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AGRICULTURAL RESEARCH AS A RESPONSE TO THE STRUCTURAL CHALLENGES OF THE ROMANIAN AGRI-FOOD SECTOR

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Abstract: This paper analyzes the interaction between the structural challenges of the Romanian agri-food sector and the capacity of the agricultural research, development, and innovation (RDI) system to provide tailored solutions. Based on a literature review addressing structural polarization of farms, productivity deficits, and economic fragmentation, the study highlights the need for strategic restructuring grounded in technology transfer and digitalization. The assessment of Romania's current agricultural research framework reveals valuable genetic, institutional, and human resources, yet hindered by underfunding, outdated infrastructure, and limited capacity for transfer to the productive environment. The conclusions emphasize that agricultural research can become a key instrument for enhancing the resilience and competitiveness of Romanian farmers, provided that cooperation between RDI institutions, the economic sector, and coherent public policies is strengthened.

Material and method

The primary objective of this research is to analyze how agricultural research contributes to addressing the structural challenges of the Romanian agri-food sector, with a focus on climate change adaptation, agricultural digitalization, technology transfer, and integration into public policies.

The study is based on the analysis of bibliographic references, including strategic and legislative documents (MARD Strategy 2023–2030, NRDP 2014–2020, National Climate Change Adaptation Plan, European Green Deal), statistical data (Romanian Statistical Yearbook, Eurostat, FAO), research reports from RADS Lovrin, and scientific literature.

The research method consists of a documentary analysis of the aforementioned sources.

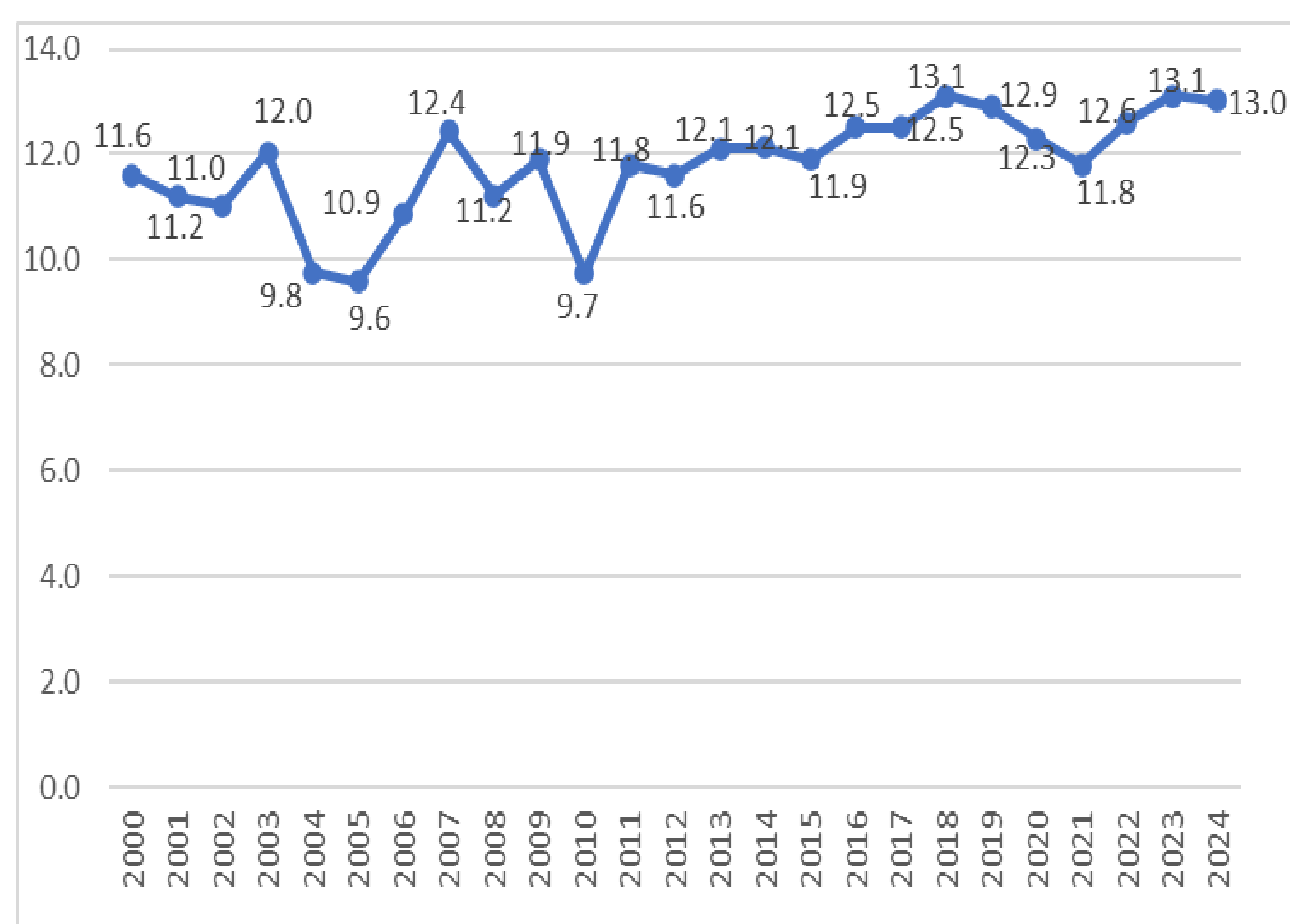


Figure 1. Evolution of average temperature in Romania during 2010-2024 (degrees Celsius)

Source: Archive of the Lovrin Agricultural Research and Development Station

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Results and discussions

Romanian agriculture faces deep structural problems, which limit the competitiveness and sustainability of the sector: one of the most fragmented agricultural structures in the EU, with over 2.8 million farms in 2020, but an average area of only 3.6 hectares per farm; over 60% of farmers are over 55 years old, and young people are increasingly less interested in agriculture; most farms are subsistence or semi-subsistence, with an economic value of less than 2,000 euros/year [16,11,12].

RDI institutions in Romania carry out research programs and projects on the following topics: crop adaptation to heat and water stress (varieties resistant to drought and high temperatures are tested, including through genetic selection and biotechnology), soil and carbon management (research focuses on moisture conservation practices, crop rotation and soil carbon sequestration), climate modeling and agroclimatic scenarios (research institutes collaborate with the National Agricultural Ministry to anticipate the impact until 2050–2070, with a focus on drought, heat stress and declining yields), adaptive agriculture (flexible production systems, agroecology and digitalization are promoted for better climate risk management).

Conclusions

In conclusion, agricultural research is not just a technical response to structural challenges, but a vital component of a vision of sustainable, competitive and resilient rural development. Romania has the human, natural and institutional resources necessary to transform agricultural research into an engine of progress, provided there is a strong political will, adequate funding and genuine collaboration between the actors involved. By strengthening collaborations, digitizing processes and integrating results into agronomic practices, Romania can effectively respond to climate challenges and actively contribute to the European ecological transition.

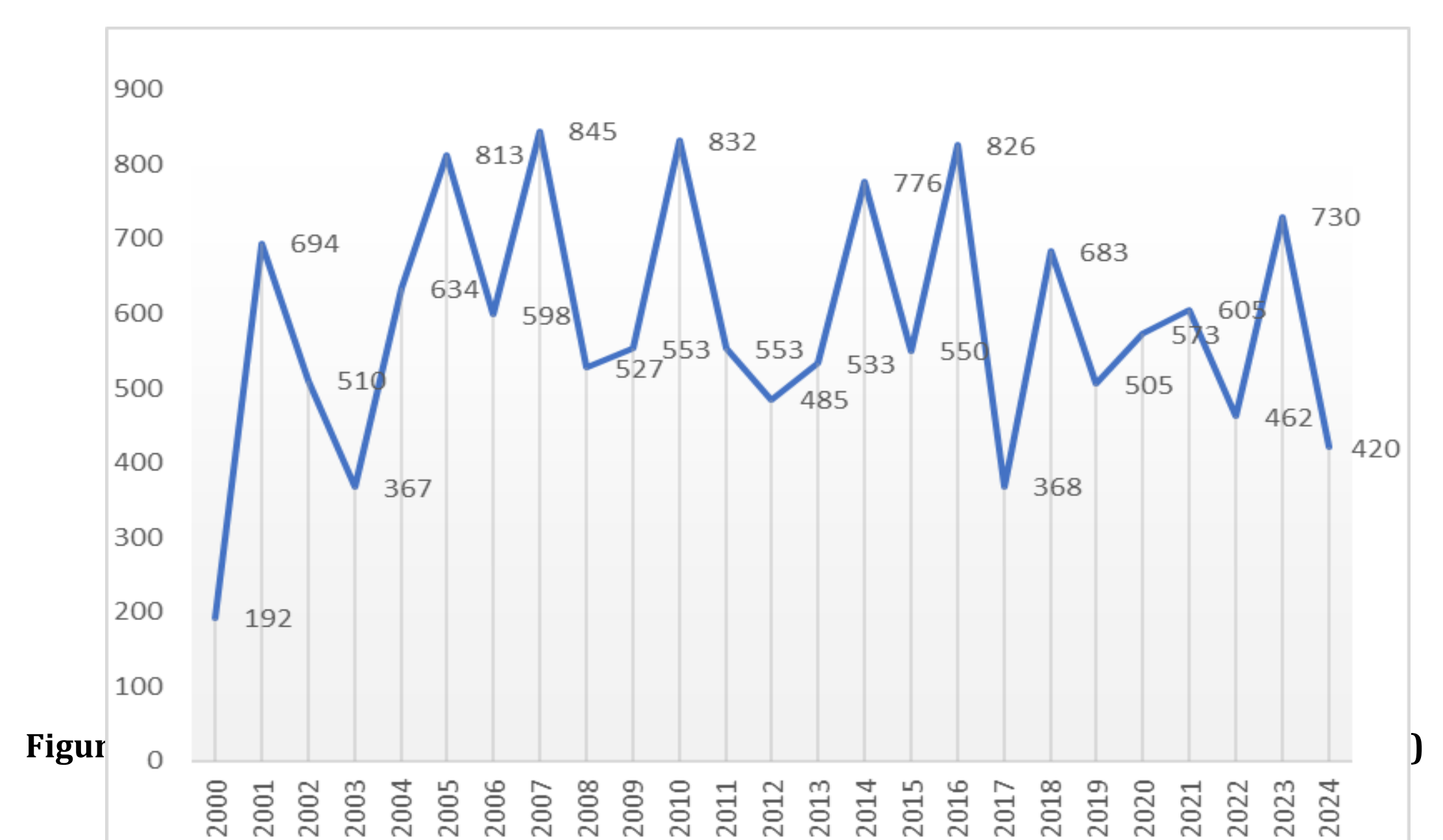


Figure 2. Evolution of precipitation in Romania during 2000-2024