SUMMARY

RESEARCH ON FARM MANAGEMENT OPTIMIZATION IN MEDIUM-SIZED AGRICULTURAL HOLDINGS

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In a globalised and rapidly changing agricultural economy, medium-sized farms are often caught in a "middle ground", where they cannot benefit from the economies of scale of large farms but are still large enough to be affected by higher operating costs than small farms. On the one hand, they must face economic and technological pressures, and on the other, they must respond to increasingly complex requirements regarding sustainability, traceability and product quality. For these reasons, management optimization becomes essential for the success and viability of these farms.

This paper is structured in 6 chapters, including conclusions and recommendations.

In Chapter I, entitled "Theoretical foundations of management in agricultural farms", I presented the concept of agricultural management, its principles and functions, examples of agricultural management models that can be applied in agricultural farms, and I highlighted the role of technology in the management of agricultural farms.

In farm management, business concepts are applied to agricultural activities to maximize the use of capital, labour, and land to meet objectives such as sustainability and profitability. Strategic decision-making and efficient allocation of resources are crucial in this multidisciplinary field that combines economics, agronomy and environmental science. Financial management, production methods, risk reduction, marketing strategies, resource allocation and sustainability practices are all covered.

Traditional management, modern management, integrated management, sustainable management, and cooperative management are models of agricultural management that offer various approaches and strategies for optimizing operations in agricultural farms, each with specific advantages and disadvantages. Choosing the right model depends on the local context, available resources and farm objectives.

The implementation of modern technologies in agriculture allows farmers to better manage their resources, increase productivity and improve the sustainability of their operations. From the use of drones and monitoring systems to precision agriculture and IoT integration, technology brings many benefits that can radically transform the way farming is done.

The classification of medium-sized economic farms, their structure and organization, and the specific problems and challenges they face are presented in Chapter II, entitled "Characteristics of medium-sized agricultural farms".

The classification of farms of medium economic size is essential to understand the agricultural structure of a region and to develop appropriate agricultural policies. This varies according to the local and economic context, but common criteria include agricultural area, income, number of employees and value of production.

Depending on the economic size, commercial farms / medium-sized agricultural holdings have an economic size between 12,000 - 250,000 Euros and sell their entire agricultural production.

Farms of medium economic size have the following characteristics: they have a varied range of crops and/or animals, to reduce risk and optimize the use of resources; have sufficient financial resources to invest in modern technologies such as irrigation equipment, high-performance agricultural machinery and agricultural management software; tend to be more efficient than small farms due to the ability to implement more advanced farming practices and benefit from economies of scale; they have enough flexibility to adapt to market changes and new regulations, but do not have the same bureaucratic and infrastructural constraints as large holdings; they play an important role in the rural economy, contributing to job creation and the development of local communities.

The structure and organization of medium-sized farms are characterized by a combination of flexibility and operational efficiency. These farms are large enough to benefit from economies of scale and modern technologies but are also able to adapt quickly to market changes and new environmental demands. Their organization includes a well-defined departmental structure, effective resource and employee management strategies, and a strong focus on sustainability and environmental responsibility.

Medium-sized farms face several specific challenges, from limited access to finance and technology, to risk management and access to markets. To overcome these challenges, farmers must adopt sustainable farming practices, invest in staff training and develop effective marketing strategies. Also, collaboration with other farms and active participation in agricultural organizations can help influence policies and access the resources needed for the growth and sustainable development of medium-sized farms.

In Chapter III, "Bibliometric analysis of economic optimization in agriculture", a bibliometric analysis is carried out starting from the keywords "economic optimization in agriculture" in the Scopus search engine. Initially, the search yielded a total of 1,604 publications on this topic. Next, we applied a series of filters to refine the results - reducing the number of publications to 1,366 relevant papers that explore economic optimization from diverse perspectives, from technological innovations and management practices to energy solutions and economic models. A detailed analysis of these works can contribute to the integrated understanding of economic optimization in agriculture and its impact on sustainability and efficiency in the agricultural sector.

The analysis of the number of publications shows that economic optimization in agriculture has become more and more important in the scientific literature. The steady increase in the number of publications over the last decade, especially after 2017, reflects the increasingly pressing concerns about the efficiency and sustainability of agriculture in the face of global challenges. This trend suggests that the topic will continue to be widely explored in the years to come, given the ongoing need to optimize agricultural resources and processes.

The bibliometric analysis carried out - the distribution of terms, co-occurrences and identified clusters, based on 1,366 publications, highlighted the main research directions in economic optimization in agriculture: sustainability and management of natural resources - efficient use of resources, especially water and land, to respond to the challenges of climate change; emerging technologies and agricultural automation - growing interest in agricultural automation through artificial intelligence and optimization algorithms; the economic and social importance of decisions in agriculture - research focuses on the economic and social analysis of agricultural decisions, assessing their impact on costs, efficiency and regional development; multi-objective optimization and increasing productivity - efforts to maximize agricultural productivity, improve the yield and efficiency of agricultural crops, use advanced optimization techniques to balance costs, yield and sustainability in agriculture; water resources management and strategic decision-making - optimizing water use is a crucial topic in agriculture, efficient management of water resources is a priority, and decision-making based on complex data is essential in modern agricultural processes.

In Chapter IV, "Management optimization strategies in medium agricultural farms" are presented, highlighting the importance of strategic planning, efficient use of resources, modern technologies, optimization of production processes and performance evaluation.

Agriculture is a fundamental pillar of the world economy, and the efficient management of medium-sized agricultural farms is becoming increasingly crucial in the face of global challenges. These farms, situated between small holdings and large agricultural corporations, face the need to optimize resources to remain competitive and sustainable. In this context, strategic planning plays a vital role, facilitating the identification of long-term objectives and the alignment of available resources with them.

An essential aspect of farm management is the optimization of the use of natural and human resources. Effective management of water, soil and human capital not only improves productivity but also contributes to environmental sustainability. At the same time, the integration of modern technologies in agricultural management is becoming more and more necessary. These technologies not only facilitate data monitoring and analysis but also streamline production processes.

Optimizing agricultural production processes is necessary to maximize yields and minimize costs. Thus, implementing innovative methods and adapting to market demands are essential for the success of medium-sized farms. In addition, performance monitoring and evaluation methods contribute to more efficient management, allowing farmers to adapt their strategies according to results and continuously improve activities.

Chapter V, entitled "Case studies and best practices in optimizing the management of medium-sized farms", presents concrete examples of the implementation of technologies, business models and marketing strategies, providing farmers and farm managers with a practical resource for optimizing their operations. In parallel, good practices derive from the positive experiences of other farms and are validated by their success in the specific context of average farms.

The presented case studies are relevant and can serve as a model for farmers interested in improving the performance and sustainability of their farming activity.

These examples provide valuable insights into how medium-sized farms have overcome challenges through innovative management strategies, thereby improving productivity, efficiency and sustainability.

The farms studied set their optimization objectives, went through the stages necessary to implement the chosen optimization system, and constantly monitored the results for the continuous improvement of the applied procedures.

The following were analyzed as solutions to optimize management in medium-sized agricultural farms: the implementation of an integrated management system; the implementation of a farm management information system (Farm Management Information System - FMIS); optimization of logistics and supply chain management in a farm; sustainable resource management; education and continuous training of farmers, as an element of sustainable management.

These analyses allowed the formulation of the conclusions in Chapter VI.

Optimizing the management of medium-sized farms in Romania is a complex process, but essential for ensuring sustainable and efficient agriculture. The implementation of an integrated management system, the optimization of agricultural production processes and the sustainable management of resources are key directions that can transform current challenges into opportunities for development. By adopting these strategies, farmers can contribute not only to increasing profitability but also to protecting the environment and developing rural communities. This represents an opportunity to build a more sustainable agricultural future, based on innovation, responsibility and respect for natural resources, thus ensuring not only the well-being of the present but also of future generations.