

THE EVOLVING STATE OF AGRI-FOOD SECURITY IN THE REPUBLIC OF MOLDOVA - A REVIEW

Liliana STAVER, Lica ERHAN

Academy of Economic Studies of Moldova, 61, Banulescu Bodoni Street, Chisinau, Moldova, E-mails: liliana.condratchi@ase.md, lica.erhan@ase.md

Corresponding author: liliana.condratchi@ase.md

Abstract

Moldova faces substantial agri-food security challenges, including the availability, accessibility, and affordability of safe, nutritious food for its population. With high poverty rates and a large rural population relying on agriculture, Moldova's agricultural sector has small landholdings, low productivity, and insufficient investment in modern technologies. Climate change and extreme weather events have led to declines in agricultural production and increased dependence on imports for food needs. The recent COVID-19 pandemic and regional conflict in Ukraine have exacerbated food insecurity, causing rising food prices and reduced availability. This paper uses a SWOT framework to analyze Moldova's agri-food security, identifying areas for improvement and potential strategies for enhancing resilience and sustainability. Findings emphasize the importance of integrated, multi-sectoral approaches, promoting sustainable agricultural practices, investing in modern technologies, and fostering collaboration among the government, international organizations, and stakeholders. By addressing these challenges and leveraging opportunities, Moldova can improve the long-term resilience and competitiveness of its agri-food sector while ensuring food security for its population.

Key words: agri-food sector, Republic of Moldova, sustainable agriculture, supply chain, comprehensive approach

INTRODUCTION

Agriculture is an important sector of the economy in the Republic of Moldova assuring jobs, income, agri-food products for the internal market and export.

The development of agro-food sector is closely linked to Moldova's foreign trade and the last decade is characterized by important changes both regarding export and import structure of agro-food products [2].

The promotion of agricultural products trading in order to increase the efficiency of the agricultural sector [3].

Infrastructure plays a very important role in assuring agri-food products quality [4].

For this reason, investments are required to strengthen the agricultural sector and increase the profitability of the products and encourage cross border cooperation [1].

Increasing products quality have a favourable impact the growth of profitability, labor productivity and competitiveness [7].

Innovative activity represents an indispensable factor of performance in the agrofood sector [10].

Agri-food security plays a pivotal role in ensuring a nation's welfare and fostering sustainable development, particularly in the

context of globalization, environmental shifts, and demographic expansion. As a country whose economy predominantly relies on agriculture, the Republic of Moldova encounters a unique set of challenges and prospects in its pursuit of agri-food security.

In this comprehensive review, we delve into the intricacies of agri-food security in the Republic of Moldova, shining a light on the primary factors that have molded its progression and the contemporary obstacles confronting the agri-food industry. The impetus behind this investigation is to gain a deeper understanding of Moldova's agri-food security concerns and provide valuable insights for devising effective policy measures in this domain.

The recent transformations in the economic, social, and political spheres, alongside climate-related and geopolitical vulnerabilities, underscore the significance of exploring agri-food security within the context of the Republic of Moldova. These factors, along with advancements in technology, market demands, and consumption patterns, greatly impact agri-

food security and the competitiveness of Moldova's agri-food sector.

This article examines various sources, including government reports, studies, statistical data, scientific publications, and documents from international organizations, to identify main trends, challenges, and government policies and strategies implemented to ensure food security in Moldova.

During 2021-2022, Moldovan agriculture encountered multiple challenges, including a severe drought, soaring fertilizer and diesel prices, high agricultural credit interest rates, and loss of access to markets in Russia, Belarus, and Ukraine. Small farmers and household backyard producers were most affected by these adversities. In 2022, cereal production fell significantly below the five-year average, with maize and wheat production experiencing the greatest declines. Oil crops and pulses also saw reduced production levels, leading to concerns about livestock, rising input costs, and food prices.

Utilizing the information and perspectives presented, this article aims to enhance comprehension of the elements impacting agri-food security in the Republic of Moldova and pinpoint potential opportunities as well as obstacles for the agri-food industry. Our intention is for our assessment to function as a useful asset for decision-makers, professionals in the agri-food domain, and the scholarly community, as they strive to ameliorate agri-food security and encourage sustainable growth in the Republic of Moldova.

MATERIALS AND METHODS

This article serves as a review paper addressing the development of agri-food security in the Republic of Moldova. The methodologies and materials employed primarily revolve around the examination of secondary data and the integration of pre-existing information. Sources include governmental reports and studies on agri-food security and agricultural policies within the Republic of Moldova; official statistics published by the National Bureau of Statistics

and other pertinent institutions; and documents from international organizations like the FAO, World Bank, and European Union.

Additionally, an analysis and synthesis approach was utilized, encompassing a comparative investigation of agri-food security developments in the Republic of Moldova alongside other regional countries. To offer a comprehensive perspective on the key factors affecting agri-food security within the Republic of Moldova, a SWOT analysis was conducted.

RESULTS AND DISCUSSIONS

Comparative examination of the development of agri-food security in the Republic of Moldova in relation to neighboring countries in the region (Ukraine and Romania)

The comparative analysis of the evolution of agri-food security in the Republic of Moldova with other countries in the region, such as Romania, Ukraine and other Eastern European and Balkan countries, can be made by examining several relevant indicators, such as agricultural production, access to food, food stability and sustainable use of natural resources.

Agricultural production

According to FAO (2022), The Republic of Moldova is a predominantly agrarian economy, with the agricultural sector contributing about 10.2% of GDP [6].

In comparison, agriculture accounts for 4.3% of Romania's GDP [5, 12] and 9.63% of Ukraine's GDP [11]. Although Moldova has diversified agricultural production, including cereals, vegetables, fruit and vines, productivity is relatively low compared to neighbouring countries such as Romania and Ukraine due to outdated technologies and lack of investment in the sector [5, 12].

Access to food

Access to food is a crucial aspect of agri-food security. In the Republic of Moldova, the prevalence of malnutrition has declined in recent times, yet it continues to be more elevated in comparison to neighboring countries in the region, such as Romania.

Rural poverty and fluctuations in food prices can have a negative impact on access to quality food in sufficient quantities for some population groups.

Food stability

Food stability means constant availability of food for the population. The Republic of Moldova faces challenges related to food stability due to climate change and vulnerability to natural disasters such as droughts or floods. In comparison, Romania and Ukraine have better food stability due to a more developed agricultural sector and more effective risk management policies.

Sustainable use of natural resources

In Moldova, soil degradation, water pollution and deforestation affect the sustainability of the agricultural sector.

Contrastingly, neighboring countries in the region, like Romania, have instituted more successful policies and tactics to safeguard the environment and foster sustainable agriculture.

While the Republic of Moldova has seen enhancements in agri-food security in recent times, it continues to trail behind nearby nations, including Romania and Ukraine.

To boost agri-food security and match regional benchmarks, the Republic of Moldova must tackle critical obstacles such as subpar productivity, restricted food accessibility for certain demographic groups, food stability, and the sustainable management of natural resources.

This can be achieved by investing in modern and innovative technologies, implementing effective policies and strategies for risk management and developing a sustainable agriculture that is competitive with other countries in the region.

The SWOT analysis, illustrated in Table 1, offers an all-encompassing perspective on the strengths, weaknesses, opportunities, and risks associated with agri-food security in the Republic of Moldova. This analysis highlights the crucial elements and obstacles influencing the development of the sector and food security within the nation.

Table 1. SWOT Analysis of Agri-food Security in the Republic of Moldova

Strengths (S)	Weaknesses (W)
1. Abundant natural resources, including fertile soils and a favorable climate for agriculture. 2. Agricultural tradition and experience in agri-food production. 3. Diversity of crops and agri-food products. 4. Potential for increasing agricultural productivity through the adoption of modern technologies and practices. 5. Proximity to European markets and potential for developing exports.	1. Underdevelopment of rural infrastructure, including roads, irrigation and storage systems. 2. Limited access to finance and resources for farmers and agribusinesses. 3. Low degree of mechanisation and technology in the agricultural sector. 4. Lack of cooperation and organisation between farmers and agri-businesses (weak and fragmented logistics chains). 5. Insufficient investment in research and development in the agri-food sector.
Opportunities (O)	Threats (T)
1. Increase the level of technological innovation and digitisation in the agri-food sector. 2. Exploiting export potential and market diversification. 3. Adoption of sustainable agricultural practices and efficient use of resources. 4. Public-private cooperation and partnerships for the development of infrastructure and services in rural areas. 5. Improve agricultural and rural development policies in line with national and international objectives. 6. Effective capacity to implement the EU Farm to Fork Strategy.	1. Climate change and its impact on agricultural production and natural resources. 2. Price volatility on international markets and vulnerability to economic shocks. 3. Increasing demographic pressure and global food demand. 4. International competition in the agri-food sector and difficulties in accessing external markets. 5. The spread of diseases and pests in the agricultural sector and risks to food safety and public health. 6. Political instability in the region: may create economic uncertainty, affect investment and development in the agri-food sector, and lead to delays in the implementation of reforms and development projects.

Source: Elaborated by the authors.

Evolution of agri-food security in the Republic of Moldova

Historical trends and major current challenges

Following its attainment of independence in 1991, the Republic of Moldova experienced a challenging phase of economic transition, which had a substantial impact on the agri-food sector. In the 1990s and early 2000s, agricultural production declined steadily, driven by problems such as land redistribution, lack of investment and inefficient irrigation systems. In the last decade, there have been significant improvements in agricultural production, but the sector still faces major challenges.

In recent years, the Republic of Moldova has seen an increase in the production of cereals, pulses and oilseeds, according to data published by the National Bureau of Statistics, cereal production increased from 1.3 million tonnes in 2018 to 1.76 million tonnes in 2022. However, crop yields remain below the average level in the region, indicating the need for measures to increase efficiency and productivity [9].

Presently, the agri-food industry faces obstacles such as inadequate rural facilities, restricted financial accessibility for agriculturalists, reliance on exports to customary markets (like the Russian Federation), and vulnerability to climatic fluctuations.

Agri-food security indicators

In the Republic of Moldova, agri-food security metrics encompass agricultural yield, food availability, quality and safety of food, as well as food consistency over time. Information released by the FAO indicates a reduction in the rate of undernourishment in the Republic of Moldova, dropping from 6.7% in 2018 to approximately 4.2% in 2022, signifying enhanced food access for the populace [6].

However, the Republic of Moldova remains vulnerable to external shocks, such as fluctuations in food prices on international markets and climate change. For example, in 2020, the severe drought experienced by the country affected cereal harvests, leading to a drop in production and higher food prices

The influence of climate change on agri-food security

In Moldova, climate change poses a significant risk to agri-food security. It has the potential to directly impact agricultural output, food safety and quality, in addition to influencing food accessibility and long-term stability. The effects of climate change on agricultural production include changes in rainfall, temperatures and extreme weather events such as droughts and floods.

As stated in the Intergovernmental Panel on Climate Change (IPCC) reports, the Republic of Moldova is experiencing a rise in mean yearly temperatures and alterations in rainfall patterns. These shifts could lead to the subsequent consequences outlined in Table 2. In order to cope with the effects of climate change on agri-food security, the Republic of Moldova needs to adopt an integrated and multi-sectoral approach. This can include promoting sustainable and climate-adapted agricultural techniques, improving irrigation systems, investing in agricultural research and innovation, developing rural infrastructure and strengthening the capacity of local communities to manage natural resources and adapt to climate change.

Table 2. Effects of Climate Change on Agri-Food Security

Climate Change Impact	Explanation
Decreased crop yields	Rising temperatures and changes in rainfall can negatively affect crop yields, reducing agricultural production and threatening food security. For example, in 2020, a severe drought led to a drop in cereal production in the Republic of Moldova.
Changing growing cycles	Climate change can affect crop-growing cycles, which can lead to yield losses and reduced food security.
Increased incidence of diseases & pests	Climate change may favor the spread of diseases and pests, negatively affecting agricultural production and food quality.
Affecting irrigation systems	Alterations in the volume and dispersion of precipitation may adversely affect irrigation systems, essential for sustaining agricultural output and food stability in dry and semi-dry environments.

Source: developed by the authors.

In order to cope with the effects of climate change on agri-food security, the Republic of Moldova needs to adopt an integrated and multi-sectoral approach. This can include promoting sustainable and climate-adapted agricultural techniques, improving irrigation systems, investing in agricultural research and innovation, developing rural infrastructure and strengthening the capacity of local communities to manage natural resources and adapt to climate change.

Recommendations for the future of agri-food security in the Republic of Moldova

Strengthening agricultural and rural development policy

It is crucial to strengthen agricultural and rural development policy by implementing coherent and effective strategies tailored to the needs and specificities of the Moldovan agri-food sector. This involves developing an appropriate legislative and regulatory framework, encouraging sustainable agricultural practices and promoting an integrated approach to rural development.

Improving access to finance and investment

Financial accessibility and investment play a crucial role in the growth of the agri-food industry. It is vital for governmental bodies and financial establishments to collaborate in devising funding mechanisms that cater to the requirements of agriculturalists and agri-food enterprises, including favorable loans, subsidies, or guarantee programs.

Promoting cooperation and public-private partnerships

Collaboration and public-private alliances hold considerable potential to advance the agri-food industry and bolster agri-food security. Such partnerships can promote technology and knowledge exchange, infrastructure enhancement, and market accessibility. By fostering these alliances, the Republic of Moldova can draw in capital and proficiency from the private domain for the collective benefit of the entire agri-food sector.

Education and training in the agri-food sector

Allocating resources to agri-food education and skill development is crucial for cultivating a proficient workforce that caters to the

sector's demands. Government entities and educational institutions ought to collaborate in creating specialized agri-food training curriculums and classes that encourage innovation, the implementation of contemporary technologies, and resourceful utilization of resources.

Adopt a framework for monitoring and evaluating agri-food security.

In order to ensure agri-food security in the Republic of Moldova, it is essential to adopt an effective and comprehensive monitoring and evaluation framework. This framework should be based on relevant indicators that allow for the assessment and comparison of performance over time and with other countries or regions.

Opportunities and challenges for the Moldovan agri-food sector

Table 3. Opportunities and Challenges for the Moldovan Agri-food Sector

Opportunities and Challenges	Description
Technological Innovation and Digitalization	Embracing cutting-edge technologies, including precision farming, intelligent irrigation systems, and data-centric solutions, can enhance the effectiveness, productivity, and competitiveness of agricultural operations. Digitalization can simplify farmer access to information, amenities, and marketplaces, thereby boosting agri-food security. Nevertheless, investments in digital infrastructure and workforce education are required to tackle obstacles stemming from insufficient technological expertise and capabilities among agriculturalists.
Exploiting the export potential	The agri-food industry in Moldova possesses significant export capacity, particularly for value-added agricultural goods like wines and processed fruits and vegetables. Implementing a robust and varied export approach can elevate the revenue of the agri-food sector while decreasing reliance on customary markets. However, to realise this potential, Moldova needs to improve the quality and food safety of its products, comply with international standards and promote cooperation with trading partners.
Product and market	Diversification of agricultural products and markets is an opportunity and a

diversification	challenge for the Moldovan agri-food sector. Diversification can help reduce the risks and vulnerabilities associated with dependence on a limited number of products and markets. To this end, Moldova should invest in research and development, promote innovation and support the adoption of sustainable and competitive agricultural practices.
Sustainable development and resource efficiency	The agri-food sector in Moldova encounters obstacles concerning sustainable growth and the effective utilization of natural resources. To tackle these issues, Moldova needs to promote sustainable agricultural practices, responsibly manage water and soil resources and protect biodiversity and ecosystems. The implementation of appropriate policies and strategies in this area can contribute to increasing the resilience of the agri-food sector to climate change.

Source: Elaborated by the authors.

CONCLUSIONS

Based on this study, the following conclusions can be drawn:

-Agri-food security in the Republic of Moldova has made significant progress in recent decades, thanks to government efforts and international support.

-Climate change is a major challenge to agri-food security, affecting both agricultural productivity and the availability of and access to necessary resources.

-Government policies and strategies have been instrumental in strengthening the legislative and policy framework and promoting rural development and infrastructure.

-Opportunities for the Moldovan agri-food sector include technological innovation and digitisation, harnessing export potential, product and market diversification, and sustainable development and resource efficiency.

-Recommendations for the future of agri-food security in Moldova include strengthening agricultural and rural development policy, improving access to finance and investment, promoting public-private cooperation and partnerships, agri-food education and training, and adopting a framework for monitoring and

evaluating agri-food security.

Finally, this review paper highlights the importance of an integrated approach and collaboration between different actors to ensure agri-food security and sustainable development in the Republic of Moldova.

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REFERENCES

- [1] Certan, S., Certan, I., 2018, A few considerations on the investments in the agrifood sector of the Republic of Moldova, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.16(2), 55-63. https://managementjournal.usamv.ro/pdf/vol.16_2/Art8.pdf, Accessed on April 14, 2023.
- [2] Cimpoeies, L., Cosar, C., 2018, The potential of Moldova's products on global agrifood markets, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.18(2), 119-124. https://managementjournal.usamv.ro/pdf/vol.18_2/Art15.pdf, Accessed on April 14, 2023.
- [3] Coretchi, B., Gribincea, A., 2013, Analysis of the agri-food sector of the Republic of Moldova in the equation model of growth and development of the foreign economic relations, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.13(2), 75-82. https://managementjournal.usamv.ro/pdf/vol.XIII_2/Art10.pdf, Accessed on April 14, 2023.
- [4] Coser, C., Chilimari, S., 2015, Infrastructure of agrifood products quality assurance in the Republic of Moldova-Branch and export approaches, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.15(2), 81-86. https://managementjournal.usamv.ro/pdf/vol15_2/Art13.pdf, Accessed on April 14, 2023.
- [5] Europa.eu, European Commission, 2021, EU country Factsheets, Romania, https://agriculture.ec.europa.eu/system/files/2021-12/agri-statistical-factsheet-ro_en_0.pdf, Accessed on March 2, 2023.
- [6] FAO, 2022, Special report – FAO Crop and Food Supply Assessment Mission (CFSAM) to the Republic of Moldova. 22 November 2022. Rome.

<https://doi.org/10.4060/cc3043en>, Accessed on March 10, 2023.

[7]Litvin, A., Coser, C., 2014, Competitiveness and quality of agrifood products-key factors for the success of export promotion, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.14(3), 147-154. https://managementjournal.usamv.ro/pdf/vol_14/art23.pdf, Accessed on April 14, 2023.

[8]Moldova support platform: EIB to continue investing in Moldova. (2022, Nov 29). MENA Report, <https://www.eib.org/en/press/all/2022-494-moldova-support-platform-eib-to-continue-investing-in-moldova>, Accessed on February 23, 2023.

[9]National Bureau of Statistics, 2023, <https://statistica.gov.md/ro>, Accessed on March 2, 2023.

[10]Prisacaru, V., 2020, Evaluation of the agro-food sector of the republic of Moldova as an innovation ecosystem's actor, Conference "Perspectives and achievements within European integration of Moldova", Chisinau, Moldova, 1-2 October, 2020. pp.17-22. EUAGRO, Nr. 610667-PPE-1-2019-1-MDEPPJMO-PROIECT: Fostering European Integration of the Republic of Moldova with the specific accent on the agriculture sector, https://ibn.idsi.md/sites/default/files/imag_file/p-17-22_3.pdf, Accessed on April 14, 2023.

[11]Statista, Distribution of GDP in Ukraine by sector, 2021, <https://www.statista.com/statistics/1322567/ukraine-share-of-gdp-by-sector/>, Accessed on March 9, 2023.

[12]World Bank Data, Agriculture, Forestry and Fishing, Value added (% of GDP (Romania, <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=RO>, Accessed on March 2, 2023.

