SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT VI

Book of Abstracts

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PLENARY SECTION

PREFACE

The Book of Abstracts is prepared as the result of the scientific research supported by the Ministry of Science, Technological Development and Innovations of the Republic of Serbia.

The Proceedings includes articles presented at the International Scientific Conference – Sustainable Agriculture and Rural Development - VI, which was held in Belgrade on December 11-12th, 2025.

In the Book of Abstracts are included abstracts from Serbia, along with the invited and other papers from abroad, prepared by foreign authors, which are IAE Belgrade associates, and whose institutions have close scientific, professional and technical cooperation with the IAE Belgrade.

The Book of Abstracts addresses the wider audience by being scientifically and practically focused on all segments of sustainable agriculture and rural development, but also biotechnology and digitalization in agriculture.

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BOOK OF ABSTRACTS

PLENARY SECTION

ECONOMIC MODELS OF SUSTAINABLE AGRICULTURE IN THE CONTEXT OF THE DIGITAL REVOLUTION

Marijana Joksimović[1]

Abstract

In the face of increasing demands for more efficient, environmentally sustainable, and socially responsible agricultural systems, sustainable agriculture has assumed a central role in rural development strategies. This paper investigates economic models that support sustainable agriculture, with a particular focus on the transformative impact of the digital revolution. It analyzes the potential applications of smart farming, precision technologies, and digital platforms as tools to enhance productivity, reduce costs, and improve the market competitiveness of agricultural holdings. The study also considers the role of public policies, investments in digital infrastructure, and farmer education in fostering the transition toward sustainable production models. It concludes that digital transformation can significantly improve the economic sustainability of agriculture; however, its full potential is contingent upon the level of digital literacy, access to technologies, and institutional support.

Key words: *Sustainable agriculture, economic models, digital transformation, agribusiness, rural development, smart farming.*

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TRADE OF MAIZE AND WHEAT IN BOSNIA AND HERZEGOVINA[1]

Danijela Kondić[2], Miroslav Nedeljković[3], Bojan Kresojević[4], Gvozden Mićić[5]

Abstract

Bosnia and Herzegovina (BIH) continues to exhibit a pronounced import orientation of maize and wheat. Despite possessing considerable agricultural potential, the country's domestic production is insufficient to meet national requirements, necessitating dependence on cereal imports. This study aims to examine the import and export dynamics of maize and wheat (soft and durum), including both mercantile and seed categories, in BIH over the period 2014–2023. The data were obtained from Trade Map and the FAOSTAT database. In the analysis of import and export data for mercantile and seed maize and wheat, linear regression equations with associated coefficients were used. The research seeks to identify long-term trends, quantify annual fluctuations, and assess the structural balance between domestic production and foreign trade. Overall, the analyses of maize and wheat trade in Bosnia and Herzegovina consistently indicate a strong structural dependence on imports to meet domestic demand, while exports play a marginal role across all examined cereal categories.

Key words: *Cereals, domestic production, export, import, trade balance, long-term trends.*

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RURAL TOURISM AND TERRITORIAL DEVELOPMENT: THE CASE OF GENERAL PUEYRREDON DISTRICT, ARGENTINA

Graciela Benseny[1]

Abstract

Rural tourism in Argentina has become a key strategy for economic diversification and restructuring in the face of depopulation, productive concentration, and the structural crisis of the agricultural sector. It represents a complementary alternative to traditional farming activities, promoting economic diversification and enhancing the value of local landscapes and heritage. The district of General Pueyrredon, characterized by its territorial diversity and the dominance of its main city, Mar del Plata, offers experiences that integrate production, nature, and culture. This study analyzes the role of rural tourism as a driver of sustainable development, capable of linking natural, cultural, and social heritage with new circuits of consumption and territorial production, while exploring its potential to strengthen local identities and generate sustainable territorial development strategies. A qualitative and territorial approach is applied to examine recent transformations, opportunities, and challenges in the consolidation of rural tourism. The results indicate that rural tourism in Argentina provides complementary income and redefines social, productive, and symbolic relationships, positioning itself as a viable alternative for territorial restructuring and socioeconomic resilience.

Key words: *Rural tourism, territory, local development, economic restructuring, tourist space.*

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APPLICATION OF GOOD PRACTICES TO ACHIEVE CLIMATE RESILIENCE IN AGRICULTURE

Divna Simić[1], Jelena Marković[2], Vera Popović[3], Vojin Cvijanović[4], Snežana Janković[5]

Abstract

In conditions of climate change adversely affecting yields and natural resources, the application of Good Agricultural Practice (GAP) becomes important to preserve production and adapt to new conditions. GAP involves planning, education, and optimal use of water, land, fertilizers, pesticides, and labor, thereby enabling safe food production, environmental conservation, and efficient resource management. In Serbia, a successful application of these practices requires systemic support through education and appropriate political framework. This approach leads to reduced use of chemicals, increased value of products and ecosystem protection, and as an integrated management model, it includes crop and livestock production, energy, waste, human health and social aspects. The aim of the paper is to highlight the role and importance of GAP in achieving stable and safe agricultural production, while preserving economic, social and ecological sustainability, as well as to contribute to the identification of measures for sustainable practices and resource conservation.

Key words: *Good agricultural practice, climate change, sustainability strategy.*

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THE LOSS OF CULTURE AND IDENTITY IN RURAL AREAS IN SPAIN FROM THE 19TH CENTURY

Bárbara Polo Martín[1]

Abstract

This paper explores the erosion of cultural and territorial identity in rural Spain during the 19th century, focusing on the transformative role of cartography and administrative reforms. Drawing on the legacy of Enlightenment rationalism and the influence of French cartographic models, it examines how the imposition of linear boundaries and standardized provincial divisions culminating in Javier de Burgos's 1833 territorial reform redefined Spain's spatial logic. These changes marginalized historically rich and symbolically distinct rural regions, such as León and Aragón, by subsuming them into homogenized administrative units. The study highlights how cartographic practices, far from being neutral, acted as ideological tools that silenced local identities and reshaped collective memory. Through the lens of Castilla y León, it illustrates the long-term consequences of this rationalist spatial order, including contemporary movements for regional autonomy and cultural reclamation. Ultimately, the paper advocates for a humanized geography that reconciles administrative efficiency with historical continuity and cultural pluralism.

Key words: *Cartographic rationalism, territorial identity, rural Spain, Enlightenment, cultural erasure.*

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EDUCATING ON COOPERATIVES: IMPORTANCE, CURRENT STATE, AND FUTURE PROSPECTS

Marija Nikolić[1]

Abstract

In a market-oriented environment, the cooperative sector is often unjustifiably neglected. This also applies to opportunities for acquiring knowledge about cooperatives, even though such knowledge is a prerequisite for active member participation and effective cooperative management. This paper examines the reasons behind the neglect of cooperative education and explores the possibilities for acquiring knowledge in this field in Serbia and selected countries with well-developed cooperative sectors. The analysis indicates that the current situation hinders the development of adequate skills and organizational capacities necessary to improve performance and enhance the impact of cooperative enterprises. Faculties, primarily with agricultural science, which are the main providers of cooperative education, have continuously marginalized this course in their curriculums in Serbia. In the absence of non-formal educational opportunities in the field of cooperatives, this important area remains neglected within the education system. Coordinated efforts by the state, the academic community, higher education institutions, and the cooperative sector are required to design and implement diverse educational programs in cooperative studies.

Key words: *Cooperatives, education, faculties, cooperative sector.*

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FUTURE OF AGRICULTURE AND ANIMAL PRODUCTION IN A CHANGING WORLD: CHALLENGES AND INNOVATIONS

Vesna Gantner[1], Boris Ljubojević[2], Dragan Dokić[3]

Abstract

This paper analyses the future of agriculture and animal production under the combined pressures of global population growth, demographic shifts, climate change, political instability, and decreasing availability of natural resources. Special emphasis is placed on the indispensable role of traditional animal production in providing high-quality protein, essential nutrients, and ecosystem services, including soil fertility, nutrient recycling, and landscape management. While emerging technologies such as precision livestock farming, cultured meat, and fermentation-based animal product substitutes offer potential pathways to reduce environmental impacts and enhance production efficiency, they cannot fully replace the biological, socio-economic, and cultural functions of conventional livestock systems. By reviewing demographic trends, environmental impacts, and technological innovations, this paper highlights the urgent need for sustainable, resilient, and scientifically guided strategies in animal production. Maintaining and improving traditional livestock farming is essential not only for food security but also for preserving rural economies, cultural heritage, and the overall stability of agricultural systems in both global and Balkan contexts.

Key words: *Animal production, sustainability, food security, precision livestock farming, lab-grown meat.*

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DIGITAL ANALYSIS OF EROSION RISKS USING THE SLIVOVI MODEL IN SIX SUB-BASINS OF THE SHIRINDAREH RIVER BASIN – SUPPORTING THE REVITALIZATION OF RURAL AREAS IN THE MOUNTAINOUS REGION OF IRAN

Velibor Spalević[1]

Abstract

This paper presents the application of the "River basins" model of Spalevic for digital analysis of erosion risks in six sub-basins of the Shirindareh River Basin in Iran. The research quantifies the intensity of erosion in order to support sustainable land and water management in rural mountainous areas. The results show significant differences: sediment production ranged from 13,235 m³/year (S1-1) to 53,821 m³/year (S1-2), while actual soil losses per km² varied from 194 to 364 m³/km²/year. Erosion coefficients (Z) ranged from 0.748 to 0.917, which places all basins in the second category of destruction with strong erosion processes, predominantly surface and gully erosion. The "Basins" model identifies critical zones and prioritizes protection measures. Such digital approaches are essential for the revitalization of rural areas and the mitigation of land degradation. Most importantly, detailed erosion vulnerability assessments are essential for decision-makers in planning effective land protection measures, integrated rural development and revitalization policies.

Key words: *Digital erosion modeling, River Basin model, Shirindareh basin, revitalization, land degradation, sustainable land use.*

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A ROMANIAN PERSPECTIVE ON UNDERSTANDING THE REGIONAL DISPARITIES AND CONVERGENCE IN EU AGRICULTURAL AND RURAL SECTOR IN CONTEXT OF THE NEW NORMAL PHILOSOPHY

Jean Vasile Andrei[1], *Mihalcea Viorel Mihai*[2], *Ionescu Madalina Laura*[3]

Abstract

Regional disparities in agricultural productivity and rural development continue to challenge the European Union's cohesion objectives, particularly in newer member states such as Romania. This study examines the patterns and determinants of regional disparities and convergence in EU agricultural and rural sectors, with a focus on Romania, in order to inform policy design and implementation. The primary objective of the research is to analyze and evaluate the evolution of potential regional disparities and convergence in the EU agricultural and rural sector from a Romanian viewpoint. The analysis identifies disparities between Romania and EU-27 countries, with lagging areas characterized by limited infrastructure, low-value agricultural production, and constrained access to finance and technical resources. The results highlight the role of policy interventions, including the Common Agricultural Policy (CAP), national rural development programs, and targeted regional investment strategies, in promoting convergence and reducing structural inequalities. Policy implications include the need for differentiated support tailored to regional characteristics, strengthened capacity-building in lagging areas, and mechanisms to facilitate technology adoption and market integration. The sustainable rural growth and equitable agricultural development require financial transfers and strategic planning that addresses structural

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constraints, fosters innovation, and aligns local capabilities with EU-level cohesion objectives.

Key words: *Regional disparities, agricultural productivity, rural development, labor force, inequalities.*

MICROBIAL CONVERSION OF NON-FOOD FEEDSTOCK INTO VALUE-ADDED BIOPRODUCTS

Bo Wu[1], Aleksandra Ivetić[2], Mingxiong He[3]

Abstract

Replacing food-based feedstocks with non-food alternatives is crucial for food security and the sustainable supply of raw materials for biomanufacturing. In this presentation, advanced technologies for microbial strain improvement are introduced. Then examples on the valorization of non-food biomass by engineered microbial strains are presented, including the development of integrated processing for ethanol-biogas-biofertilizer co-production, green biomanufacturing of lactic acid, and the levan production using sucrose-rich industrial wastewater.

Key words: *Non-food biomass, biomanufacturing, microbial strain improvement, metabolic engineering, synthetic biology.*

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ECONOMIC AND ECOLOGICAL BASIS IN REFORESTATION OF DEFORESTED AREAS IN SERBIA

Ljubinko Rakonjac[1], Vasilije Isajev[2], Aleksandar Lučić[3], Vladan Popović[4]

Abstract

Artificial establishment of forests afforestation, is a complex multidisciplinary activity of forestry profession which includes and synchronizes ecological, biological, organizational and economic activities. In afforestation projects, the primary stage refers to the selection of species according to the ecological differentiation of the area for afforestation, planning of its future purpose, and measuring and calculation of expenses for economically sustainable implementation of all works. Based on the exact data, available maps and surveys, by applying the method of forest typology all further activities at the level of potential forest vegetation are defined. Potential ecological-vegetational unit is defined according to these data in accordance with the criteria of typological classification. The selection of autochthonous species for afforestation is carried out for each ecological unit using as a base the dendroflora of potential vegetation on the specific habitat. In relation to the degree of degradation, three categories of species are recommended: a) main species (edifiers of potential natural vegetation) on preserved habitats; b) supporting species (pioneer species for given habitats) for partially degraded habitats; c) shrub species (ameliorative autochthonous shrubs) for advanced degradation stages, in which vegetation is partially or completely destroyed. Implementation plans, necessary economic assets and justification of their engagement in space and time differ depending on the degree of degradation of the area. The paper presents the results and economic justification of several decades of activities of scientific and professional staff of the Institute of Forestry in Belgrade on reforestation of different types and degrees of degradation of terrain in Serbia.

Key words: *Ecological and economic basis, afforestation/reforestation.*

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I SECTION: AGRIBUSINESS

AGRARIAN PROTECTIONISM AS AN INSTRUMENT FOR REVITALIZATION OF RURAL AREAS[1]

Jana Petrović[2], Miroslav Nedeljković[3], Velibor Potrebić[4]

Abstract

Agricultural protectionism serves as an essential policy strategy for preserving local agricultural output and fostering sustainable rural growth, especially in economies susceptible to market instability and international rivalry. Through price stabilization, assistance for small and medium-sized farms, and the encouragement of innovation, protectionist policies alleviate the negative impacts of trade liberalization and population decline. Experiences from Croatia, Slovenia, North Macedonia, Japan, Switzerland, and the United States show that effectively crafted protectionist policies can boost competitiveness, update production processes, and maintain rural traditions. In addition to its economic significance, agrarian protectionism aids in ecological conservation, promotes rural jobs, and invigorates local communities. With the growing integration of global markets, protectionist measures, when aligned with environmental and social goals and institutional transparency, act not as trade barriers, but as strategic tools for sustainable rural resilience and equitable territorial development.

Key words: *Agrarian protectionism, rural development, agricultural policy, sustainable agriculture.*

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RESILIENCY-ORIENTED AGRICULTURAL MODERNIZATION MODEL: THEORETICAL FOUNDATIONS AND PRACTICAL APPROACHES IN THE REPUBLIC OF MOLDOVA

Eugenia Lucasenco[1], Alexandru Ceban[2]

Abstract

The agricultural sector of the Republic of Moldova represents a keystone of the national economy, even if it faces substantial challenges connected to climate change, insufficient modernization, low productivity and underdeveloped sub-sectors. The pursuit of achieving a resilient sector has become an essential priority, necessitating theoretical insights and practical modernization strategies. The paper is aiming to analyze the theoretical foundations of resiliency-oriented agricultural modernization model and to present their practical applicability in the context of the domestic agricultural sector. It combines an in-depth review of the academic literature in the field with an analysis of the model's content. Findings present that diversification of sub-sectors and their revival, increasing competitiveness, as well as an enhanced public support can improve productivity and resilience of the sector. The results highlight that resiliency-oriented modernization should mix theoretical models with locally adapted practices, being supported by coherent governance and targeted support.

Key words: *Resilience, agricultural sector, modernization, Republic of Moldova.*

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ANALYSIS OF FARMS IN ROMANIA IN THE CONTEXT OF THE EUROPEAN UNION

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Abstract

The current state of the economy and society in the Romanian agricultural sector, as well as the development of rural space, are, to a large extent, influenced by the country's agrarian structure, which is deeply not adapted to the requirements of a modern agriculture, capable of ensuring food safety and security. This situation is mainly the result of the inefficient or defective application of land laws in Romania, which negatively affects productivity, land redistribution, and sustainable development of rural areas. The authors of the paper comparatively analyse the situation of agricultural farms in Romania in the context of the EU. The analysis highlights that the evolution and differences in the structure of farms in the EU vary from one country to another. In order to remedy these problems, a profound reform of the legislative framework and agricultural practices is necessary in Romania, oriented towards the consolidation of agricultural households and the implementation of policies that promote the sustainability and competitiveness of the Romanian agricultural sector.

Key words: *Evolution, small farms, polarization.*

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INNOVATIVE AGRICULTURE: THE PROFESSION OF TOMORROW[1]

Nedeljko Prdić[2], Sara Kostić[3], Boris Kuzman[4]

Abstract

The aim of this study is to determine the basic knowledge and computer literacy of vegetable producers in the Vojvodina region who engage in agricultural production as their primary occupation. The research was conducted at six markets in larger urban centers, with participants required to have at least ten years of production experience and to regard agriculture as their future profession. Based on a review of relevant literature in the fields of agriculture, distribution, and agricultural product marketing, a survey was carried out through face to face interviews comprising two thematic sections: the future of agricultural production and product distribution. Analysis of the responses from a sample of 60 producers revealed a low level of awareness of agriculture as a profession of the future, alongside a strong desire among respondents to continue their agricultural activities. Given the market insights, the adoption of technologies in agriculture, and respondents' positive attitudes toward innovations in production and distribution, there is a clear need to better inform producers about the role of technological advancements in agriculture. The findings provide concrete guidelines for future research on implementing new technologies, optimizing product distribution, and retaining young people in rural areas.

Key words: *Agricultural producers, innovative agriculture of the future, distribution and marketing.*

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CHANGES IN STUDENTS' FOOD PURCHASING BEHAVIOUR UNDER THE IMPACT OF PRICE INCREASES

Radivoj Prodanović[1], Nebojša Kojić[2], Dragan Ivanišević[3]

Abstract

In the context of a pronounced increase in food prices, the student population faces challenges in maintaining the quality of nutrition while optimising limited financial resources. The aim of the study was to identify changes in students' behaviour when purchasing food products during the recent period of significant price growth, using a questionnaire survey (n = 274). The results indicate that most students combine studies with employment, with the main sources of income being their salaries and family support. Students most frequently purchase dairy products, fruit, vegetables and cheese, while ready-made meals and fish are less represented in their shopping baskets. Food is mainly purchased in large supermarkets. Price is ranked as a highly important criterion when making purchasing decisions, immediately after taste and freshness. A large proportion of students reported that, due to rising prices, they had to reduce the frequency of purchases, choose cheaper alternatives, and pay more attention to discounts and promotions. The findings also suggest that students adapt to economic challenges through consumption rationalisation, demonstrating strong price sensitivity and a pragmatic approach to shopping. Behavioural changes include price monitoring, switching to lower-cost products, giving up certain food items, and devoting more attention to meal planning. Digital purchasing channels (online orders), although present, are not yet the dominant choice, possibly reflecting geographical and infrastructural constraints.

Key words: *Consumer behaviour, students, food products, prices.*

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EFFECTS OF CLIMATE CHANGE ON RASPBERRY PRODUCTIVITY IN WESTERN SERBIA[1]

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Abstract

This study analyzes the impact of climate change on raspberry productivity in Western Serbia during the period 2014-2023. Data from the Republic Hydrometeorological Service of Serbia, including average temperatures and precipitation amounts, were used, alongside regional raspberry yield data. The results indicate that annual averages of climatic parameters do not fully reflect the actual production conditions; instead, extreme weather events and the temporal distribution of precipitation and temperature during the growing season play a crucial role.

Key words: *Raspberry, climate change, productivity, extreme weather, adaptation.*

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LEGAL ASPECTS OF RESPONSIBILITY OF AGRICULTURAL COOPERATIVES IN THE REPUBLIC OF SERBIA[1]

Ljiljana Rajnović[2]

Abstract

In this paper, the author analyzes the responsibility of the agricultural cooperative for the obligations assumed in the legal transaction. Agricultural cooperatives, regardless of the form in which they were founded and with all the specifics arising from cooperative principles, uniform almost everywhere in the world, have a lucrative - commercial character. Like any other economic entity, cooperatives are obliged to operate economically and to be competitive on the market. Exceptionally, cooperatives that are closer to the form of an association, which is characterized by the principle of solidarity and reciprocity, do not have to have a specified target function, but they must have the function of reducing costs and saving for their cooperatives, which is sometimes present in business companies. Considering the obligation of socially responsible behavior of all business entities, the authors came to the conclusion that agricultural cooperatives must well define their goals and, in connection with that, their responsibility towards all internal and external interest groups in the territory where they operate and beyond.

Key words: *Agricultural cooperatives, the objective function of the cooperative, the responsibility of the cooperative, the responsibility of the cooperative members, joint and several liability, the responsibility of the property of the cooperative.*

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COMPARATIVE ANALYSIS OF THE REALIZATION OF SUSTAINABLE DEVELOPMENT GOALS RELATED TO FOOD AND AGRICULTURE

Lela Ristić [1], Petar Veselinović [2], Danijela Despotović [3]

Abstract

The achievement of sustainable development goals is very current at the global and national level, in all economic sectors, including the agri-food sector, with a focus on people, the planet and prosperity. Accordingly, the subject of research in this paper is the realization of the Sustainable Development Goals (SDGs) that directly or indirectly relate to food and agriculture. The aim of the research is to point out achievements and key challenges for the coming period in terms of implementing the SDGs. Based on the latest available data from the FAO (Food and Agriculture Organization of the United Nations), this paper conducts a comparative analysis of the implementation of the SDGs in the world, with a special emphasis on the Republic of Serbia. The research results show that the realization of these goals is nowhere at a high level, which means that much greater efforts and coordination are needed in the future than have been undertaken so far.

Key words: *Sustainable Development Goals (SDGs), agriculture, food, world, Republic of Serbia.*

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CLIMATE RISK DISCLOSURE AND INSURANCE PRACTICES AMONG SERBIAN CROP PRODUCTION COMPANIES

Marina Vasilić[1]

Abstract

This paper analyzes climate risk disclosure and insurance practices among Serbian crop producers, using data from their annual business reports and financial statements for the period 2021–2024. As one of the sectors most vulnerable to climate change, agriculture faces growing pressure to disclose and manage climate-related risks. However, corporate reporting in Serbia remains largely voluntary and descriptive, offering limited insight into how companies assess or mitigate such risks. The results show that only about one-fifth of analyzed firms mention climate change, typically without linking it to risk management or insurance. While most companies maintain some form of insurance, it is rarely recognized as part of a broader climate strategy. The findings reveal a gap between disclosure practices and actual risk management behavior, underscoring the importance of aligning future reporting with emerging international frameworks such as IFRS S2 to enhance transparency and climate resilience.

Key words: *Climate risk disclosure, insurance, agriculture, IFRS S2.*

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CIRCULAR FARMING MODEL

Ionuț Alexandru Condruz[1], Alexandra Elena Ciobanu[2], Ștefan Florin Unturică[3]

Abstract

A circular farming model is a regenerative agricultural approach that mimics natural ecosystems to minimize waste resource efficiency. The goal is to transition from a waste-generating agricultural system to one that recycles and reuses organic materials, nutrients, and water, thereby reducing the need for external inputs and lowering the environmental impact. Circular agriculture integrates practices that mimic natural ecosystems, where every element has a role in sustaining the system. Circular agriculture offers several environmental, economic, and social benefits that contribute to more sustainable food systems. Furthermore, its potential to mitigate climate change, combat food insecurity, underscoring its relevance in future agricultural practices.

Key words: *Circular farming, regenerative agriculture, environmental protection.*

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ANALYSIS OF FACTORS THAT INFLUENCE THE PURCHASE DECISION FOR THE PRODUCT/BRAND

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Abstract

Understanding the consumer decision-making process has become a major concern for both researchers and marketing practitioners in a modern economy, profoundly shaped by competition, technology, and constant changes in consumption behavior. The complex interactions between psychological, social, cultural, financial, and technological factors determine how consumers choose a product. Under these circumstances, the analysis of the purchasing decision becomes highly significant, as it is essential for anticipating and influencing consumer behavior in order to create effective and sustainable commercial strategies. From the awareness of a need and the search for information to the evaluation of alternatives, the final purchase decision, and post-purchase behavior - all these are components of the buying process. The consumer may act consciously or unconsciously, rationally or emotionally, in each of these stages. Consequently, research into the factors that influence buying behavior requires a deep understanding of attitudes, motivations, values, and the social context in which decisions are made, rather than merely tracking the choices themselves. The purpose of this paper is to present both a theoretical and practical approach to the purchasing decision, starting from fundamental concepts and culminating with a specific case study referring to a particular product or brand. Firstly, the well-known theoretical models of the consumer decision-making process are presented. Paper also discusses ways in which these models can be improved by incorporating modern trends such as digitalization, personalized offers, the influence of social media, and corporate social responsibility. In addition, the role that experience plays when people make purchasing de-

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cisions and become loyal customers is examined. Secondly, the elements influencing purchasing decisions are classified and analyzed in detail. These fall into three main categories: internal factors (personal, psychological, motivational), external factors (social, cultural, economic, technological), and product- or brand-specific factors (price, quality, packaging, design, brand awareness, etc.). The analysis is then applied to a specific case, such as a current market brand or product, to highlight how these factors manifest in reality and how they influence consumers' actual choices. Finaly, ther are examined how these elements affect marketing strategies. It explores how companies can adapt their marketing mix to align with consumer expectations and preferences, as well as positioning and differentiation strategies based on the target audience profile. Current trends are also analyzed, such as influencer marketing, the use of AI for personalized advertising, and the creation of automated promotion tools. Paper aims to emphasize how an in-depth understanding of the consumer enables companies to optimize their commercial efforts and build an authentic and lasting relationship with their audience. The purpose of this research is not only to achieve a theoretical understanding of the consumer decision-making process but also to demonstrate how crucial it is to understand buying behavior in the commercial strategies of brands. Consequently, the paper contributes to developing a modern and applied vision of marketing, consumer-oriented and grounded in research, adaptation, and innovation.

Key words: *Decision making, product purchase, brand purchase.*

ANALYSIS OF THE FACTORS THAT INFLUENCE THE PURCHASE DECISION IN THE CASE OF CHICKEN MEAT

Saian Nasri Nahar[1], Ioana Cristina Neagu[2], Alexandru Maryo Luis Boga[3]

Abstract

The present paper aims to analyze the determining factors that influence consumers' purchasing decisions in the case of chicken meat products, given their importance in daily nutrition and the dynamics of the agri-food market in Romania. The study starts from the identification of the main dimensions that affect purchasing behavior, such as price, perceived quality, food safety, brand, product origin, health aspects, and social or marketing influences. Based on quantitative research conducted through questionnaire, the perceptions and preferences of Romanian consumers are evaluated, aiming to highlight the current consumption trends and the major factors that influence the choice of mentioned product.

Key words: *Decision making, purchase, chicken meat, Romania.*

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ENSURING FOOD SECURITY UNDER CLIMATE, ECONOMIC AND GEOPOLITICAL INSTABILITY

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Abstract

This paper addresses the issue of food security, a topic of major importance in the current context marked by multiple overlapping crises, as are climatic, economic, and geopolitical. In increasingly unstable global environment, ensuring equitable access to food resources is not merely a development goal, but a fundamental component of national security and social stability. The relevance of this research is reinforced by current international strategies such as the 2030 Agenda for Sustainable Development, the European Green Deal, and the EU's Farm to Fork Strategy, where all of them recognize food security as a key priority. Furthermore, recent challenges, including post-pandemic effects, rising energy prices, and economic vulnerabilities, emphasize the urgency of the topic. The motivation behind this research lies in the aim to strengthen Romania's food security by identifying effective solutions and best practices that can reduce disparities with other European countries, while support long-term sustainable development.

Key words: *Food security, global unstability, sustainability, Romania.*

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FOOD SAFETY: TRENDS AND PERSPECTIVES

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Abstract

Food safety is a critical concern with direct implications for public health, economic stability, and quality of life. In today's globalized context, shaped by climate change and evolving consumer preferences, ensuring safe and high-quality food has become increasingly complex. Hazards may be physical, chemical, or biological, and unsafe food is a major contributor to illnesses and deaths worldwide, as reported by the World Health Organization. This paper examines current development and future directions in food safety. It explores key influencing factors, the role of European and international regulations, and the impact of technological advances such as digitalization and traceability. Additionally, it highlights the importance of consumer education in promoting responsible choices. The study offers an integrated view of challenges and solutions, underlining the need for continuous research to support a safer and more sustainable food system.

Key words: *Food safety, public health, EU regulation, digitalization.*

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FOOD SECURITY STATUS: COMPARATIVE ANALYSIS OF ROMANIA, BULGARIA, AND POLAND

Adelina Mihaela Ciobanu[1]

Abstract

This paper focuses on a comparative analysis of food security in three European Union member states: Romania, Bulgaria, and Poland. The main objective is to analyze and compare the evolution of food security across the mentioned three countries. The study is structured into three chapters. The first chapter presents the theoretical aspects of food security, including definitions, importance, key indicators, and a bibliometric analysis reflecting research interest in this topic. The second chapter use FAO data conduct a comparative evaluation of three countries across five categories of indicators: availability, access, stability, utilization, and additional relevant measures. The final chapter explores national strategies, social and economic conditions, and programs that contribute to improve in food security. The study concludes with a synthesis of similarities, differences, and recommendations for enhancing food security in Romania, Bulgaria, and Poland.

Key words: *Food security, Romania, Bulgaria, Poland.*

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MARKETING RESEARCH ON CONSUMER PREFERENCES FOR BREAD AND PASTRIES

Marian Alexandru Paica[1]

Abstract

This marketing research analyzes consumer preferences for bread and pastry products, in context of growing concerns about healthy eating and quality of the ingredients used. It was investigated the evolution of bakery market in Romania, highlighting consumer trends and preferences for artisan, wholemeal and additive-free products. It was also examined two representative companies in mentioned sector, analyzing their financial performances and strategy for adapting to market requirements. The performed study shows that consumers are increasingly interested in perceived healthier franzel products, motivated by desire to consume products with natural and health-promoting ingredients. Buying behaviour indicates that the most consumers purchase bread from supermarkets and specialized bakeries, focusing on freshness, quality and value for money. Certifications and clear labeling of the ingredients are considered important, while bakery products without preservatives and additives are perceived as having more positive impact on health compared to conventional ones.

Key words: *Bakery market, Romania, consumer's preferences.*

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SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES IN AGRICULTURE

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Abstract

This paper examines the sustainable management of natural resources in agriculture, focusing on the balance between productivity and environmental protection. Key practices such as crop diversification, soil conservation, efficient water use, and reduced chemical inputs are highlighted as strategies to preserve soil fertility and biodiversity. The study also considers innovative approaches, including precision agriculture and organic farming, which optimize resource efficiency while minimizing ecological impact. Furthermore, it emphasizes the importance of policy support, education, and farmer collaboration in achieving long-term sustainability. By integrating environmental, economic, and social dimensions, sustainable agriculture enhances resilience to climate change and contributes to global food security and rural development.

Key words: *Natural resources, agriculture, sustainability, management.*

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THE COMPETITIVENESS OF THE AGRI-FOOD SECTOR: A COMPARATIVE ANALYSIS BETWEEN ROMANIA AND SERBIA

Andreea Apetrei Kalveram[1], Mihai Dinu[2], Alina Florentina (Gavrilă) Gheorghe[3], Alexandra Marin[4], Maria Carina Grosu[5]

Abstract

The competitiveness of the agri-food sector is a key factor for food security, economic growth, and sustainable development, especially in emerging European economies. This paper compares the agri-food competitiveness of Romania and Serbia, two neighboring countries with similar historical, geographical, and cultural characteristics, but different institutional frameworks, i.e. Romania as an EU member state and Serbia as a candidate country. The study aims to identify strengths, weaknesses, and opportunities in their agri-food trade performance. Using international trade indicators, with emphasis on the Revealed Comparative Advantage (RCA) index, the analysis covers the main agri-food product categories during 2019-2023, based on the data from the Intracen platform. Results reveal sectors where Romania and Serbia hold competitive advantages, as well as areas of complementarity or direct competition. The paper provides insights into regional dynamics and highlights innovation, digitalization, and cooperation as strategic levers for strengthening long-term competitiveness and sustainability of the agri-food sector in both countries.

Key words: *Agri-food sector and trade, competitiveness, Romania, Serbia.*

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THE IMPORTANCE OF EDUCATION AND PUBLIC AWARENESS ON CONSUMER PROTECTION

Ana Nițu[1], Bulent Marin Gürler[2]

Abstract

The study "The Importance of Education and Public Awareness on Consumer Protection" investigates Romanian consumers' knowledge, perceptions, and behaviors regarding their rights and obligations. It examines the degree of trust in institutions and organizations responsible for consumer protection and the ways consumers react when their rights are violated. Using documentary research, analytical methods, and a questionnaire-based survey, the paper evaluates the level of awareness, while identifies gaps in consumer education. Results support the hypothesis that consumer awareness is generally low, limiting the effectiveness of legal frameworks and institutional actions. The findings emphasize that improving consumer education is essential for ensuring rights protection and fostering a well-functioning market.

Key words: *Education, awareness, market, Romania, consumer protection.*

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IMPROVEMENT OF WHEAT PRODUCTION FOR THE GOAL OF ECONOMIC DEVELOPMENT OF AGRICULTURE AND VILLAGES

Violeta Babić[1], Vera Rajičić[2], Dragan Terzić[3], Aleksandar Radović[4]

Abstract

To achieve high and stable yields of wheat, as well as good grain quality, a careful selection of varieties in accordance with climatic conditions and the application of appropriate agricultural techniques is necessary. The average yields of wheat for the last 10 years in the main production areas of Serbia range from 4.5-8.0 t/ha. Wheat production in Serbia largely depends on external environmental factors. The average yields of winter wheat grains in our country and the fertility potential of cultivated varieties differ significantly, especially in the hilly and mountainous regions of Serbia. Successful and stable wheat production requires the synergy of a high-yielding variety, optimal agroecological conditions, the application of modern agrotechnical measures and crop protection. A high and stable yield must be economically justified, which, with respect for varietal agricultural techniques and with favorable agro-climatic conditions, can be achieved. Increasing yields and improving the quality of production contributes to the economic development of agriculture and villages, bearing in mind the dependence on market price movements.

Key words: *Wheat production, agroclimatic conditions, agrotechnics, yields, prices.*

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COMPETITIVENESS OF APPLES FROM THE REPUBLIC OF SERBIA ON THE INTERNATIONAL MARKET

Srđan Đurasović[1]

Abstract

In the fruit production of the Republic of Serbia, the production of pome fruits holds the leading position, with Serbia being a leading producer in the region, and in some varieties even on a European scale. This paper analyzes the production, export, import, and foreign trade exchange of pome fruits of the Republic of Serbia in the period 2019-2023, with an emphasis on competitiveness in the international market. The average production of pome fruits amounted to 541,576 tons, with a declining trend at an annual rate of 6.17%, while exports averaged 176,910 tons with a decline of 11.60% annually. Imports averaged 32,023 tons with a declining trend of 8.51% annually, which means Serbia achieves a positive balance in foreign trade exchange of pome fruits in an average amount of 145 thousand tons. About 32.67% of the average production reaches export, which shows that the largest part of production is intended for domestic consumption. Export is inseparably linked to production capacities and their structure, as well as the ability to adapt to the specific requirements of the international market. The apple dominates in the export of fresh fruit due to favorable production conditions in Serbia and the possibility of storage throughout the entire year. Differences in export and world prices show that pome fruits from Serbia have a price advantage in the international market, but to ensure a stable competitive position, it is necessary to upgrade factors such as quality, standards, and product recognition.

Key words: *Pome fruit, production, competitiveness, export, import, Republic of Serbia.*

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AGRICULTURE BETWEEN SUSTAINABILITY AND ENVIRONMENTAL PRESSURE: AN EMPIRICAL ANALYSIS IN WESTERN BALKAN COUNTRIES

Marija Petrović Ranđelović[1], Tatjana Stevanović[2], Snežana Radukić[3], Žarko Popović[4]

Abstract

The purpose of this paper is to empirically examine the impact of agriculture and selected sectoral and macroeconomic factors on the ecological footprint of the Western Balkan countries using panel data from 2001 to 2023. The research assumes that the structural characteristics of the economies of the countries of the region, especially the agriculture, industry and energy sectors, play a key role in shaping the model of ecological sustainability. The empirical model, based on the panel regression approach (fixed effects model), enabled the examination of both short-term and long-term effects of the determinants of the ecological footprint. The results indicate that the growth of industrial activity and intensive food production significantly contribute to increasing the ecological footprint, while greater consumption of renewable energy has the opposite effect, reducing the pressure on natural resources. Agriculture has a statistically significant negative impact on the ecological footprint, which confirms that the sustainable development of the agricultural sector can contribute to reducing the pressure on natural resources. The findings of the research provide an empirical basis for the formulation of sustainable development policies in the field of agriculture, energy and urban planning, with the aim of reducing the ecological footprint and improving the economic resilience of the region.

Key words: *Ecological footprint, agriculture, sustainable development, Western Balkans.*

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MONEY LAUNDERING IN THE AGRICULTURAL SECTOR

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Abstract

The agricultural sector represents an important component of the national economy in many countries and, due to its structural characteristics, high proportion of cash transactions, and relatively weak control over the flow of goods and finances, is often considered a suitable channel for the concealment of illicitly acquired funds. Money laundering through agriculture has been documented in several countries, particularly in those with high levels of state subsidies or insufficient regulatory oversight. Within the European Union, several cases have revealed the direct involvement of organized crime in the misuse of budgetary incentives and, consequently, in money-laundering activities. In Serbia, this risk has been increasing year by year. The subject of this paper is therefore the analysis of typological characteristics and various modalities of money laundering within the agricultural sector. In addition to examining and assessing the degree of exposure to this risk in Serbia, the paper will also provide recommendations for its mitigation.

Key words: *Agriculture, money laundering, tax evasion, subsidies, Financial Action Task Force (FATF).*

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THE IMPORTANCE OF INSURANCE IN AGRICULTURE

Mirjana Dejanović[1]

Abstract

Climate change is one of the biggest challenges facing modern agriculture, causing more frequent and severe weather events that directly threaten crop yields and overall production stability. In addition to these climate risks, farmers are facing with volatile markets, fluctuating prices, and other economic uncertainties, which together increase the financial vulnerability of agricultural production. This paper argues that the integration of agricultural insurance with modern technologies has the potential to significantly improve the resilience and stability of the farming sector, particularly for small and medium-sized producers. The research examines various agricultural insurance models, the barriers farmers facing in accessing them, and the role of digital tools in improvement the efficiency and effectiveness of insurance systems. It also highlights key issues such as high insurance premiums, limited farmer education and awareness, and complex administrative procedures. By analysing successful international examples, the paper proposes solutions suitable for implementation in Serbia. The study concludes that combining technological innovations with well-designed insurance mechanisms can reduce risks, improve accessibility, and support sustainable agricultural development.

Key words: *Climate change, agricultural insurance, modern technologies, risk management. sustainability.*

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DEVELOPMENT OF A CEREAL SUPPLY MODEL IN THE REPUBLIC OF CROATIA USING THE ARIMA APPROACH I

Dragan Dokić[1], *Vesna Gantner*[2]

Abstract

Cereal production represents a strategic sector of the Croatian economy, for which the country is recognized in the international market. Due to extensive arable land and high-quality soils, crop yields per unit area are above average. The objective of this study was to analyse historical cereal production and forecast future supply using the Autoregressive Integrated Moving Average (ARIMA) model. Time series for the period 2018–2023 were examined, and statistical and econometric analyses were applied to identify variations and deviations within the data. Based on these analyses, projections for the six-year period 2024–2029 were generated. The results indicated expected positive trends in the supply of wheat, maize, barley, and oats, providing valuable insights for planning and optimizing cereal production in Croatia.

Key words: *Crop production, regressive supply, price, ARIMA model.*

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MODELING PROFITABILITY AND RISK IN WHEAT PRODUCTION: A MONTE CARLO APPROACH[1]

Saša Todorović[2], Sanjin Ivanović[3]

Abstract

Having in mind an importance of wheat production for Serbian agriculture, it is necessary to explore its level of riskiness and profitability. The goal of this research was to discuss these topics based on data describing variability of key influential components, such as market price and yield of wheat. Based on relevant statistical data for Province of Vojvodina (covering period from 2010 to 2024) log-normal distribution was applied to model wheat price and yield changes. Monte Carlo simulation was performed to determine profitability and risk in wheat production. It was concluded that expected median profit and mean profit in wheat production have negative values. The risk in wheat production proves to be very high, i.e., there is 96.8% probability of achieving negative outcome (producers would suffer losses). The result proved that Monte Carlo simulation performed well, although actual loss was smaller than loss estimated by the simulation.

Key words: *Wheat production, profit, risk, log-normal distribution, Monte Carlo simulation.*

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ECONOMIC EFFECTS OF AGRICULTURAL COOPERATIVE'S MECHANISATION USE IN PRODUCTION ACTIVITIES AT THE FAMILY AGRICULTURAL HOLDING[1]

Jelena Nestorov Bizonj[2], Jonel Subić[3], Marko Jeločnik[4], Darko Gavrilović[5]

Abstract

For the majority of family agricultural holdings (FAH) is characteristic the high share of costs of using their own agricultural mechanization in overall production costs, as well as its low technical and excessive time utilization, resulting the high products' cost price. Aiming to reduce the share of costs of using the FAH's own mechanization within the total costs of production, as to promote the use of modern mechanization of the agricultural cooperative (AC), there are performed the analysis of economic effects of AC's mechanization use in production activities at FAH. The analysis has been focused on four lines of crop production (wheat, corn, sunflower, and soybean) organized at the FAH on 13.4 ha and at the AC on 2,800 ha of utilized agricultural area (UAA). Analysis involves analytical calculations by production lines, then differential calculations due to different way of mechanization use by FAH, as well as an assessment of the economic effectiveness of investment in mechanization. According to gained results (in line to all economic indicators), for FAH which disposes with 13.40 ha of UAA it is more profitable to use the services of mechanization provided by AC than to invest in purchasing of its own mechanization (tractor + combine harvester ≥ 350,000 EUR).

Key words: *Family agricultural holding, agricultural cooperative, investment, mechanization, economic effects*.

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MANAGING THE AGRICULTURAL HOLDINGS IN THE REPUBLIC OF SERBIA: TRENDS IN GENDER EQUALITY[1]

Lana Nastić[2], Marijana Jovanović Todorović[3], Velibor Potrebić[4]

Abstract

Managing the agricultural holdings is performing by managers, who are in the Republic of Serbia mainly the holders of agricultural holdings, while they are predominantly male. In the research, the trend in number of agricultural farms in the Republic of Serbia was monitored, where the special attention was paid to the importance of women in the farm management. The aim of this work is to analyze precisely the participation of women in managing the agricultural holdings, as well as to determine the tendencies regarding the age structure of women managers, their overall number and utilized agricultural land area they are managing. Research found that during the observed period 2012-2023, there was a positive shift regarding to the overall number of female managers, while a negative trend was visible in terms of their age structure. It was also determined that during the entire observed period, women managers primarily run small agricultural holdings.

Key words: *Agricultural holdings, managers, gender equality, Serbia.*

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THE IMPACT OF GLOBAL CRISES ON FOOD PRODUCTION AND PRICES WORLDWIDE[1]

Suzana Balaban[2], Dejan Živkov[3], Anton Puškarić[4]

Abstract

Since late 2021, the world has been experiencing the fastest increase in food prices in the past fifty years. Numerous studies indicate that price dynamics and productivity trends often diverge, resulting in a negative relationship between them. Among the many influencing factors, two major global events have had a particularly strong impact on food markets and stock levels, with far-reaching consequences for production and international trade:

- *the COVID-19 pandemic, and*
- *the war in Ukraine.*

The pandemic introduced a high level of uncertainty regarding overall food production and international trade flows. Countries around the world implemented restrictive measures including travel limitations, border controls, and quarantines which severely disrupted food supply chains. In 2021, the meat production and processing sector faced significant difficulties: obstacles in procuring feed, restrictions on animal transport, reduced access to labor and professional services, and disruptions in the supply of meat and meat products. Prices fluctuated due to shifts in supply and demand: panic buying at the beginning of the pandemic increased demand, while reduced consumption in the hospitality sector shifted preferences toward meats more commonly consumed at home (poultry and pork), and away from beef and lamb. When it comes to cereals, the price of rice increased early in 2020, only to decline after the global economic slowdown and the lifting of export bans. As the world economy

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recovered, rice prices returned to pre-pandemic levels, reflecting expectations of good harvests and stable production. In contrast, prices of wheat, corn, and soybeans initially fell in the first half of 2020, then rose sharply in the second half of the year. The recovery of demand particularly from China played a crucial role, while wheat prices were additionally driven up by poor harvests caused by droughts in the United States, Canada, the European Union, Turkey, and Iran. The upward trend in corn and soybean prices slowed in the second half of 2021, when forecasts indicated record production in the United States and Brazil. Overall, strong global demand was the key driver behind rising international agricultural prices, despite disruptions within supply chains.

Key words: *Food, prices, crises, COVID-19 pandemic.*

AQUACULTURE EXPANSION IN THE CONTEXT OF FOOD SECURITY: POLICY INSIGHTS FROM SERBIA, ROMANIA, EU, AND GLOBAL TRENDS

Ioana Mihaela Balan[1], Teodor Ioan Trasca[2], Jeni Veronica Tiu[3], Gina Fintineru[4], Gheorghe Adrian Firu Negoescu[5]

Abstract

Globally, aquaculture has become the main source of aquatic products, taking over the growth of global demand and reducing the pressure on capture fisheries, which have been stagnating globally for over three decades. The rapid growth of aquaculture is essential for achieving the goals of the 2030 Agenda, in particular SDG 2: Zero Hunger and SDG 14: Life Below Water, in the context of overexploitation of wild stocks. Analysis of data for Serbia, Romania, EU, and the global level shows the same direction: increasing dependence on aquaculture and decreasing wild catches. Serbia shows variations in production and a continuous decline in capture fisheries, while Romania maintains stable aquaculture, while fishing has decreased sharply in the last decade. In the EU, the decline in catches is constant. These trends highlight the need for public policies that support sustainable aquaculture as a key element of food resilience and the protection of aquatic resources.

Key words: *Aquaculture, capture fisheries, food security, Agenda 2030, sustainable resource management.*

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STUDY ON THE ECONOMIC BENEFITS BROUGHT BY LOCAL GASTRONOMIC POINTS: TIMIȘ COUNTY

Monica Ocnean[1]

Abstract

Local Gastronomic Points (LGPs) are an emerging form of gastronomic entrepreneurship in Romania. This paper explores their economic impact in Timiș County, highlighting income diversification for rural households, increased demand for local agricultural products, stimulation of short supply chains, and positive effects on tourism. The research uses qualitative interviews, structured surveys, statistical analysis, economic modeling, and field observations. Challenges with certification, workforce skills, seasonality, and marketing practices are also discussed. Gastronomic tourism has gained momentum globally, with an increasing number of travelers seeking authentic culinary experiences. In Romania, Local Gastronomic Points represent a regulatory innovation that enables small producers to legally host visitors and serve local dishes using their own agricultural products.

Key words: *Local Gastronomic Points (LGPs), gastronomic tourism, small producers, agricultural products.*

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II SECTION: BIOTECHNOLOGY

HETEROSIS FOR SEED YIELD AND YIELD-RELATED TRAITS IN SUNFLOWER (HELIANTHUS ANNUUS L.)

Georgi Georgiev[1], Galin Georgiev[2], Nina Nenova[3], Atanas Atanasov[4]

Abstract

Getting benefit from use of heterosis is the main purpose in sunflower hybrid breeding. The objectives of this study were to determine performance of sunflower varieties and to measure the vigor of sunflower hybrids. In 2022 and 2023, sunflower hybrids were evaluated for four important yield components, yield performance, standard and regular heterosis, and heterobeltiosis, in Dobroudzha Agricultural Institute- Bulgaria conditions. Based on observations in this research, seed yield of hybrids. Sunflower is one of the main agricultural crops grown in Bulgaria. Due to rapidly changing climatic conditions (drought, attack by diseases and enemies, etc.), it is necessary to study the structural components treated with different doses of organic fertilizers related to an increase in seed yield. In sunflower, seed yield and oil content are complex characteristics that are influenced by different factors that may act individually or collectively. The study of a complex of traits is a crucial approach to increase seed yield. The effectiveness of selection depends mainly on the direction and magnitude of the relationship between yields and its components. Some of the indicators related to the yield significantly affect the yield and the direct effect has a different influence. Therefore, it is necessary to study which of the signs have a greater influence than others.

Key words: *Vegetation, sunflower, yeld, plant height, head diameter, heterosis.*

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ENVIRONMENTAL PERFORMANCE OF AGRICULTURE IN THE WESTERN BALKAN COUNTRIES[1]

Bojana Bekić Šarić[2], Vesna Paraušić[3], Snežana Tanasković[4], Anka Tara Stanković[5]

Abstract

Unsustainable agricultural practices cause significant ecological harm, contributing to climate change and biodiversity loss. This paper aims to monitor progress the environmental performance of agriculture in five Western Balkan countries, identifying similarities and differences among them. The analysis is based on values from the Environmental Performance Index, published by the Yale Center for Environmental Law and Policy, using data for 2020, 2022, and 2024. Across the three years analyzed, Serbia consistently ranked highest in environmental performance of agriculture, while Montenegro (2020; 2024) and Bosnia and Herzegovina (2022) ranked lowest. Overall, across the analyzed countries, achieving greater sustainability in agriculture requires agro-ecological and climate measures to be prioritized within agricultural policies, underpinned by fundamental alignment with the European Union Common Agricultural Policy 2023-2027.

Key words: *Western Balkan, ecological indicators, Environmental Performance Index, Agriculture.*

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REGIONAL DYNAMICS OF ORGANIC AGRICULTURE: INSIGHTS FROM SERBIA, HUNGARY, SLOVENIA, AND ALBANIA

Larisa Jovanović[1], Aleksandra Stojkov Pavlović[2]

Abstract

Organic agriculture is increasingly recognized as a strategic response to environmental degradation, public health concerns, and the demand for sustainable food systems. Its potential extends beyond ecological benefits, offering opportunities for rural development, value-added production, and niche market access. This study explores the structural and institutional dynamics of organic agriculture in Serbia, Hungary, Slovenia, and Albania. Through comparative analysis, it examines key indicators such as production growth, certification infrastructure, legislative alignment, and market orientation. A custom analytical framework—Comparative Development Capacity—was applied to assess each country's readiness to expand its organic sector. The findings reveal diverse trajectories shaped by EU integration, regulatory maturity, and export potential, highlighting both environmental and economic relevance for future policy development.

Key words: *Organic agriculture, Development capacity, Serbia, Hungary, Slovenia, Albania.*

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THE EFFECT OF CHROMIUM SUPPLEMENTATION IN DIETS OF FATTENING BEEF

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Abstract

The present study aimed to evaluate the influence of different dietary chromium levels on growth performance and feed efficiency in feedlot cattle. The experiment was conducted on a commercial fattening unit located near Kruševac, Serbia, over a 28-day experimental period. A Latin square design with repeated measurements was employed using calves uniform in age and initial body weight. The animals were housed in a semi-open facility and individually fed to ensure accurate feed intake recording. Body weights were measured at seven-day intervals, while daily feed consumption was recorded throughout the trial. Variations in body weight and average daily gain among calves receiving diets with different chromium inclusions were not statistically significant ($p>0.05$). Conversely, the effect of the experimental period had a highly significant impact on the evaluated parameters ($p<0.05$; $p<0.01$; $p<0.001$). The feed conversion ratio recorded during the experimental period ranged from 3.5 to 4.6 kg/kg gain.

Key words: *Chromium, calves, body weight, gain, feed.*

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AGRICULTURAL GREENHOUSE GAS EMISSION IN ROMANIA AND SERBIA

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Abstract

This study examines greenhouse gas emissions from agriculture in Romania and Serbia during the period 2012-2022, using FAOSTAT data. The analysis focuses on two main sources: crops and livestock. The results show the overall evolution of GHGs emissions, their distribution by source, and the differences between the two countries. Graphs and tables provide a clear picture of how each component of agriculture contributes to total GHGs emission. The study highlights both similarities and specific features of the emission profiles, contributing to a better understanding of the sustainability challenges facing agriculture in the region.

Key words: *GHGs emission, agriculture, Romania, Serbia.*

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INTEGRATING TRADITIONAL AGRICULTURAL KNOWLEDGE INTO AGROECOLOGY: A THEORETICAL AND QUALITATIVE STUDY ON SUSTAINABLE FARMING PRACTICES

Elena Cristina Butica[1], *Alexandra Mîț*[2]

Abstract

This study explores how traditional farming knowledge can be effectively integrated into modern agroecological systems to promote sustainability and resilience. In the context of global challenges such as climate change, rural depopulation, and increasing food demand, agroecology serves as a framework that connects agricultural heritage with technological innovation. The research combines theoretical analysis with qualitative data collected through questionnaires and interviews with practicing farmers. The findings reveal that integrating traditional practices with agroecological principles enhances soil fertility, biodiversity, and climate resilience while improving product quality and reducing dependence on chemical inputs. Moreover, the study highlights the role of community participation and local knowledge in achieving sustainable agricultural transitions. The paper concludes that agroecological, or traditional integration represents a viable pathway toward long-term agricultural sustainability, requiring support through public policies, participatory governance and education.

Key words: *Agroecology, sustainable farming, local knowledge.*

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ORGANIC AGRICULTURE IN ROMANIA, EUROPEAN UNION, AND SERBIA: TRENDS AND BENEFITS (2019-2023)

Iustin Florentin Tanu[1], Alexandra Marin[2], Alina Florentina (Gavrilă) Gheorghe[3]

Abstract

This paper analyzes the development of organic agriculture in Romania, the European Union, and Serbia during the period 2019-2023. It highlights the main benefits of organic farming, such as environmental protection, improved products' quality, and support for sustainable rural development. The comparative analysis shows that during this period, the EU has continued expanding organic farmland under the "Farm to Fork" strategy, while Romania and Serbia have been developed their organic sectors at different paces and under varying conditions. The findings emphasize the importance of public support and regional cooperation in promoting sustainable agriculture.

Key words: *Organic agriculture, Romania, EU, Serbia, regional cooperation.*

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THE GREEN BANK: EARNING INCOME FROM STORING CARBON IN SOIL

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Abstract

Carbon farming is an agricultural practice that stores carbon in soil to reduce greenhouse gas emissions and improve soil health. It benefits farmers by increasing soil fertility, reducing the need for chemical inputs, and improving water retention, all of which lower costs and increase crop yields. Additionally, farmers can earn income by selling carbon credits in voluntary markets, adding a new revenue stream. This approach also supports biodiversity and job creation in rural areas. Although initial investments and monitoring are required, carbon farming offers long-term economic and environmental advantages, promoting sustainable agriculture, and contributing to climate change mitigation efforts.

Key words: *Carbon farming, GHGs, soil health, Green bank, sustainability.*

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EVALUATING CARBON DIOXIDE EMISSIONS AND ENVIRONMENTAL IMPACT OF EUROPEAN AGRICULTURE

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Abstract

This paper presents a comprehensive analysis of carbon dioxide (CO_2) emissions from motor vehicles in Europe, tracking their evolution, drivers and policy implications for road transport. The main objective is to identify recent trends in CO_2 emissions from the automotive sector and to assess the contribution of technological (engine efficiency, fleet electrification), economic (fleet structure, average mileage) and regulatory (emission standards, incentives for electric vehicles) factors to emissions reductions. The methodology combines quantitative analysis of official emissions and registration databases, statistical-econometric analysis to identify causal relationships and simulation scenarios to project medium-term developments. The results show that the technological transition of the fleet and strict regulatory policies are the main drivers of the reduction in vehicle emission intensity, while the growth of the fleet and continued mobility can partially offset these gains.

Key words: *Carbon dioxide emissions, automobiles, Europe, environmental policies, road transport.*

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SUSTAINABLE AND GREEN STRATEGIES FOR ENHANCING THE RESILIENCE OF AGRICULTURE

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Maria Loredana Popescur[3], Madalina Ioana Moncea[4]

Abstract

In the context of intensifying climate change and increasing demographic pressure on cities, identifying and implementing green solutions is a priority for strengthening the resilience and sustainability of urban environments. This study explores the ways in which green infrastructure – such as green spaces, green roofs and facades, green corridors and sustainable rainwater management systems – contribute to improving the quality of urban life, reducing the heat island effect and increasing the capacity of cities to respond to climate and socio-economic shocks. It also analyses integrated sustainable urban planning strategies, public policies and financial instruments aimed at the transition to green and smart cities. The results highlight the importance of inter-sectoral collaboration, technological innovation and the involvement of local communities in the implementation of green solutions, underlining their role in creating resilient, energy-efficient and environmentally friendly urban ecosystems.

Key words: *Green solutions, urban resilience, sustainability, green infrastructure, sustainable development, smart cities.*

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RYE ECONOMICAL PRODUCTION AND THE POSSIBILITY OF USING STRAW IN ORDER TO PROTECT THE ENVIRONMENT[1]

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Abstract

Rye is, after wheat, the second most important bread grain, which is grown in a significantly smaller geographical area in conditions of a colder continental climate. In the total aboveground biomass yield, rye straw accounts for about 50%, although older varieties had a larger share compared to grain. The United States Department of Agriculture reports that the total amount of rye produced worldwide in the 2023–2024 season is 11.71 million tonnes, of which about 7.63 million tonnes are produced by EU nations. An estimated 2.50 million tonnes of this grain were harvested in Poland, the world's second-largest producer. About 40% of rye grain is used for consumption in EU nations, and about 35% is used for feed. About 20% of the rye grain produced in the EU is used as a raw material in several sectors, with over half of that amount being converted into biofuel (bioethanol). The paper analyzes ways of using rye straw from the aspect of environmental protection. The results showed that rye straw can be used as bedding for domestic animals and as coarse animal feed, if it is previously chopped and treated with chemical compounds to increase its digestibility. Due to the length and strength of the stems, which depends on the method of harvesting, rye

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straw is the most suitable raw material for the production of the finest paper and as an alternative building material. In construction, straw is used to covering residential buildings (eco houses), but also for the production of panel boards that are used to cover walls for thermal insulation. In the chemical industry, rye straw is used as a raw material for obtaining lignin, organic acids and furfural. Certain types of mushrooms grow best on a substrate made from rye straw, for example, shiitake, oyster mushrooms, and so on. Straw is also suitable for covering (mulching) the inter-row space in wide-row crops, for example potatoes, cucurbits, in orchards and vineyards. In the food industry, whole straw is used as a substrate, and ground as a wrapper for special types of full-fat hard cheeses during the ripening process. People with more artistic talent created numerous art objects from rye straw. Due to the strength and flexibility of the stems, rye straw is most often used in home crafts for weaving various containers, baskets, hats, asuras, and children's toys. Recently, rye has also been increasingly used in the energy sector to produce biogas.

Key words: *Rye production, straw, environment, energy sector, chemical industry and construction.*

POTENTIAL OF EXPERIMENTAL HOT PEPPER HYBRIDS FOR NUTRITIONAL FRUIT QUALITY

Biljana Šević[1], Dejan Cvikić[2], Marija Bajagić[3], Gorica Cvijanović[4], Milan Ugrinović[5]

Abstract

The research is aimed at evaluating the experimental hybrids of hot pepper (Capsicum annuum L.) obtained by crossing the male sterile line HM5 with pure lines (LDC4, LDC5, LDC6), with a focus on the content of dry matter and total soluble matter in the fruits (long pointed pepper type) in protected space conditions. The experiment was conducted in the period 2022-2025. in the Institute for Vegetable Crops Smederevska Palanka and placed according to a random block system in three repetitions, with 40 plants per repetition. Fruits were harvested at technological maturity. Hybrids showed significant variations: HM5xLDC6 stood out with 8.87% dry matter and 7.37 Brix, while HM5xLDC4 and HM5xLDC5 had lower values (7.13% and about 7-8% dry matter; 5.70-6.17 Brix). The results show a strong positive correlation between dry matter and total soluble matter ($r=0.83^{**}$), which contributes to the improvement of nutritional quality. The research identifies desirable combinations for the selection of hot hybrids adapted to the production conditions of the Republic of Serbia and support for sustainable production.

Key words: *Pepper, hybridization, dry matter content, total soluble matter.*

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BENEFITS OF CONTAINER SEEDLINGS ON PRODUCTIVE TRAITS OF DIFFERENT SWEET CORN HYBRIDS

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Abstract

During 2024, in a greenhouse on a family farm in Bogojevac (southern Serbia, 225 m above sea level), the influence of two methods of production - direct sowing and container production of seedlings on kernel depth and cob mass in the supersweet sweet corn hybrid DSST 255 and Sweet Nugget - was investigated. The establishment of the experiment was carried out on May 18, the harvesting of sugarcane produced by container production was carried out on June 30, and by direct sowing on July 10. The results show that container production yields significantly greater kernel depth in both hybrids (Sweet Nugget 1.10 cm; DSST 255 1.14 cm) compared to direct sowing (0.94 cm and 1.03 cm, respectively). The cob mass was higher in container production (Sweet Nugget 135.50 g; DSST 255 160.10 g) than in direct sowing (116.60 g and 121.80 g, respectively), with a statistically significant hybrid × production method interaction. The research provides an insight into the possibility of sugar beet production by container production of seedlings in order to increase quality and yield.

Key words: *Sweet corn, container production, direct sowing, kernel depth, cob mass, greenhouse production.*

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SUSTAINABLE USE OF TREATED WASTEWATER IN AGRICULTURE: CHALLENGES AND OPPORTUNITIES IN SERBIA

Milica Radojković[1], Milena Rikalović[2]

Abstrakt

The paper aims to provide an overview of sustainable management strategies and technologies that can enable safe and efficient wastewater utilization in rural agriculture, supporting the broader goals of sustainable development. Treated wastewater represents a valuable yet underutilized resource in sustainable agriculture, particularly in rural areas where water scarcity and climate change increasingly threaten productivity. This paper explores the potential for integrating treated wastewater reuse into agricultural systems in order to conserve freshwater resources, to improve soil fertility, and to promote circular economy principles. Present study highlights the environmental and socio-economic benefits of wastewater reuse - reduced pollution, enhanced resilience, and cost-effective irrigation. Also, it addresses the key challenges associated with the adoption of this practice, such as public perception, health risks, and the need for improved monitoring and policy frameworks.

Key words: *Treated wastewater, sustainable agriculture, rural development, water reuse, circular economy, environmental management.*

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AGRICULTURE AND TRANSPORT AS STRATEGIC DIRECTIONS FOR REDUCING THE CARBON FOOTPRINT AND ACHIEVING CLIMATE NEUTRALITY

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Abstract

Climate change represents one of the most pressing challenges of the 21st century. A radical overhaul of production and mobility systems is required. Agriculture and transportation are two pivotal sectors in this transition. It is evident that both sectors currently contribute significantly to greenhouse gas emissions, but they also have the potential to substantially reduce them. This paper examines their strategic role in achieving climate neutrality by adopting sustainable practices, integrating renewable energy sources and embracing technological innovation. In the context of agriculture, the adoption of precision farming methodologies, regenerative agricultural practices, and the utilisation of renewable resources such as solar and bioenergy have been demonstrated to be effective strategies for reducing the carbon footprint. In the transport sector, key decarbonisation measures include the adoption of electric mobility and alternative fuels, such as hydrogen and biofuels, as well as the development of green infrastructure. The study also discusses the complementary relationship between agricultural production and clean transportation systems, emphasising their contribution to a low-carbon economy. European initiatives such as the Green Deal and the Farm to Fork Strategy provide the necessary policy framework to facilitate this transition. In conclusion, achieving climate neutrality necessitates substantial investment in both technological and financial domains. Furthermore, there is an imperative for coherent alignment between environmental objectives, public policy and societal change.

Key words: *Climate change, agriculture, decarbonisation, transport sector, precision farming.*

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OCCUPATIONAL SAFETY AND HEALTH IN AGRICULTURE: CHALLENGES, REGULATIONS AND MODERN TRENDS[1]

Danijela Mirjanić[2], Nataša Kljajić[3], Bojan Dimitrijević[4]

Abstract

Occupational safety and health represent an essential part of every production process and a major challenge for both employers and employees. Agriculture is one of the most important sectors of the economy but also a high-risk sector with numerous occupational illnesses, workplace injuries, and even fatal accidents. Employees in this sector are exposed to various risks: mechanical injuries, improper handling of work equipment, unfavorable microclimatic conditions, chemical risks due to the use of pesticides and mineral fertilizers, as well as physical, biological and ergonomic burdens. In accordance with the Law on Occupational Safety and Health and other by-laws, as well as international regulations, employers in the Republic of Serbia are obliged to conduct risk assessments and implement measures that can reduce the likelihood of workplace injuries or occupational diseases. Protecting employees in agriculture is essential for promoting human rights, strengthening public health resilience, and achieving sustainable development goals related to health, labor, and food safety. Adequate protection and proper training of employees increase productivity, while costs arising from workplace injuries — such as production interruptions and sick leave — are significantly reduced. For employers, the occupational safety and health system is not only a legal requirement but also an investment in a more efficient, safer, and more stable work process. In agriculture, where risks are higher than in many other sectors, these issues are of special importance and require a systematic approach, continuous monitoring, and worker education. The aim of this paper is to examine the main obstacles to the implementation of occupational safety and health

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rules in agriculture, identify the most frequent causes of injuries, and determine how often protective measures and technical solutions are used. A special focus is placed on problems specific to agriculture in Serbia, including the predominance of small family farms, the high share of self-employed and seasonal workers, informal ("off-the-books") work, insufficient training of machinery operators, and limited financial resources for modern technology.

Key words: *Occupational safety and health, agriculture, workplace injuries, risks, preventive measures.*

FORECASTING TOMATO CULTIVATION AREA AND AVERAGE YIELDS IN THE REPUBLIC OF SERBIA[1]

Mladen Petrović[2], Vojin Cvijanović[3], Robert Radišić[4]

Abstract

In recent years, tomato cultivation area and yields in the Republic of Serbia have shown fluctuations influenced by changes in market demand, prices, available resources, and agricultural policy measures. As one of the economically most significant vegetable crops, tomato production requires careful planning based on reliable projections of future developments. This paper applies time series analysis using the ARIMA model to forecast the dynamics of tomato cultivation area and average yields in the Republic of Serbia for the next three years (2026–2028), based on historical data from the past twenty years. The aim of the research is to estimate future developments in production area and yields, in order to provide an analytical basis for production planning and agricultural policy-making. The results of the ARIMA modeling indicate expected changes in the extent of tomato cultivation and average yields in the coming years, which may support informed decision-making by producers, buyers, and policymakers. The obtained forecasts confirm the importance of applying quantitative methods in the analysis of vegetable production and in planning its development pathways.

Key words: *ARIMA models, tomatoes, cultivated area, average yields.*

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III SECTION: REVITALIZATION OF RURAL AREAS

DIGITAL AGRICULTURE AND SMART RURAL TOURISM: SYNERGIES FOR SUSTAINABLE DEVELOPMENT

Drago Cvijanović[1], Aleksandra Vujko[2], Emilija Vujić[3]

Abstract

This paper investigates stakeholder perceptions of the role of digital technologies in linking agriculture and rural tourism in the Fruška Gora region of Serbia. A total of 304 respondents were surveyed, including farmers, rural tourism stakeholders, local government representatives/DMOs, and visitors. Using a five-point Likert scale, the study assessed attitudes toward the impact of digitalization on tourism development, economic diversification, barriers to adoption, authenticity, and success factors. Descriptive analysis revealed generally positive perceptions, with local government representatives consistently displaying the strongest agreement, particularly regarding tourism development and institutional support. ANOVA confirmed significant differences between groups for two constructs, supporting the hypothesis that institutional actors are more optimistic than farmers, tourism providers, and visitors. The findings highlight the importance of cross-sector collaboration, investment in digital skills and infrastructure, and policies that bridge perceptual gaps among stakeholders, offering practical insights for sustainable rural development.

Key words: *Digitalization, agriculture, rural tourism, stakeholder perceptions, Fruška Gora, sustainable development.*

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GEOSPATIAL METHODOLOGIES FOR WINE TOURISM PLANNING: UNLOCKING RURAL DEVELOPMENT IN ŠUMADIJA[1]

Radmila Jovanović[2], Emilija Manić[3], Žaklina Stojanović[4]

Abstract

Wine tourism is one of the leading tourism products within rural regions, combining viticulture, gastronomy, cultural heritage, and scenic landscapes. At the same time, it has been seen as one of the strongest instruments in rural economy diversification. The article examines the potential of wine tourism in the Šumadija wine-growing region of central Serbia, utilizing a GIS-based methodology that leverages open geospatial data. Factors considered include tourist attractions, lodging options, dining service availability, and establishments related to wineries, all of which have been evaluated and integrated to produce the Wine Tourism Potential Index (WTPI). The results showed an uneven spatial distribution regarding wine tourism potential, with the highest values occurring within and around main urban centres and renowned vineyard areas, namely Kragujevac, Oplenac, Topola, and Aranđelovac. However, all these areas are still in the early stages of the wine tourism life cycle, offering limited organized wine tourism experiences to visitors. The results contribute to the foundation of strategic sustainable planning and development of wine tourism in Šumadija, with an emphasis on the development of structured tourism products, enhancement of visitor experiences, and coordination in promotional efforts. Apart from presenting substantial grounds for developing wine tourism based on WTPI calculations, the paper highlights wine tourism as an opportunity for revitalizing rural areas, promoting economic diversification, and enhancing territorial cohesion. An understanding

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of the role of geospatial analyses and open data in supporting sustainable tourism planning has practical relevance for policymakers, tourism developers, and those in local communities with a vested interest in wine tourism as an engine of rural development.

Key words: *Wine tourism, GIS, open geodata, rural development, wine tourism potential index (WTPI), Šumadija.*

RURAL TOURISM AS A FACTOR OF REVITALIZATION OF RURAL AREAS IN SERBIA[1]

Branko Mihailović[2], Vesna Popović[3]

Abstract

This paper examines rural tourism as an important auxiliary component of economic growth that can ensure the sustainable development and revitalization of Serbia's rural areas. The creation of extra revenue for rural households through a variety of operations, assistance, and complementary offers is therefore the main goal of growing this type of tourism. Therefore, the intention of this study is to investigate the possibility that rural households in Serbia could support themselves through rural tourism and grow to the point where they could serve as a useful basis for the development of rural areas. There is no doubt that Serbia has a wealth of natural resources that can be made more valuable through rural tourism. State participation, sufficient infrastructure, the use of existing funding sources, and efficient marketing are necessary to accomplish this. Supporting different collaboration models with registered rural holdings is essential in order to combine resources, expertise, and skills. Within the context of the EU IPARD initiative, special emphasis should be paid to the potential use of incentive financing programs for the growth of rural tourism.

Key words: *Rural tourism, rural areas, diversification, rural economy, financing.*

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CULTURAL AND ETHNO MANIFESTATIONS IN THE FUNCTION OF THE DEVELOPMENT OF RURAL TOURISM IN THE REGION OF WESTERN SERBIA[1]

Olgica Zečević Stanojević[2], Leposava Zečević[3], Dragan Nedeljković[4]

Abstract

The aim of this paper is to present the role of cultural and ethno manifestations in the development of rural tourism in Western Serbia, with an analysis of their effects, challenges, and opportunities for improvement. Through the analysis of quantitative and qualitative aspects of the role of cultural and ethno manifestations in Western Serbia, the paper explores their economic effects and impact on the local economy, with the goal of proposing practical managerial and marketing measures for enhancing the sustainable development of ethno manifestations in rural areas. The research results indicate that ethno manifestations are an important instrument in the protection and preservation of culture and, in practice, have a strong impact on the effective promotion, affirmation, and enrichment of the tourism product of Western Serbia, as well as on stimulating increased employment and competitiveness. The findings also emphasize the necessity of investing in infrastructure, professional management, and the improvement of marketing activities, promotion, and branding of ethno manifestations in Western Serbia. In this way, a stable foundation would be created for the long-term development of rural tourism in the region, while preserving cultural identity and improving the economy and quality of life of the local population.

Key words: *Ethno manifestations, rural tourism, marketing, Western Serbia.*

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BEE-FRIENDLY VILLAGES

Raluca Mihaela Ferii[1], Dariana Maria Voinescu[2], Ana Maria Ştefan[3]

Abstract

Honey bees have existed for millions of years, evolving natural systems that benefit their ability to survive and thrive. There is suggested a method of beekeeping based on deep respect for and understanding of the honey bee colony as a highly evolved system. Conventional beekeeping treats bees as livestock, prioritizing the desires and needs of humans, such as honey yields and agricultural crops, over the health of the pollinators and the Planet. Bees play a crucial role in sustaining biodiversity and food production, yet their numbers are declining worldwide due to habitat loss, pesticide use, and climate change. "One flower at a time" suggests that positive change can be accomplished gradually, with each individual contribution, symbolized by planting a single flower, together making a significant impact. This initiative brings together communities, schools, and faith organizations to take concrete action for the environment, one flower at a time.

Key words: *Honey bees, beekeeping method, one flower at the time.*

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LOCAL DEVELOPMENT STRATEGY: SOUTH DANUBE VALLEY LAG

Alexandru Gabriel Mazilu[1]

Abstract

Teleorman County, located in southern Romania and part of the South-Muntenia Region, has an economy mainly based on agriculture and faces challenges such as migration and population decline. The Local Action Group "South Danube Valley" seeks to support sustainable development through a territorial diagnostic analysis. The area's flat terrain and fertile soils favor farming, while urban centers like Alexandria, Turnu Măgurele, and Roșiorii de Vede act as economic hubs. Agriculture employs about half of the workforce, focusing on cereals, vegetables, and livestock. Industrial activity remains modest, mainly in food processing and construction materials. The population fell from around 475,000 in 1990 to 350,000 in 2024 due to migration and low birth rates. Despite environmental concerns such as deforestation and soil pollution, there is potential for renewable energy, especially solar and wind. Teleorman preserves valuable cultural heritage and traditions but requires modernization in health, education, and infrastructure, particularly in rural areas. This analysis outlines the county's main assets and challenges, providing a basis for strategies that promote sustainable growth, better living standards, and the protection of cultural and natural resources.

Key words: *LAG, Teleorman County, Romania, sustainable growth.*

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PERSPECTIVES ON SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT IN THE 21ST CENTURY

Lorena Cristina Pîrvu[1], Andreea Ana Maria Bulete[2], Valeria Gabriela Matei[3]

Abstract

Sustainable agriculture and rural development represent key pillars in addressing the global challenges of the 21st century. Climate change, population growth, food security, and the pressure on natural resources require innovative and environmentally friendly approaches to agricultural practices. This paper explores perspectives on sustainable agriculture as a driver for rural development, focusing on the economic, social, and ecological dimensions. Particular attention is given to the role of digitalization, green technologies, and policy frameworks such as the European Green Deal and the Common Agricultural Policy in shaping future strategies. Moreover, the paper highlights the importance of empowering rural communities through education, innovation, and sustainable food systems. By analyzing current trends and potential pathways, the study provides insights into how sustainable agriculture can contribute to resilient rural areas and long-term development at both local and global levels.

Key words: *Sustainable agriculture, rural development, EU policies.*

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THE IMPACT OF FINANCIAL RESOURCES IN SIBIU COUNTY ON RURAL DEVELOPMENT

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Abstract

The paper analyzes the impact of investments carried out through the PNDR and PNS on rural development in the Sibiu County, during the period 2015-2024. The socio-economic analysis highlights a relatively stable population, rising incomes, and agriculture dominated by cereals, supported by the modernization of technical and material resources. Investments had a fluctuating dynamic, with peaks in 2016-2017, and a sharp decline afterwards. The largest funds targeted rural infrastructure and the modernization of agricultural holdings, while small projects and cooperatives received limited resources. Statistical correlations indicate a positive impact of investments on mechanization and productivity, but also an unequal distribution of economic effects. In conclusion, investments have contributed to the modernization of agriculture and rural infrastructure, yet efficiency and equity remain challenges, requiring a strategy better aligned with the local needs to ensure a sustainable impact.

Key words: *Investments, rural development, Sibiu county, sustainability.*

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THE LOCAL DEVELOPMENT STRATEGY OF THE GAL VLASIA ILFOV

Bogdan Alexandru Răţeacă[1], *Mihaela Timoftioaea*[2]

Abstract

The local development strategy of the GAL Vlasia Ilfov, Nord-Est aims to transform the area, consisting of six peri-urban communities of Bucharest, into a competitive and sustainable development hub. The diagnostic analysis highlights the high agricultural potential, valuable natural and cultural heritage, but also the pressures of accelerated urbanization. The strategy outlines three major directions: increasing farmers' competitiveness and incomes by supporting small and medium-sized farms, revitalizing the local economy and developing rural infrastructure, as well as environmental protection and climate change mitigation. Measures include funding for SMEs, organic farming, local product processing, rural tourism development, and investments in public utilities. With a total budget of 2 million EUR, the strategy targets farm modernization, infrastructure improvements, support for over 20 SMEs, and new job creation, thereby contributing to a higher quality of life and stronger social cohesion in the region.

Key words: *Development strategy, sustainability, agriculture, funding.*

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APPLICATION OF SWOT ANALYSIS IN THE IMPROVEMENT OF RURAL TOURISM IN ZADAR COUNTY

Jurica Bosna[1], Adis Puška[2], Ilija Stojanović[3]

Abstract

This research aims to conduct a strategic analysis of rural tourism in Zadar County using the SWOT method. Tourism activities in the county are mostly focused on the sea and sun, while rural areas remain underdeveloped. Strengthening tourism in rural settlements is therefore important for achieving sustainable development across both coastal and inland areas of the county. In order to determine which advantages rural tourism should be built on, which shortcomings require urgent correction, which potentials should be used and which threats should be mitigated, the weight of the SWOT analysis statements will be determined using the SiWeC (Simple Weight Calculation) method. Expert opinion will be used for this purpose. The results of the research will contribute to the improvement of rural tourism in Zadar County.

Key words: *Rural tourism, SWOT analysis, Zadar County, SiWeC method.*

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ANALYSIS OF THE POTENTIAL FOR THE DEVELOPMENT OF ENTREPRENEURSHIP IN RURAL AREAS IN THE REPUBLIC OF SERBIA[1]

Gordana Radović[2], Radovan Pejanović[3], Zorica Vasiljević[4]

Abstract

In order to develop rural economies in the Republic of Serbia, the development of entrepreneurship is necessary. The development of entrepreneurship is needed, both in the field of primary agricultural production and in the field of processing of agricultural products, but also in non-agricultural activities, which are insufficiently developed according to the results of the last Census of Agriculture. The aim of the paper is to analyze the potential for the development of entrepreneurship in rural areas in the Republic of Serbia, in the segment of human and financial resources. The authors analyze the period 2014-2024 and conclude: that the average unemployment rate of the population in the working age of 15-64 in rural areas in the specified period was 13%; that in the age structure of unemployed residents in rural areas, the dominant average share in the analyzed period was occupied by residents in the age group of 25-34; that in the educational structure of unemployed residents in rural areas, the dominant average share in the analyzed period was occupied by residents with a secondary vocational education. All the above indicators indicate that there are adequate human resources for the development of entrepreneurship in rural areas in the Republic of Serbia. In terms of financial resources, in the current period there are incentives for the development of entrepreneurship within the agricultural budget and the IPARD III program, but also within the subsidies of the Ministry of Economy of the Republic of Serbia. The authors conclude that in order to develop

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entrepreneurship, education of residents of rural areas is needed, as well as better information about available subsidies, as well as promotion of quality entrepreneurial ideas.

Key words: *Entrepreneurship, human resources, financial resources, development, rural areas, Republic of Serbia.*

MULTIFUNCTIONAL APPROACHES ON RURAL DEVELOPMENT, LABOR FORCE AND EDUCATION IN AGRICULTURAL SECTOR UNDER THE TWIN TRANSITION

Violeta Sima[1], Ileana Georgiana Gheorghe[2], Stefan Laurentiu Prahoveanu[3]

Abstract

Starting from the concept of the double transition, the paper deals with the multifunctional character of rural areas in today's society and analyses how, from this perspective, adopting a "double transition" approach can generate new dimensions in agriculture and rural areas. In the context of sustainable development, more efficient use of available resources can improve the quality of life in rural areas. In this sense, this paper proposes a multifunctional approach to rural development in the context of the twin transition. The topic is current and complex, at the intersection of European public policies, technological innovation, sustainability, and the trend toward vocational training in rural areas. Thus, in rural areas, the green (ecological) transition focuses on adapting the agricultural system to current climate change, reducing the carbon footprint, integrating the circular economy, protecting biodiversity, aiming to support sustainable agriculture, and maintaining the balance of ecosystems and the responsible use of resources. On the other hand, the digital transition focuses on adopting innovative technologies such as AgriTech, IoT, drones, big data, and AI to increase economic efficiency and enhance connectivity, enabling monitoring of how resources are obtained and used. Multifunctional rural development refers to the fact that it tries to overcome the mono-sectoral agricultural model and moves towards diversification, through the development of agritourism, supporting the bioeconomy or the economy based on bio-resources, the use of renewable energy, the use of rural social services (which help vulnerable people), the inclusion of digitalization in the rural environment, the development of local public-private partnerships. The main challenge is balancing urban development and village

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revitalisation. Therefore, in this area, it is necessary to support professional retraining and continuous training to develop digital and ecological skills.

Key words: *Twin transition, agriculture, rural development, labor force, education.*

SUSTAINABLE TRANSFORMATION OF RURAL COMMUNITIES THROUGH THE DEVELOPMENT OF A RURAL TOURISM PRODUCT[1]

Predrag Todorov[2], Zoran Simonović[3]

Abstract

This scientific paper examines the role of developing a rural tourism product as a driver of the sustainable transformation of rural communities. Building on contemporary approaches to rural development, the analysis explores how rural tourism contributes to the diversification of economic activities, the preservation of natural and cultural resources, and the improvement of residents' quality of life. The development of an authentic tourism product is considered a mechanism that activates local potentials, encourages entrepreneurship, and strengthens community identity. The paper emphasizes the economic, social, and environmental effects of rural tourism through the lens of sustainability, as well as the importance of integrated planning and the participation of local stakeholders in decision-making processes. Special attention is devoted to a conceptual model that explains the key mechanisms of transformation and their impact on the long-term revitalization of rural areas.

Key words: *Rural development, rural tourism, tourism product, sustainability, local community, transformation.*

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IV SECTION: DIGITALIZATION IN AGRICULTURE

DIGITAL MARKETING IN THE PROMOTION OF RURAL TOURISM AND GASTRONOMY IN THE RASINA DISTRICT

Drago Cvijanović[1], Bojana Ostojić[2], Goran Maksimović[3]

Abstract

The aim of this research was to analyze the application of digital marketing in the development of rural tourism and the promotion of gastronomic events in the Rasina District. The study was conducted during 2025 and involved 153 respondents, including local entrepreneurs, event organizers, and participants from the tourism sector. The results indicate that most local actors have not yet fully developed digital marketing strategies, while awareness of the importance of digital tools varies, highlighting a significant need for education and support. Respondents emphasized the high potential of digital campaigns, particularly through the use of video content and collaboration with influencers, to increase attendance and promote events. Moreover, the majority believe that additional training in digital marketing significantly contributes to the improvement of business performance and the visibility of tourist events. These findings underscore the need for a strategic approach, sector coordination, and continuous investment in digital competencies to enhance the competitiveness and recognition of the destination.

Key words: *Digital marketing, rural tourism, gastronomy, tourist events.*

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THE CONTRIBUTION OF THE SPACE ECONOMY TO THE DEVELOPMENT OF AGRICULTURE

Zoran Tomić[1]

Abstract

The growing importance of the space economy is reflected not only in space exploration but also in its contribution to the development of key sectors on Earth. One of the most significant examples is agriculture, which faces the challenges of climate change, a growing global population, and the need for sustainable resource management. The paper examines the application of space technologies in agriculture, encompassing satellite navigation, remote sensing of the Earth, meteorological satellites, communication systems, and microgravity experiments. It is shown that these technologies lead to an increase in yield by 10–15%, a reduction in production costs by 15–20% and a rational use of water and fertilizers by 20–30%. Through examples from the EU, India, Africa, and Serbia, the paper highlights both concrete economic and social benefits and challenges, including high costs, limited digital literacy, and institutional shortcomings. It was concluded that integrating the space economy into the agricultural sector represents a strategic direction for sustainable and competitive agriculture, with particular importance for Serbia, where agriculture is a key economic sector.

Key words: *Space economy, agriculture, precision agriculture, satellite data, sustainable development.*

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INNOVATION AND DIGITALIZATION IN AGRICULTURE AND RURAL DEVELOPMENT

Andreea Dobra[1], Alexandra Maria Trîmbez[2], Costa Alexandru Varghida[3]

Abstract

Innovation and digitalization are transforming modern agriculture, offering tools and techniques that increase productivity while promoting sustainability. This study examines the role of precision farming, Internet of Things (IoT) devices, drones, and satellite monitoring in optimizing resource use, reducing environmental impact, and enhancing decision-making processes at farm level. By integrating technology into agricultural practices, farmers can monitor soil health, water usage, and crop growth in real time, leading to more efficient and environmentally friendly production systems. Additionally, digital platforms facilitate knowledge sharing, market access, and cooperation among rural communities, supporting local economies. The research highlights successful case studies from Europe, illustrating how technology adoption improves both economic performance and environmental outcomes. Challenges such as high initial investment, digital literacy, and infrastructure limitations are discussed. Finally, the study provides recommendations for policymakers and stakeholders to accelerate technology-driven sustainable agriculture and rural development.

Key words: *Innovation, digitalization, agriculture, rural development.*

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WITH AI ON THE FIELD: ANALYSING THE PROS AND CONS OF USING MODERN TECHNOLOGY IN AGRICULTURE

Smaranda Elena Iordache[1]

Abstract

In a world that is facing various social, economic and climatic challenges, there is a need to consider how it could be managed available resources. Agriculture is an important economic sector necessary for human survival. Technological advances can be useful if they are use to improve current understanding of food quality and the environment, ease farmers' workload, and intervene promptly with dedicated solutions for problems in the field. Although intensive farming methods result in rich crops, the downside is the negative impact on soil, water, and biodiversity. In this paper, it was analysed four Central and Eastern European countries - Romania, Poland, Bulgaria, and Serbia, in terms of agricultural land size and grain exports. Further, the advantages and obstacles of using new technologies in agriculture are pointing out. The paper's research question is whether technological innovation in agriculture is beneficial in terms of product quality, process efficiency, and environmental protection.

Key words: *Agriculture, AI, modern technology, sustainability.*

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APPLICATION OF MICROCONTROLLERS IN SMART AGRICULTURE

Vladimir Pejanović[1], Goran Zarić[2], Vladan Cogoljević[3]

Abstract

This paper explores the potential of microcontrollers as electronic components in agricultural production within the concept of smart and precision agriculture. The technical architecture of a system based on the STM32F4 microcontroller that implements a multi-layered approach with integrated sensors and machine learning algorithms for predicting optimal agricultural treatments is analyzed. Extensions of the sensor platform, architectural system improvements, and implementation of advanced artificial intelligence techniques are proposed. The research points to the competitive advantages of microcontroller solutions in terms of cost savings, increased efficiency, and sustainability of agricultural production, with special reference to the potential for application in the Republic of Serbia.

Key words: *Microcontroller, smart agriculture, sustainability, decision making, system architecture, sensors.*

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CARTOGRAPHIC MAPPING OF POTATO-RELATED STATISTICAL DATA AT THE MUNICIPAL LEVEL IN THE REPUBLIC OF SERBIA[1]

Darko Jaramaz[2], Irina Marina Stević[3], Darko Jakšić[4]

Abstract

Integration of spatially oriented with statistical data was performed by employing Geographic information system (GIS), and municipalities with a high proportion of area under potato cultivation were identified in the Republic of Serbia, as well as the total used agricultural land area, and cropland and garden areas. A correlation analysis was also performed between potato, total used agricultural land, and cropland and garden areas expressed as percentage representation. The large percentage of potato cultivation has been observed in the western part of the country, in the municipality of Ivanjica and the surrounding municipalities, which confirms previous research, also the strong negative correlation coefficient was identified between Potato area percentage and Cropland and garden area percentage at municipality level. The statistical data are obtained from Farm Structure Survey 2018 and Census of Agriculture 2023, while spatially oriented data are obtained from Republic Geodetic Authority (RGA) of the Republic of Serbia.

Key words: *GIS, potato, Farm Structure Survey 2018, Census of Agriculture 2023.*

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DIGITALIZATION OF THE AGRICULTURAL SECTOR: DRIVER OF COMPETITIVENESS AND SUSTAINABILITY OF THE RURAL ECONOMY

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Abstract

The digital transformation of agriculture represents a key catalyst for enhancing competitiveness, productivity, and sustainability within the rural economy. In recent years, the integration of digital technologies- such as precision farming, smart sensors, data analytics, drones, and artificial intelligence- has reshaped traditional agricultural practices, contributing to more efficient resource management, reduced environmental impact, and improved decision-making processes. This paper explores the role of digitalization as a strategic driver of rural development, emphasizing its potential to increase value creation, foster innovation, and strengthen the resilience of rural communities. The analysis highlights both the opportunities and challenges associated with digital adoption, including issues related to digital infrastructure, technological literacy, financial accessibility, and policy support. The findings underline that digitalization, when supported by coherent policies and inclusive strategies, can significantly boost the competitiveness of the agricultural sector and promote long-term sustainability of rural economies within the broader context of the European Green Deal and global sustainable development goals.

Key words: *E-agriculture, rural economy, competitiveness, sustainability, innovation.*

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CAUSES OF THE CURRENT UNEVENNESS OF ROMANIAN AGRICULTURE

Paun Ion Otiman[1], Nicoleta Mateoc Sîrb[2], Adrian Băneș[3], Cosmin Sălășan[4], Andrea Feher[5], Miroslav Raicov[6]

Abstract

This paper examines the precarious state of Romanian agriculture and rural development, attributing its challenges to a history of political, economic, and agrarian fractures - specifically the reforms of 1921 and 1945, collectivization (1949–1962), and undoing the forced collectivization after 1989. These changes, along with unsuitable national and European Common Agricultural Policies (CAP) post-EU accession in 2007, have resulted in an unstable, non-competitive, and strongly bipolarized agrarian structure. The current structure is deeply unbalanced, consisting of over 95% small, non-commercial subsistence farms, a small share of commercial family farms, and large, latifundia-type corporate farms (0.3% of holdings) that control a major portion of the agricultural area. Key issues include a low degree of agricultural land use (39-40% vs. 80% in France), high dependence on weather conditions, a low level of capital endow-

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ment (10-12 times lower than the EU average). Consequently, Romania presents low crop yields, a primary-phase agricultural economy, significant food imports (27.8% of consumption), and widespread rural poverty. The current system, favors large, export-oriented farms, often "exporting" subsidies. A set of articulated recommendations for public policy is proposed by the authors to alleviate the influence of the identified and quantified factors to stabilize and develop further a European Agriculture in Romania.

Key words: *Romanian agriculture, structural issues, precariousness factors analysis.*

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