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REGIONAL DYNAMICS OF SUNFLOWER PRODUCTION AND ITS ROLE IN ENSURING FOOD SECURITY

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• Abstract

***.**Food security represents a fundamental component of national and global security, being closely linked to the efficient and sustainable management of available resources. In the context of contemporary challenges characterized by demographic trends, shifts in agricultural production, and pressures on natural resources, food security remains a global priority. Sunflower seed production is an important factor in ensuring food security, by providing vegetable oil for human consumption and by-products used in animal feed. The paper analyzes the evolution of sunflower production in Romania and neighboring countries, highlighting the main trends and fluctuations in production, as well as the influence of climatic, technological and economic factors on it. The research aims to highlight the role of sunflower production in strengthening regional food security and to identify directions for adaptation and sustainable development of the agricultural sector. The analysis of sunflower seed production in 2022 highlights Ukraine's dominant position in the Eastern European region, with a production of approximately 11.33 million tons, followed by Bulgaria and Romania, with 2.14 million tons and 2.11 million tons, respectively. These differences reflect the importance of the agricultural sector in the regional economy and the relevance of comparative analysis of production for assessing its contribution to food security.*

• Introduction

Food security represents a fundamental component of human and national security, playing an essential role in ensuring public health, social stability, and sustainable economic development. Access to sufficient, safe, and nutritious food is an indispensable condition for the normal conduct of human activities and the fulfilment of fundamental human rights. In this context, ensuring food security is a major responsibility of states, as well as a shared concern at the regional and international levels, given the interdependence between natural resources, agricultural production, demographic developments, and the functioning of agri-food markets (ABDELRAHMAN, 2006; BALAN, 2023).

In Romania, food security must be analyzed in close connection with the effective use of the country's agricultural potential, the modernization of agricultural holdings, the efficient management of natural resources, and the strengthening of production and distribution capacity.

• Material and method

The study material of this research is the total production of sunflower seeds (*Helianthus annuus* L.) carried out in Romania and neighboring countries, to highlight its evolution over time and identify differences between the analyzed countries. To carry out the study, the following research methods were considered: the bibliographic research method, used to establish the theoretical foundation for the study regarding the importance of sunflower seeds, the comparative method, applied to highlight the differences between Romania and neighboring states, as well as the changes recorded over the analyzed period and the dynamic analysis method, used to identify trends of increase or decrease in production from one year to the next. The interpretation of the results focused on identifying general production trends, annual variations, and differences between Romania and its neighboring states; the results being also discussed in relation to factors such as climatic conditions, cultivated areas, agricultural productivity and the economic importance of the crop.

• Results and discussions

Analysis of the dynamics of total sunflower production in Romania, Hungary, Bulgaria, and Serbia during the 1992–2005 period

Romania and Ukraine stand out as the largest producers of sunflower seeds in the region. Ukraine recorded the highest production volumes each year, reaching a peak of 4.706.100 tonnes in 2005. Romania also had significant growth, with a peak production of 1,557.813 tonnes in 2004. Hungary and Bulgaria had variable but significant production. Hungary recorded a steady increase, reaching 1.186.180 tonnes in 2004. Bulgaria experienced fluctuations but reached a peak of 1.078.832 tonnes in the same year. Moldova had the lowest production volumes of the five countries, but it also recorded growth, reaching a peak of 390.000 tons in 2003. During the period 1992–1996, all countries underwent major economic transformations. Ukraine and Romania maintained high production volumes due to their large, cultivated areas and favorable conditions. Bulgaria and Hungary experienced fluctuating production levels, while Moldova recorded the lowest output. The year 1995 was particularly favorable for Ukraine, with a significant increase in production, reaching 2.860.000 tones. This may have been due to investments in agriculture and the adoption of more advanced technologies. During the period 1997–2001, production stabilized and increased slightly in most countries. Hungary and Bulgaria began to record more consistent growth. In 1999, Hungary and Bulgaria experienced significant increases in production, reaching 792.928 tonnes and 605.832 tonnes, respectively. Moldova continued to record the lowest production levels, but experienced a slight increase in 1999, reaching 285.551 tonnes. Starting in 2002, a significant increase was observed across all countries. Ukraine continued to dominate the market, reaching a peak of 4.706.100 tonnes in 2005. This growth can be attributed to massive investments in agriculture and the modernization of agricultural infrastructure. Romania reached a high of 1.557.813 tonnes in 2004, indicating an improvement in the efficiency of agricultural processes and the adoption of modern practices. Hungary and Bulgaria continued to grow, each reaching over 1 million tonnes in 2004. Moldova, although it remained behind the other countries, recorded a notable increase, reaching 390.000 tonnes in 2003. The evolution of sunflower seed production in Eastern Europe between 1992 and 2005 reflects the economic transition and agricultural modernization in these countries. Ukraine and Romania stood out as regional leaders due to their extensive cultivated areas and investments in agricultural technologies. Hungary and Bulgaria demonstrated steady and significant growth, while Moldova experienced a more modest growth rate.

• Conclusions

Sunflower seed production plays an essential role in global food security management, as it is a vital source of vegetable oil rich in vitamin E and essential fatty acids. Sunflower oil is widely used in cooking, the food industry, and margarine production. By-products of seed processing, such as oilcakes and meals, are used as animal feed, indirectly contributing to food security by supporting meat and dairy production. Romania recorded a production of 2.106.570 tonnes, reflecting investments in agricultural infrastructure and the use of high-quality hybrid seeds. Investments in agricultural infrastructure are essential to support farmers and improve productivity. Efficient irrigation systems, modern equipment, and processing facilities play a crucial role. Furthermore, investments in research and development are vital for developing new sunflower varieties that are more resistant to climate change and pests.