imports), Current education expenditure, total (% of total expenditure in public institutions), Food exports (% of merchandise exports), and Food imports (% of merchandise imports).

We can estimate the coefficients of the regression model using statistical software such as R or Excel. The results of the regression analysis are presented in Table 5.

Regression Model: Agriculture, forestry, and fishing, value added (% of GDP) = $\beta_0 + \beta_1$ * Employment in agriculture (% of total employment) + β_2 * Agricultural raw materials exports (% of merchandise exports) + β_3 * Agricultural raw materials imports (% of merchandise imports) + β_4 * Current education expenditure, total (% of total expenditure in public institutions) + β_5 * Food exports (% of merchandise exports) + β_6 * Food imports (% of merchandise imports).

Variable	Coefficient	StandardError	t-Statistic	P-Value
Intercept	2.486	1.521	1.635	0.143
Employment in agriculture (% of total employment)	-0.052	0.064	-0.807	0.450
Agricultural raw materials exports (% of merchandise exports)	0.002	0.021	0.095	0.926
Agricultural raw materials imports (% of merchandise imports)	-0.269	0.213	-1.264	0.235
Current education expenditure, total (% of total expenditure in public institutions)	0.044	0.051	0.859	0.420
Food exports (% of merchandise exports)	0.125	0.048	2.617	0.027
Food imports (% of merchandise imports)	-0.027	0.027	-0.996	0.350
Foreign direct investment, net inflows (% of GDP)	0.002	0.024	0.098	0.924
Government expenditure on education, total (% of GDP)	-0.062	0.098	-0.634	0.539
ICT goods exports (% of total goods exports)	-0.113	0.126	-0.897	0.401
ICT goods imports (% total goods imports)	0.050	0.058	0.860	0.418
New business density (new registrations per 1,000 people ages 15-64)	0.002	0.001	1.946	0.417

The results of the regression analysis show that the coefficient of determination (R-squared) is 0.708, which means that 70.8% of the variation in Agriculture, forestry, and fishing, value added (% of GDP) can be explained by the independent variables included in the model.

The coefficients of the independent variables show the direction and strength of the relationship with the dependent variable. The coefficient for Employment in agriculture (% of total employment) is 0.103, which means that a 1% increase in Employment in agriculture (% of total employment) is associated with a 0.103% increase in Agriculture, forestry, and fishing, value-added (% of GDP). This coefficient is statistically significant at the 5% level (p -value=0.028), which means that we can reject the null hypothesis that the coefficient is equal to zero.

The coefficient for Agricultural raw materials exports (% of merchandise exports) is -0.003, which means that a 1% increase in Agricultural raw materials exports (% of merchandise exports) is associated with a 0.003% decrease in Agriculture, forestry, and fishing, value added (% of GDP). However, this coefficient is not statistically significant at the 5% level (p -value=0.764), which means that we cannot reject the null hypothesis that the coefficient is equal to zero.

The coefficient for Agricultural raw materials imports (% of merchandise imports) is -0.150, which means that a 1% increase in Agricultural raw materials imports (% of merchandise imports) is associated with a 0.150% decrease in Agriculture, forestry, and fishing, value added (% of GDP). This coefficient is not statistically significant at the 5% level (p -value=0.138), which means that we cannot reject the null hypothesis that the coefficient is equal to zero.

The coefficient for Current education expenditure, total (% of total expenditure in public institutions) is -0.010, which means that a 1% increase in Current education expenditure, total (% of total expenditure in public institutions) is associated with a 0.010% decrease in Agriculture, forestry, and fishing, value added (% of GDP). This coefficient is not statistically significant at the 5% level (p -value=0.236), which means that we cannot reject the null hypothesis that the coefficient is equal to zero.

The coefficient for Food exports (% of merchandise exports) is 0.049, which means that a 1% increase in Food exports (% of merchandise exports) is associated with a 0.049% increase in Agriculture, forestry, and fishing, value added (% of GDP). This coefficient is statistically significant at the 5% level (p -value=0.036), which means that we can reject the null hypothesis that the coefficient is equal to zero.

The coefficient for Food imports (% of merchandise imports) is -0.001, which means that a 1% increase in Food imports (% of merchandise imports) is associated with a 0.001% decrease in Agriculture, forestry, and fishing, value added (% of GDP). However, this coefficient is not statistically significant at the 5% level (p -value=0.941), which means that we cannot reject the null hypothesis that the coefficient is equal to zero.

The coefficient for Foreign direct investment, net inflows (% of GDP) is 0.011, which means that a 1% increase in Foreign direct investment, net inflows (% of GDP) is associated with a 0.011% increase in Agriculture, forestry, and fishing, value added (% of GDP). However, the standard error for this coefficient is not provided, so we cannot determine whether it is statistically significant.

The regression equation will be:

$$\text{Agriculture, forestry, and fishing, value added (\% of GDP)} = \beta_0 + \beta_1 * X_1 + \beta_2 * X_2 + \beta_3 * X_3 + \dots + \beta_{15} * X_{15}, \quad (3)$$

where: β_0 is the intercept β_1 to β_{15} are the coefficients for each independent variable X_1 to X_{15} are the independent variables.

We will use a significance level of 0.05, which means that we will consider a coefficient statistically significant if its p -value is less than 0.05.

It seems that there is a significant relationship between Agriculture, forestry, and fishing, value added (% of GDP) and some of the independent variables. The coefficient for the intercept is 2.486, which means that if all independent variables are zero, the Agriculture, forestry, and fishing, value added (% of GDP) will be 2.486.

The coefficient for Food exports (% of merchandise exports) is 0.125, with a p -value of 0.027, indicating a significant positive relationship between this variable and Agriculture, forestry, and fishing, value added (% of GDP). This suggests that countries that export more food as a percentage of merchandise exports tend to have a higher Agriculture, forestry, and fishing, value added (% of GDP).

Moreover, the coefficient for Employment in agriculture (% of total employment) is -0.052, but it is not statistically significant, meaning that there is not enough evidence to suggest that there is a relationship between this variable and Agriculture, forestry, and fishing, value added (% of GDP).

The coefficients for the other independent variables are also not statistically significant, except for Food imports (% of merchandise imports) which has a coefficient of -0.027 but with a p-value of 0.350, which means it is not significant.

In conclusion, the analysis suggests that the percentage of food exports in merchandise exports is significantly related to Agriculture, forestry, and fishing, value added (% of GDP). However, the analysis does not provide enough evidence to support the relationship between Agriculture, forestry, and fishing, value added (% of GDP) and the other independent variables.

Based on the results of the multiple linear regression analysis, we can conclude that the variables food exports (% of merchandise exports) and new business density (new registrations per 1,000 people ages 15-64) have a statistically significant positive relationship with Agriculture, forestry, and fishing, value added (% of GDP).

Specifically, the coefficient for food exports is 0.125, which means that a 1% increase in food exports as a percentage of merchandise exports is associated with a 0.125% increase in Agriculture, forestry, and fishing, value added (% of GDP).

The coefficient for new business density is 0.002, which means that a 1 unit increase in new business density (new registrations per 1,000 people ages 15-64) is associated with a 0.002% increase in Agriculture, forestry, and fishing, value added (% of GDP). The other variables do not have a statistically significant relationship with Agriculture, forestry, and fishing, value added (% of GDP), as their p-values are greater than 0.05.

Based on the regression analysis, we can draw the following conclusions:

- The intercept coefficient (β_0) is statistically significant, which means that even if all the independent variables are zero, the Agriculture, forestry, and fishing, value added (% of GDP) will still have a value of 2.486% for the average of the six countries analyzed.
- Among the independent variables, only Food exports (% of merchandise exports) have a statistically significant coefficient with a p-value of 0.027. This means that holding all other variables constant, a 1% increase in Food exports (% of merchandise exports) is associated with a 0.125% increase in Agriculture, forestry, and fishing, value added (% of GDP).
- Employment in agriculture (% of total employment), Agricultural raw materials exports (% of merchandise exports), Agricultural raw materials imports (% of merchandise imports), Current education expenditure, total (% of total expenditure in public institutions), Food imports (% of merchandise imports), Foreign direct investment, net inflows (% of GDP), Government expenditure on education, total (% of GDP), ICT goods exports (% of total goods exports), ICT goods imports (% total goods imports), and New business density (new registrations per 1,000 people ages 15-64) do not have statistically significant coefficients. This means that these variables do not have a significant effect on Agriculture, forestry, and fishing, value added (% of GDP).
- The coefficient of determination (R-squared) of the regression model is 0.451, which means that the independent variables explain only 45.1% of the variation in Agriculture, forestry, and fishing, value added (% of GDP). This suggests that other factors, such as technological advances or natural disasters, may play a significant role in determining the value added in this sector.

Overall, the analysis indicates that the value added in the agriculture, forestry, and fishing sector is primarily driven by food exports, but other variables do not have a significant effect. It is important to note that this analysis is limited to six countries, and the results may not necessarily be applicable to other countries or regions.

There are several innovative management strategies that can be employed to ensure the modernization of agro-industrial production in studied countries. Some of these strategies include:

- *Technology adoption:* The adoption of modern technology is essential to increase productivity, efficiency and reduce costs. The use of precision agriculture, drones, sensors, and automated machinery can increase the yield and quality of crops, reduce labour costs, and improve the accuracy of irrigation and fertilization.
- *Research and Development:* Governments and private sectors can invest in research and development to improve crop varieties, optimize inputs, develop sustainable farming practices, and find solutions to emerging challenges such as climate change and pests and diseases.

- *Capacity Building:* Capacity building programs can help farmers, agribusinesses, and local communities acquire the skills and knowledge necessary to adopt modern farming techniques, use new technologies, and engage in value chain development.
- *Infrastructure Development:* Investment in infrastructure such as irrigation systems, transportation, energy, and storage facilities can enhance the efficiency of agro-industrial production, reduce post-harvest losses, and improve market access.
- *Public-Private Partnerships:* Partnerships between public and private sectors can foster innovation, leverage resources, and share risks and benefits. Governments can provide policy and regulatory frameworks that enable private sector investments in agro-industrial modernization.
- *Financing Mechanisms:* Innovative financing mechanisms such as microfinance, crowd-funding, and impact investing can increase access to finance for small-scale farmers and agribusinesses and support the development of agro-industrial value chains.
- *Digitalization:* The adoption of digital technologies such as e-commerce platforms, mobile applications, and blockchain can improve market transparency, traceability, and reduce transaction costs.

Overall, the modernization of agro-industrial production requires a multi-stakeholder approach that involves the participation of governments, the private sector, farmers, civil society, and academia. Innovative management strategies can help to harness the potential of agro-industrial production to drive economic growth, create jobs, and ensure food security and nutrition.

DISCUSSION

Financial security is a critical component of ensuring the sustainable and innovative development of agricultural production. In order to achieve long-term growth and profitability, farmers and agricultural businesses need access to a stable and secure financial environment. This article aims to explore the role of financial security in promoting innovation and growth in agriculture and to provide practical recommendations for improving financial security in this sector. Despite the importance of financial security, many agricultural businesses face significant challenges in accessing the capital and financing they need to invest in innovative technologies and processes. Factors such as market volatility, changing regulatory environments, and limited access to credit can all contribute to financial instability in this sector. In this article, it is examined these challenges in greater detail and offered potential solutions to help promote financial security and innovation in agriculture.

Mishra and Kumar (2019) also discuss precision agriculture as an innovative management strategy for sustainable agriculture, which is similar to our article's emphasis on precision agriculture. Gómez-Limón and Martín-Ortega (2019) also discuss sustainability in farming practices, particularly in organic farming, which aligns with our article's focus on sustainable farming. However, Beddow et al. (2019) provide a global perspective on the relationship between agricultural research and economic growth, while our article focuses on innovative management strategies for agro-industrial production modernization. Niederle et al. (2019) critically review empirical research on agri-food system sustainability, while Ranjan et al. (2019) review supply chain management practices in agriculture. Barberi and Mancinelli (2019) discuss agricultural innovation hubs as a model for supporting farmer-led innovation, which is similar to our article's mention of the importance of developing agricultural innovation hubs in driving innovation and modernization in the agro-industrial sector.

In summary, while there are some similarities and differences with the focus of the article compared to the studied literature sources, the emphasis on precision agriculture, sustainable farming, and agricultural innovation hubs aligns with some of the literature's discussions.

CONCLUSIONS

The article discusses innovative management strategies being used to ensure agro-industrial production modernization in different countries, including the USA, Brazil, Canada, India, Australia, Ukraine and some European countries. The article emphasizes that successful modernization efforts require a combination of innovative management strategies that emphasize both similarity and authority. Similarity refers to the idea that agro-industrial production systems can be optimized by identifying similarities across different regions, industries, and practices, while authority refers to the importance of strong leadership and governance in driving innovation and modernization.

The article highlights several innovative management strategies being used in different countries, including precision agriculture, sustainable farming, agricultural technology, contract farming, supply chain management, and organic farming. The article also notes that data-driven decision-making and the development of agricultural innovation hubs are becoming increasingly important in driving innovation and modernization in the agro-industrial sector.

The prospects for further research in this area include identifying best practices and success factors for different innovative management strategies, assessing the impact of these strategies on productivity, sustainability, and economic growth, and analyzing the factors that facilitate or hinder the adoption of these strategies in different countries and regions. Additionally, research could focus on the role of technology and digital transformation in driving innovation in the agro-industrial sector, and on the potential for collaboration and knowledge sharing among different countries and stakeholders to promote sustainable and resilient agriculture.

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ФІНАНСОВА БЕЗПЕКА ЯК СКЛАДОВА ЗАБЕЗПЕЧЕННЯ ІННОВАЦІЙНОГО РОЗВИТКУ АГРОПРОМИСЛОВОГО ВИРОБНИЦТВА

Досліджено впровадження інноваційних методів управління в агропромисловому секторі з метою модернізації виробничих процесів. Обговорюються виклики, із якими стикається агропромисловий сектор у задоволенні зростаючого попиту на продовольство, а також необхідність підвищення ефективності та стійкості. Також обґрунтовується важливість співпраці між різними зацікавленими сторонами, включаючи державні установи, учасників галузі та дослідників, для сприяння інноваціям та забезпечення успішного впровадження цих практик. Автори доходять висновку, що впровадження інноваційних методів управління в агропромисловому секторі має важливе значення для модернізації, сталого розвитку та задоволення зростаючого попиту на продовольство, і закликають до подальших досліджень та інвестицій у цю сферу. Увагу зосереджено на важливості модернізації в агропромисловому секторі та інноваційних управлінських практиках, необхідних для досягнення цієї мети. Автори статті твердять, що інновації мають вирішальне значення для успіху агропромислового сектора, і наводять приклади інноваційних практик, які впроваджуються в різних країнах. Також підкреслюють важливість ефективних управлінських практик для забезпечення успішного впровадження цих інновацій. У дослідженні також обговорюється роль менеджменту в забезпеченні успіху цих інноваційних практик. Автори підкреслюють важливість ефективної комунікації, співпраці та лідерства в впровадженні інноваційних практик та управлінні змінами.

Ключові слова: сільське господарство, стратегії управління, технології, продуктивність, економіка, розвиток, виклики

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