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SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT V

Book of Abstracts

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PLENARY SECTION II

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 Book of Abstracts includes selected articles presented at the International Scientific Conference – Sustainable Agriculture and Rural Development V, which was held in Belgrade on December 12-13th, 2024.

In the Book of Abstracts are included abstracts from Serbia, along with the invited and other abstracts 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.

Publisher and editors are not responsible for the content of the abstracts of scientific papers and opinions published in the Book of Abstracts, as they represent the author's point of view. Publishing of the Book of Abstracts was financially supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia.

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BOOK OF ABSTRACTS

PLENARY SECTION I

THE ANIMAL PRODUCTION PARADOX: NAVIGATING ETHICS AND ECONOMICS IN MODERN FARMING

Barbara Luštrek[1], Vesna Gantner[2], Klemen Potočnik[3]

Abstract

Modern farming methods in developed countries often prioritize efficiency at the cost of animal welfare, environmental sustainability, and public health. Intensive livestock farming contributes to biodiversity loss, greenhouse gas emissions, and resource degradation, raising concerns about long-term viability. While only a small portion of the global population lives in these regions, changes in their agricultural practices have global consequences. This paper explores ethical and economic issues in livestock farming and suggests solutions such as regenerative agriculture, agroecological practices, and digital technologies. For example, regenerative agriculture can restore soil health, improve biodiversity, and reduce carbon emissions, while digital technologies such as precision farming can optimize resource use and minimize waste. The role of smallholder farmers in promoting sustainable, resilient food systems is highlighted, emphasizing their ability to utilize local ecosystems and traditional knowledge. The paper calls for a multidimensional approach that integrates ethics and economics in agriculture. Collaboration between policymakers, farmers, and consumers is essential to create a humane, sustainable, and equitable food system.

Key words: *animal production paradox, modern farming, economics.*

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REALITIES AND CHALLENGES IN FINANCING AGRICULTURE IN EU: SOME INSIGHTS FORM ROMANIAN PERSPECTIVE

Dumitru Nancu[1], Bianca-Florentina Nistoroiu[2], Madalina Ionescu[3], Stefan Laurentiu Prahoveanu[4]

Abstract

The agricultural sector continues to represent a key area of economic activity within the European Union (EU), providing a substantial contribution to food security, rural development and sustainable economic growth. Access to finance represents a significant challenge, yet an important factor in supporting innovation and improving productivity within the context of the EU's Common Agricultural Policy (CAP) and the pursuit of sustainability goals. Agricultural financing in the European Union (EU) is confronted with a multitude of challenges, including the necessity to adapt to evolving policy frameworks, climate impacts, and technological innovations. The financial landscape of Romania is less diversified than that of other EU member states, with a corresponding reduction in the availability of credit and financing options that are tailored to the specific needs of the agricultural sector. The absence of specialised financial institutions dedicated to the agricultural sector, such as cooperative banks, constrains the access of small farmers to capital. Moreover, private investment in agriculture is constrained by the perceived risks associated with the sector, which creates a funding gap for growth and modernisation. This article investigates some of the specific key challenges and realities in agricultural financing within the EU with a focus on Roma-

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nia, exploring the country's specific circumstances in detail. Examining the European agricultural policy landscape, funding mechanisms, and the role of financial institutions, the article also aims to highlight the major aspects of Romanian policy challenges and implications for agricultural development in the context of the EU's sectorial approaches.

Key words: *agriculture, Common Agricultural Policy, investments, financing, modernisation*.

RURAL TOURISM AND SUSTAINABLE DEVELOPMENT IN THE DISTRICT OF GENERAL PUEYRREDON (ARGENTINA). CHALLENGES AND OPPORTUNITIES IN THE CONTEXT OF TOURISTIFICATION

Graciela Benseny[1]

Abstract

The district of General Pueyrredon (Argentina), with Mar del Plata as its main city, has a large peri-urban territory with scenic, agricultural and cultural characteristics that favour rural tourism, based on local cultural traditions and contact with nature. In recent decades, it has become a strategy for economic diversification that favours sustainable development and careful management of the effects of touristification, which can lead to the commodification of culture and the loss of local identity. The aim is to explore the opportunities and challenges of rural tourism in the district of General Pueyrredon, analysing its relationship with sustainable development and the implications of touristification in the region. An exploratory and descriptive study is carried out, consulting bibliographic, documentary, graphic and virtual sources, taking as a case the Estancia Santa Isabel, whose productive diversification allows its positioning as an innovative reference of rural tourism.

Key words: *Rural Tourism, Sustainable Development, Touristification, Estancia Santa Isabel (Argentina).*

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VITICULTURE ZONING AS A TOOL FOR RURAL DEVELOPMENT AND CLIMATE CHANGE ADAPTATION IN VALLE D'ITRIA (ITALY)

Pierfederico La Notte[1], Darko Jaksic[2]

Abstract

The Valle d'Itria, a picturesque hilly region in Apulia, Italy, renowned for its cultural heritage and premium white wines from native grapevine varieties, is facing significant viticultural challenges due to Xylella fastidiosa and the impacts of climate change. The overarching "Relaunching of Viticulture in Valle d'Itria" pilot project (2024–2026), coordinated by CNR-IPSP Bari and supported by the Apulia Region, aims to revitalize viticulture and oenology through innovative approaches. Within this framework, the Institute of Agricultural Economics Belgrade is implementing a sub-project focused on viticulture zoning. This initiative involves conducting OIV-compliant meso-zoning to delineate homogeneous wine-growing areas, fostering precision viticulture, modeling, and sustainable resource management. Additional actions include establishing experimental vineyards, breeding resilient grapevine varieties, and leveraging synergies between viticulture, winemaking, tourism, and environmental conservation. By promoting sustainable practices and valorizing local resources, the project seeks to mitigate climate impacts, support rural livelihoods, and stimulate economic revitalization through wine tourism and investment attraction.

Key words: *Viticulture zoning of wine-growing areas, climate change, Valle d'Itria.*

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THE IMPACT OF THE EU EMISSIONS TRADING SYSTEM (EU ETS) ON AGRICULTURE: CHALLENGES AND OPPORTUNITIES

Vesna Gantner[1], Boro Krstić[2], Ranko Gantner[3], Klemen Potočnik[4], Krešimir Kuterovac[5]

Abstract

The aim of this review was to analyse the European Union Emissions Trading System (EU ETS) and its indirect effects on agriculture. While the EU ETS targets major industries like energy and manufacturing, agriculture is not directly regulated, yet the sector is impacted by rising energy, fuel, and fertilizer costs due to carbon pricing. The increased financial burden may strain farmers, particularly small-scale producers, who may struggle with higher production costs. Additionally, the introduction of the Carbon Border Adjustment Mechanism (CBAM) could intensify global competition for EU farmers, especially those producing carbon-intensive products. Although sustainable practices like carbon sequestration offer potential benefits, many farmers may lack the resources or technology to implement them. The review highlights the need for targeted support to help farmers transition to low-carbon practices without compromising their economic viability, ensuring that EU agriculture can remain competitive while contributing to the EU's climate goals.

Key words: *EU Emissions Trading System (EU ETS), carbon quotas, agriculture, climate policy, Carbon Border Adjustment Mechanism (CBAM).*

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DIGITALIZATION IN AGRICULTURE AND BARRIERS IN DATA ERA

Vili Dragomir[1], Steliana Rodino[2]

Abstract

Digitalization of agriculture replaces traditional farm methods with advanced technologies involved in IoT, AI, big data, and machine learning. These innovations have enabled precise farming, wherein farmers go by guidelines in real time through sensors and satellite data on the exact usage of water, condition of the soil, yield of crops, and control over pest manifestation. The involvement of smart machinery and automated systems eases the process of farming and reduces wastage to achieve more viable agricultural methods by providing tailored solutions according to insights from data in detail. However, there are a few limiting factors that have come in the way of transitioning to a completely data-driven agriculture model. It is the digital divide between towns and countryside that gets in the way of proper access to essential infrastructure made of reliable internet and modern technology. In developing regions, too, the costs of implementation can be very expensive for small and medium-scale farms to access advanced technologies. Another major barrier is data privacy and security. Farmers, therefore, may be reluctant to use digital solutions because of apprehension with regard to data ownership, including highly sensitive information that is vulnerable to abuse. Finally, there is an issue with knowledge: the farmer needs training in order to get the best from digital tools and complex data. When these barriers are addressed, full realization of digital agriculture will then allow the food production system to be resilient and sustainable in the big data era.

Key words: *Digitalization, data privacy, knowledge.*

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PLENARY SECTION II

SUBSIDIES AS A TOOL FOR EMPOWERING SMES: FROM EMPIRICAL EFFECTS TO FUTURE OPPORTUNITIES IN AGRI-FOOD SECTOR

Aleksandar Zdravković[1], Olivera Jovanović[2], Jovan Zubović[3]

Abstract

Subsidies for small and medium-sized enterprises (SMEs) are the most important agricultural policy instruments in developing countries. They can be used to finance various needs of enterprises in primary agricultural production, food industry or in rural tourism. The expected impact of the granted subsidies is aligned with the primary objective of the enterprise's activities: to achieve growing profit as the most significant financial outcome.

The analysis in this paper aims to estimate the impact of subsidies on selected business results of SMEs in Serbia from 2013 to 2018, as well as their alignment with the basic postulates of business activity. The sample consists of 226 enterprises registered for activities belonging to the agri-food sector. The effects of subsidies were estimated using the econometric analysis of panel data, with net profit as the dependent variable and total assets and total liabilities as the independent variables.

Key words: *agribusiness, SMEs, subsidies, profit, panel analysis, Serbia.*

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THE ROLE OF REGENERATIVE AGRICULTURE IN SUSTAINABLE DEVELOPMENT

Divna Simić[1], Nataša Tolimir[2], Snežana Janković[3], Slavica Čolić[4], Vera Popović[5], Marijana Maslovarić[6], Slađan Stanković[7]

Abstract

Regenerative agriculture encompasses a range of sustainable development practices focused on soil health, biodiversity, carbon sequestration and a holistic approach. The topicality of regenerative agriculture can be seen at the level of the academic community, farmers and politics. Looking into literature, it can be concluded that the term has not been fully defined albeit the basic principles being well understood; yet concrete practices may differ, with the possibility to adapt or to flex in different contexts. Continuous research aims at determining the effects of regenerative agriculture in crop farming and fruit growing, as well as in integrated systems of crop production and animal husbandry. The importance of regenerative agriculture has been increasing with the need for sustainable systems resistant to climate change

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and economic pressures that improve productivity and the welfare of livestock and preserve ecosystems. The aim of this study is to point out the multiple importance of regenerative agriculture, the need to define the term precisely, to show certain practices in plant production and an integrated system with livestock production, and to point out the role of education on the advantages of these practices.

Key words*: Regenerative agriculture, plant production, animal husbandry, integrated system, education.*

THE MODEL OF INTERNAL CONTROL FOR AGRICULTURAL COMPANY

Jelica Eremić-Đođić[1], Jelena Popov[2]

Abstract

Every agricultural company has its own mission, vision, and goals. Good process management of agricultural company is not possible without the establishment of a solid control framework and well-established internal controls. Internal controls represent a very important tool for the management so they can control the company`s environment as well as the risks that affect its operations and other elements of the COSO framework. Defining the risk, evaluating and prescribing internal control for its elimination helps the management to ensure that the financial statements of the agricultural company are objective, true and accurate.

This paper will present a model made up of a series of internal controls that help to put the key processes for financial reporting in an agricultural company under control. The result of this model is that the company fulfills the obligation that ensure compliance with regulatory legal acts and that the management makes decisions on a more reliable basis in order to achieve the set goals of the agricultural company.

Key words: *internal control, financial statements, managing.*

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MONEY LAUNDERING: A CURRENT MANIFESTATION OF ECONOMIC CRIME IN AGRIBUSINESS

Miljana Barjaktarović[1], Dragan Cvetković[2]

Abstract

The economic system of a country can be threatened in various ways, with contemporary threats often involving sophisticated methods employed by criminals and criminal organizations, particularly within the realm of economic crime. A key activity in this context is money laundering, which poses an increasingly serious global problem. There is no area, sector, or entity within the economic and financial system, including agribusiness, that is not vulnerable to money laundering, one of the most severe manifestations of economic crime. Essentially, money laundering involves the legalization of income obtained through criminal activities, which has extremely negative impacts on the economic, political, legal, cultural, and other critical aspects of society, disrupting the smooth functioning of the economy. The purpose of this paper is to emphasize the substantial harmful impact of money laundering on society as a whole and to highlight the importance of the efforts by regulatory authorities and other societal actors in combating this form of crime.

Key words: *economic crime, money laundering, agribusiness and economy.*

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ECONOMIC ASPECTS OF DIGITAL TECHNOLOGIES IN AGRICULTURAL PRODUCTION[1]

Sanjin Ivanović[2], Saša Todorović[3]

Abstract

Digitalization in agriculture is an increasingly important phenomenon, involving broad range of activities not only in agricultural production, but also in decision making (management) process at farm level, new approaches to financing of farm activities, etc. Nevertheless, growing importance of digital technologies in agricultural production is not followed by sufficient research on its economic aspects, costs related to their application as well as economic efficiency of investments in this field. Therefore, managers of family farms and agricultural enterprises do not have appropriate insight in real economic consequences (but also social, environmental and political implications) of their deeper involvement in production based on information technologies. The goal of this research is to discuss economic aspects of various ways of using digital technologies in agricultural production.

Key words: *information technologies, costs, investments, agriculture, management.*

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I SECTION - AGRIBUSINESS

AGRIBUSINESS AND SUSTAINABILITY: SUCCESS MODELS AND FUTURE STRATEGIES

Alin-Ionuț Petrică[1], Dragoș-Nicușor Popa[2]

Abstract

Sustainability has become a crucial aspect of modern agribusiness, as companies and entrepreneurs seek to balance economic growth with environmental stewardship. This paper investigates the role of sustainable practices in agribusiness, highlighting models of success from around the world. The study emphasizes innovations such as organic farming, resource-efficient technologies, and the circular economy, which enhance productivity while minimizing environmental impact. It also explores how agribusinesses are adapting to global challenges such as climate change and resource depletion. By analyzing successful case studies, the paper identifies key strategies for long-term sustainability in the sector and the role of policy support in fostering sustainable growth. The research concludes that the future of agribusiness lies in integrating sustainability at every level, from production to distribution, ensuring both profitability and environmental responsibility.

Key words: *sustainability, agribusiness, strategies.*

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ANALYSIS OF FOOD SECURITY IN EUROPEAN UNION

Ana Nițu[1], Bilent-Marin Gürler[2]

Abstract

This paper aims to assess the state of the European Union's food sector from a food security perspective and seeks to answer the question 'How has food security evolved in response to recent global events within the EU?'. The research objectives include identifying the current status, vulnerabilities, and external factors influencing food security. To achieve relevant findings, we will analyze statistical indicators such as the average protein availability, food deficit, variability of food production per capita, and the proportion of the underweight population. By evaluating the significance of these results and reviewing relevant literature, we will provide insights into the current living conditions in the European Union with regard to the food sector.

Key words: *food efficiency, food importance, food security evolution.*

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THE LINK BETWEEN GROWTH, EMISSIONS AND CLIMATE FINANCE FOR SUSTAINABLE DEVELOPMENT: ROMANIA – SERBIA

Ana-Maria Pîrvu[1]

Abstract

The present study titled „The Link Between Growth, Emissions, and Climate Finance for Sustainable Development of Romania and Serbia" explores the interconnections between economic growth, greenhouse gas emissions, and climate finance, highlighting the importance of these relationships in sustainable development. We analyze how economic growth can influence carbon emissions and how, at the same time, investments in climate finance can contribute to reducing negative environmental impacts. The study emphasizes the need for integrated policies that promote sustainable economic development while reducing emissions and supporting the transition to a green economy. Through data analysis and case studies, solutions are proposed to encourage synergies between these critical dimensions, ultimately contributing to achieving global sustainable development goals.

Key words: *sustainable, climate finance, green economy.*

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AN OVERVIEW OF AGRIBUSINESS IN ROMANIA

Andreea Antonescu[1], Felicia-Maria Potcovaru[2], Saian Nasri-Nahar[3]

Abstract

This investigation analyzes the agricultural industry in Romania, focusing on the major players, technological advances, obstacles and sustainability. It highlights that the most important crops and actors in Romanian agriculture are small-scale farming and cereal production. There are discussions on how recent advances in agricultural technology such as automation, precision farming and digital tools could improve efficiency. In addition, issues facing Romanian agribusiness are at the center of the study, such as lack of infrastructure and limited access to capital. At the same time, it highlights opportunities for organic farming and export.

The environmental impact of agriculture is examined, with an emphasis on sustainability efforts and the adoption of greener practices. Government incentives and programs that help the sector are examined, noting both the benefits and drawbacks of policy implementation. Investments in infrastructure and innovation are essential to remain competitive, according to the outlook for Romanian agribusiness. Finally, the study focuses on long-term environmental sustainability issues and aims to align with the EU's environmental objectives. The study found that although Romania faces many challenges, it has many opportunities to grow, innovate and make progress in the environmental field.

Key words: *agriculture, data, technology, investment, growth, sustainability.*

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ANALYSIS OF CRISIS SITUATIONS IN THE AGRI-FOOD SECTOR CASE STUDY – THE COVID-19 PANDEMIC

Bianca-Maria Boțîrcă[1], Ionela Sailă[2], Mădălin-Ionuț Sandu[3]

Abstract

The following study analyzes the impact of the Covid-19 pandemic on the agri-food sector, a crucial domain for economic stability and public well-being. The goal is to understand how the pandemic has influenced food supply, consumption, and production, addressing both economic and social perspectives. The study is structured into three chapters: the first reviews theoretical concepts related to economic and agri-food crises; the second analyzes the pandemic's impact on demand, supply, foreign trade, and consumer price indices; and the third presents a case study based on statistical data, evaluating public perception of the crisis through a questionnaire. The results will provide a comprehensive perspective on the dynamics of the agri-food market in the context of the pandemic and the challenges faced by producers and retailers.

Key words: *Agri-food crises, COVID-19 pandemic, Case study.*

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FINANCIAL CONSULTING AS A FACTOR IN THE DEVELOPMENT OF AGRIBUSINESS IN SERBIA[1]

Branko Mihailović[2], Katica Radosavljević[3], Vesna Popović[4]

Abstract

Financial consulting can be defined as expert assistance to company managers in analyzing and solving practical financial problems. Accordingly, the primary objective of the research in this paper was to examine the role of financial consulting in agribusiness in the Republic of Serbia, demonstrating that the use of financial consulting represents a significant support for economic actors in agribusiness. Financial consulting adapts its services not only to specific sectors but also to the size of the enterprise. In this regard, the paper focused on financial consulting as a factor that facilitates business decision-making related to the financial aspects of operations in the agribusiness sector. Specifically, the process of financial consulting involves the transfer of relevant financial knowledge, information, and business experience. The conducted research showed that financial consulting in Serbia's agribusiness is a complex and demanding discipline within the fields of business and applied economics, and that optimizing business results for the client requires business competence, professional experience, and ethical conduct from financial consultants.

Key words: *financial consulting, agribusiness, performance, financial analysis, financial restructuring.*

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ENTREPRENEURIAL SKILLS FOR SUSTAINABLE AGRICULTURE: PERSPECTIVES AND CHALLENGES FOR YOUNG FARMERS

Carmen Valentina Rădulescu[1], Adele Finco[2], Sorin Burlacu[3], Florina Bran[4]

Abstract

This research aims to identify essential entrepreneurial skills in the agricultural sector by analyzing the perspectives of agribusiness students on the skills required for entrepreneurial success. The study aims to deepen the understanding of the critical aspects that contribute to the development of a sustainable and competitive agriculture in the countryside. However, an important research gap is the lack of a detailed analysis of the concrete effect of entrepreneurial skills on the economic performance of farmers in diverse regional and economic contexts. This gap highlights the need for further research that explores this relationship, providing a more comprehensive practical understanding of agricultural entrepreneurship. The research methodology includes a mixed approach, combining the analysis of specialized literature with a survey applied to students of the Faculty of Agro-Food and Environmental Economics at the Academy of Economic Studies in Bucharest. The literature review plays a crucial role, providing a solid theoretical foundation and contextualizing the empirical research, facilitating the identification of the most relevant entrepreneurial skills and challenges in the agricultural sector. The main findings highlight the importance of skills in innovation, adaptability to market changes and technology, alongside digital skills and social capital, essential for collaboration and access to resources. The study also emphasizes the role of entrepreneurial education and orientation towards sustainable practices, critical for young entrepreneurs in maintaining the stability and viability of agricultural businesses in the long term. The added value of the research consists in defining an updated set of skills adapted to the

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modern requirements of the agricultural sector, providing recommendations for educational programs that can support sustainable rural development through essential entrepreneurial skills. Limitations of the research include applying the survey to a single university sample, which may limit the generalizability of the results, and the fact that student perceptions do not fully reflect the complexity of real-life agricultural entrepreneurship. Future research directions could examine the concrete impact of entrepreneurial skills on farmers' economic performance in various regions and the effect of entrepreneurship education programs on youth employability in the agricultural sector, helping to bridge current gaps in literature.

Key words: *entrepreneurial skills, sustainable agriculture, rural innovation, agricultural education, digitization.*

RICE – BETWEEN TRADITION AND BUSINESS: CASE STUDY ROMANIA

Dan-Marius Voicilaș[1], Camelia Gavrilescu[2], Ion Certan[3]

Abstract

Historical studies show that rice has been cultivated in the Eastern part of the Roman Empire, coming from Asia, and gradually became part of the European diet. It became an important ingredient in the Romanian cuisine under Greek and Turkish influences during the last centuries of the Ottoman Empire presence in the Balkans. In the 70-s, in Romania, rice was among the agri-food products with high imports (after sugar and citrus fruit). In 1972, Romania joined the International Bank for Reconstruction and Development, and was the only socialist country to collaborate with the World Bank. It adopted the import substitution policy concept, quite popular among the developing countries in the 50-s and 60-s, which promoted the idea of a continuous substitution of imports by domestic production. In this vein, taking advantage of its friendship with Asian countries such as China and Vietnam, Romania revived its rice cultivation and production, all along focusing research on creating new rice varieties, suitable and well adapted to the favorable conditions in the Danube meadow and Delta. As a result, areas under rice increased substantially in the 80-s, and production was able to cover the domestic demand and even for some exports. After 1990, rice cultivation and production collapsed, due to several contributing factors such as: import liberalization, land fragmentation and restitution to former owners as result of agricultural cooperatives dismantling, reorientation of crops with high degree of mechanization and international competitiveness (such as wheat, maize, sunflower and rapeseeds), and land grabbing by foreign companies and joint ventures. Nowadays, prices of rice imported from Central and south-Eastern Asia increased considerably due shipment costs which multiplied at least 6 times. In this context, the present paper examines the current situation, the evolution of entrepreneurship in rice cultivation in Romania, and makes a comparative analysis of productivity by farm size. In the end, the authors share a set of conclusions and recommendations on the opportunity to transform tradition into a successful business.

Key words: *rice, production, import substitution policy, tradition, business.*

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INTELLECTUAL CAPITAL AS A FACTOR OF LOCAL GROWTH IN THE REPUBLIC OF CROATIA

Dragan Dokić[1], Vesna Gantner[2]

Abstract

This study explored the impact of human capital investments on local budget growth and economic development in Croatian local governments. By examining the connection between spending on education and local revenues, the research assesses how enhancing skills and knowledge in the population influences economic performance. Using data from Croatian local governments, the study compares the effects of investments in human capital—such as education and training—with other spending areas, like infrastructure and job initiatives. The findings reveal that investing in human capital has a strong positive impact on local budgets and economic development, often yielding more sustainable benefits than traditional infrastructure spending. Educated and skilled populations contribute significantly to economic activity and fiscal health. The study offers recommendations for local governments to prioritize education and training in their investment strategies to support sustainable economic growth, achieve better budget outcomes, and foster stronger community development in the long term.

Key words: *knowledge, intellectual capital, local government, local growth.*

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FARM MANAGERS IN AGRIBUSINESS OF THE EUROPEANUNION AND THE REPUBLIC OF SERBIA - COMPARATIVE APPROACH[1]

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

Abstract

Managers represent the most important human capital and play a driving role in the efficient development of economic entities and agricultural holdings in rural development. Research in the paper aims to analyze and identify positive and negative trends, similarities and differences in the farm managers structure in the European Union and the Republic of Serbia. Research has confirmed the basic hypotheses. The comparative analysis confirmed that the EU and Serbia share similar characteristics, challenges and problems when it comes to the degree of engagement of professional managers on farms. The involvement of professional managers is directly related to the size and income of the farm. Large farms, due to the volume of operations, to a greater extent hire professional managers in business management. Medium and small farms are faced with numerous challenges in terms of unfavorable age structure, migration, inadequate educational level, gender structure, legal status of employment. This indicates the need for further research in encouraging and giving stronger support to the role of professional management on farms with the aim of sustainable, efficient, effective and profitable business in agribusiness.

Key words: *farm managers, professional management, structure, agribusiness, agricultural holding*

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REPUBLIC OF MOLDOVA'S AGRICULTURAL SECTOR TOWARDS EU CAP: BUILDING RESILIENCE AND SUPPORTING SUSTAINABILITY

Eugenia Lucasenco[1], Alexandru Ceban[2]

Abstract

In the framework of the most recent evolution with respect to EU accession, the agricultural sector of the Republic of Moldova is to undertake important and specific steps for aligning the main policies to the UE provisions. Enhancing the resilience of the agri-food sector, especially in the current regional crisis situation, as well as due to the increasing effects of droughts, is very significant for its further progress and generation of added value for the national economy. Therefore, the paper aims to analyze the current stage of development of the agricultural sector of the Republic of Moldova and existing premises for its alignment with CAP provisions, by building the resilience and supporting the sustainable development of the sector. The article provides for conclusions that the agricultural sector of the country is on the correct path of development, with the recommendations to increase the awareness among farmers on adopting sustainable practices that are supported through targeted public support measures like subsidies and other development programs.

Key words: *agriculture, Republic of Moldova, resilience, sustainability.*

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COMPARATIVE STUDY ON THE COMPETITIVENESS OF ROMANIA'S AGRI-FOOD SECTOR IN THE EUROPEAN CONTEXT

Gabriel Mazilu Alexandru[1]

Abstract

This thesis addresses the competitiveness of Romania's agri-food sector within the context of the European economy, focusing on aligning Romanian agriculture with EU standards. It aims to analyze the current European framework and propose concrete measures to improve competitiveness. The study investigates how Romania's agri-food sector can achieve economic performance comparable to other EU countries. The main objective is to explore opportunities for enhancing competitiveness by adapting to new EU policies and increasing innovation. Chapter I provides a theoretical analysis of competitiveness and the agri-food sector, highlighting the impact of the post-2020 Common Agricultural Policy. Chapter II evaluates Romania's trade balance in the agri-food sector relative to other EU states. Chapter III proposes specific measures to improve competitiveness across various sub-sectors. Conclusions summarize key findings and offer recommendations for boosting competitiveness. The study is based on European and national statistics, presenting a development model suited to current economic realities.

Key word: *competitiveness, agriculture, innovation.*

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SUSTAINABILITY REPORTING IN TRANSITION: COMPARING EU AND WESTERN BALKAN PRACTICES

Gligorija Rnjak Punos[1], Goranka Knezevic[2]

Abstract

This paper presents an analysis of the evolving field of sustainability reporting, focusing on current regulatory requirements within the European Union (EU) and their practical application, both in force and set to take effect in the near future. It also examines non-EU countries and regions outside Europe, with a comparative analysis of the Western Balkans. The EU has significantly advanced its sustainability reporting framework, particularly through the Corporate Sustainability Reporting Directive (CSRD) and the European Sustainability Reporting Standards (ESRS). These regulations mandate comprehensive reporting on environmental, social, and governance (ESG) impacts, thereby aligning with the broader EU sustainability goals.

In contrast, non-EU countries, including those in the Western Balkans, face varying levels of adoption and implementation of sustainability reporting, influenced by their EU accession processes, the integration of local legislation with international frameworks, and efforts to ensure competitiveness in the EU and global markets. The analysis incorporates data from corporate reports and conferences within the Western Balkans to highlight the region's efforts in aligning with EU sustainability directives, the role of audit committees in ensuring compliance, and the readiness of local industries and companies to meet these standards.

The aim of this paper is to evaluate the current state of sustainability reporting across different regions, analyzing company involvement in sectors such as manufacturing, energy, and services. By examining regulatory and practical differences, the paper identifies challenges and opportunities for bridging the gap between EU standards and practices in the Western Balkans and other regions worldwide.

Keyw ords: *Sustainability Reporting, Corporate Sustainability Reporting Directive (CSRD), European Sustainability Reporting Standards (ESRS), Taxonomy Regulation, Non-Financial Reporting Standards (NFRD), Environmental, Social, and Governance (ESG) Goals, International Sustainability Standards (e.g., ISSB, GRI, SASB), EU Sustainability Goals, Western Balkan Region.*

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ANALYSIS OF THE POSSIBILITY OF FINANCING FROM THE IPARD 3 PROGRAM IN THE REPUBLIC OF SERBIA[1]

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

Abstract

Financial instrument for pre-accession assistance - IPARD 3 program, for the period 2021-2027, was adopted by the Decision of the Government of the Republic of Serbia on December 14, 2023. The total financial value of the IPARD 3 program amounts to 588 million euros, of which the contribution of the European Union is 280 million euros. The main goals of the IPARD 3 program are the following: increasing the competitiveness, efficiency and sustainability of agricultural production, improving the economic position of agricultural farms, rural development, stimulating the employment of young people in rural areas, contribution to the mitigating of the climate changes' negative effects, as well as building efficient public administration in the field of agriculture and rural development in the Republic of Serbia. As of October 2024, four out of a total of eight measures have been accredited. The aim of the paper is to present the current financing possibilities from the IPARD 3 program in the Republic of Serbia, as well as to compare them with the financing possibilities from the IPARD 2 program. The the paper there have been used the following methods: the method of analysis and synthesis, comparative method, as well as the methods of descriptive statistical analysis. The authors conclude that additional opportunities for financing agriculture and rural development in the Republic of Serbia are available within the IPARD 3 program compared to the IPARD 2 program.

Key words: *financing, agriculture, rural development, IPARD 3 program, accredited measures, Republic of Serbia.*

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ANALYSIS OF CRISIS SITUATIONS IN THE AGRI-FOOD SECTOR: CASE STUDY OF THE RUSSIA-UKRAINE WAR

Ioana Cristina Neagu [1]

Abstract

The Analysis of Crisis Situations in the Agri-Food Sector. Case Study: Russia-Ukraine war" is a topic that includes current events, events that affect us in a negative or positive way every day, often without us realizing it. Romania is clearly undergoing continuous change, just like most other countries, in every aspect: economic, social, and medical. For these changes to occur, a strong factor is always needed. Currently, Romania is struggling with inflation, a phenomenon that is evidently affecting the population. An important factor underlying the current inflation is the military conflict between Russia and Ukraine. Through their analysis, clear signs of the impact of the military conflict at the country's borders can be observed, such as the increase in prices of agri-food products, the reduction of areas cultivated with wheat and vegetables, and the decrease in demand for vegetables that have seen price increases.

Key word: *agri-food sector, crisis, Russia-Ukraine war.*

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CHALLENGES IN PROMOTING INNOVATION IN SERBIA'S AGRICULTURAL SECTOR

Isidora Beraha[1], Sonja Đuričin[2]

Abstract

This paper aims to provide recommendations for innovation policymakers to foster the development of innovations in Serbia's agricultural sector. It highlights the significance of agriculture as a key sector of the Serbian economy and emphasizes innovation's role in enhancing efficiency, competitiveness, and achieving sustainable agricultural production. A review of the state-of-the-art in agricultural innovation systems literature offers insights into current trends, effective approaches, and challenges. The overview of the current strategic and institutional frameworks affecting agricultural development in Serbia is provided, along with the analysis of the innovation ecosystem. Key challenges hindering innovation include establishing greater coherence between national agricultural objectives and the institutional environment, developing the agricultural innovation system—particularly partnerships among government, academia, producers, and civil society, and addressing financing challenges for the innovation process. The paper provides recommendations to overcome these obstacles, enabling better innovation implementation and sustainable agricultural development in Serbia.

Key words: *innovation, agricultural sector, innovation policy, innovation ecosystem, institutional environment, Serbia.*

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AGRICULTURE, ENERGY AND GREENHOUSE GAS EMISSIONS IN CONTEXT OF CLIMATE RESILIENCE TRANSITION

Jean Vasile Andrei[1], Luminita Chivu[2], Ovidiu Condeianu[3], Alina-Oana Chiva [4]

Abstract

The climate crisis has intensified the focus on agriculture and energy as key contributors to greenhouse gas (GHG) emissions. Agriculture is a significant source of methane and nitrous oxide, while the energy sector, largely reliant on fossil fuels, contributes heavily to carbon dioxide emissions. Reducing emissions from these sectors is determinant for a successful climate transition. While challenges exist, the sectors also present unique opportunities for innovation and synergies that can accelerate progress towards climate goals. Policies that support renewable energy, carbon sequestration, and low-emission technologies, combined with a commitment to addressing socio-economic impacts may represent a balanced and equitable climate transition. The main aim of the paper is to present, assess and identify the intersections of agriculture and energy within the climate transition, highlighting the challenges, opportunities, and solutions in achieving a sustainable, low-emissions future.

Key words: *agriculture, environment, energy, GHG emissions, climate transition*.

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THE ROLE OF INTERNAL AUDIT IN PROMOTING SUSTAINABLE DEVELOPMENT IN AGRICULTURAL ENTERPRISES

Jelena Gruslav[1], Miroslav Perić[2]

Abstract

This paper explores the role of internal audit in supporting the promotion of sustainable business development of agricultural enterprises, examining how the work of internal auditors and the timely identification of business risks helps the management and employees of these enterprises in achieving defined and sustainable business goals. The paper is based on a survey conducted among agricultural enterprises through a questionnaire, aimed at determining the efficiency and usefulness of the internal audit function in improving environmental, social and management standards. This research emphasizes the importance of internal audit as a corrective mechanism in assessing compliance and implementation of regulations and the quality of established processes in achieving sustainable development of agricultural enterprises, with the aim of improving their commitment to implementing sustainable practices in their operations. The results of the research highlight the need for internal audit, as an advisory activity, to be included in the definition of sustainability strategies in agricultural enterprises, in order to encourage long-term value creation in the agricultural sector.

Key words: *internal audit, sustainable development, agricultural enterprises.*

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THE EFFECT OF SUBSIDIES FROM THE AGRICULTURAL BUDGET OF THE AUTONOMOUS PROVINCE OF VOJVODINA ON INVESTMENTS IN AGRICULTURAL COOPERATIVES

Jelena Nestorov Bizonj[1]

Abstract

Agricultural cooperatives that have property and continuously invest in new capacities have the ability to provide a greater scope and quality of services to their members and cooperants in comparison to agricultural cooperatives that do not have property and investment conditions. The majority of agricultural cooperatives in Autonomous Province of Vojvodina do not have the ability to finance major investments in material assets from personal sources, and obtaining credit for investments is extremely unfavourable. Therefore, agricultural cooperatives require subsidies to undertake new investments. This paper will present the effects of past subsidies from the agricultural budget of the Autonomous Province of Vojvodina on investments in agricultural cooperatives, starting from the analysis of the availability of subsidies for cooperatives, concluding with the definitions for proposals for future incentives of better quality.

Key words: *agricultural cooperatives, subsidies, investments, property.*

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ECONOMIC ASSESSMENT OF INVESTMENTS IN RURAL INFRASTRUCTURE IN MOUNTANIOUS AREAS[1]

Jonel Subić[2], Marko Jeločnik[3], Mladen Petrović[4]

Abstract

As one of the important elements of rural infrastructure, water supply represents the major precondition of modern lifestyle. However, in hilly-mountainous regions of Serbian rural areas, water supply still does not have the treatment it deserves, while is not in line with the concept of sustainable development. Due to mentioned, there is a need for prompt attention to the issue of fresh water supply, while approach has to be in a planned manner, respecting both professional aspects, and all three pillars of sustainable development (economic, environmental and social). Considering that in hilly-mountainous areas there are still local communities that have existed for many years without centralized or public water supply system, rural settlements are usually forced to rely on individual water supply solutions. Simultaneously with social progress, as well as towards the general increase in "urbanization" of villages, this issue is indispensably linked to overall development.

Author's research is focused on finding quality (technical) alternatives that secures the quality of fresh water, with special emphasis on economic assessment of investment in establishment of centralized water supply system. Preset economic model assumes overall investment of 1,843,589.74 EUR, or investment in fixed assets of 1,691,025.64 EUR, and investment in permanent working capital of 152,564.10 EUR. Applying the dynamic methods for evaluation of economic effectiveness of investments, there were derived next results: Net Present Value of 4,129,742.47 EUR, Internal Rate of Return

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of 87.59%, and Payback Period of 10 years and 1.53 months. Considering planned exploitation period of investment (30 years) and occurred discount rate (7%), there could be concluded that in economic sense the investment is fully justified, while the local rural community could expect achieving of significant profit by its further utilization.

Key words: *Rural areas, hilly-mountainous areas, water supply system, sustainable development, economic effectiveness of investment, Serbia.*

IMPACT OF ENVIRONMENTALLY RELATED TAXES ON REDUCING POLLUTION IN AGRICULTURAL SECTOR

Larisa Jovanović[1], *Suzana Balaban*[2]

Abstract

The authors analyze an impact of the environmentally related (ERL) taxes on reducing pollution in the agriculture sector in Serbia. The obtained results show a strong positive correlation between carbon dioxide emissions and ERL taxes implying that these taxes are not effective in case of carbon dioxide emissions. A strong negative correlations exist between non-methane volatile organic compounds emissions and ERL taxes, between sulfur oxides emissions and ERL taxes, between particulate matter <10 μm *emissions and ERL taxes, and between carbon monoxide emissions show and ERL taxes, further indicating that the observed variables move in opposite directions with a strong association. Bearing in mind the obtained findings, the authors may conclude that the ERL taxes in the agriculture sector are relatively effective.*

Key words: *Environmentally Related Taxes, Air Pollution, Greenhouse Gases Emission, Correlation, Agricultural sector.*

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AUTONOMY OF WILL AND DISPOSAL OF AGRICULTURAL LAND[1]

Ljiljana Rajnović[2], Snežana Cico[3]

Abstract

Autonomy of the will is the basic principle of the law governing the matter of contract law. The autonomy of the will is a confirmation of the existence of subjective civil rights, but also a guarantee of the position and role of the will of the individual in the establishment, change and termination of subjective civil rights. This would mean that the contracting parties conclude, change and terminate their contractual relations of their own free will. The widest freedom of contract exists when the object of disposal is private property. However, this freedom is not limitless, but must be within the limits of coercive regulations, public order and good customs, which limits are quite wide depending on the subject of the contract. Certain restrictions exist in the disposal of agricultural land. The paper analyzes the influence of autonomy of will on the disposal of agricultural land in private ownership. On the one hand, agricultural land is an asset of general interest in the Republic of Serbia, and on the other hand, there are general rules of freedom of disposal of private property, but this freedom is limited in specific cases, considering the status of an asset of general interest. Autors believe that the state benefits from goods of general interest and the owner bears the risk. That is why the state should make an additional contribution, by reducing the risk of agricultural land owners with safe subsidies so that both parties benefit.

Key words: *autonomy of will, agricultural land, good of general interest, restrictions on disposal, natural law.*

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ANALYSIS OF ENVIRONMENTAL EXPENSES IN ROMANIA AND SERBIA

Baicu Maria Claudia[1]

Abstract

This discussion encompasses "Analysis of environmental expenses in Romania and Serbia", reduction of greenhouse gas emissions, and carbon footprint. The analysis of ecological spending in Romania focuses on assessing the costs associated with environmental protection and natural resource management, including government spending, private sector investments, and European funds allocated for ecological projects. Romania has implemented various policies to improve resource management in alignment with sustainable development objectives. Studies on these expenditures examine their impact on the economy and society, as well as the efficiency of fund utilization in environmental projects.

Key words: *emissions, environmental expenses, carbon footprint.*

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MARKETING RESEARCH ON CONSUMER'S PREFERENCES FOR CHOCOLATE

Maria Carina Grosu[1], Bogdan Alexandru Răţeacă[2], Ştefan Amuza Ionuţ[3]

Abstract

The study explores various approaches to marketing research and their role in developing effective strategies. It analyzes how marketing research aids in understanding consumer needs and expectations within the dynamic chocolate market. Key marketing research frameworks are examined, highlighting their significance in uncovering both overt and latent consumer needs. Focusing specifically on the Romanian chocolate market, the research evaluates current supply and demand while investigating the economic, socio-cultural, and individual factors that influence consumer behavior. Additionally, a case study on consumer preferences delves into the impact of pricing, branding, packaging, and advertising on purchasing decisions. The findings provide valuable insights that can inform more effective marketing strategies and enhance alignment with evolving consumer expectations in this competitive landscape.

Key words: *marketing research*, *chocolate market, consumer preferences.*

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THE ROLE OF NON-REFUNDABLE EUROPEAN FUNDS IN INCREASING THE EFFICIENCY OF THE AGRI-FOOD LOGISTICS SYSTEM

Mihai Cătălin Maxin[1], Emanuel Georgian Ruică[2], Andrei Alin Miruță[3]

Abstract

Logistics, originally a military concept, has evolved to become a fundamental aspect of many sectors, including agriculture and food production. This article will explore the historical roots and contemporary applications of logistics, pointing to its crucial role in increasing efficiency and competitiveness. Through a comprehensive analysis of military studies and academic papers, it examines the complex character of logistics and its impact on operational effectiveness. The article also analyzes the evolution of logistics from the military to the civilian domain, pointing out its importance in modern business operations, particularly in supply chain management. In addition, it addresses the challenges and opportunities related to logistics in the agri-food sector in Romania, underlining the crucial role of European Union funds in supporting its development. By clarifying key principles and strategies, this article provides insights into how logistics can be used to improve competitiveness and sustainability in the agri-food sector.

Key words: *logistics, EU non-reimbursable funds, agri-food.*

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STRENGTHENING RESILIENCE IN AGRICULTURE: STRATEGIES FOR NATURAL, ECONOMIC AND EMERGENCY DISASTERS

Mirjana Dejanović[1]

Abstract

Resilience in agriculture is increasingly vital due to the growing frequency of natural and economic disasters, as well as emergencies that threaten food production. Climate change, economic instability, and global crises like pandemics and political unrest pose significant risks to agricultural systems worldwide. This paper examines strategies to enhance agricultural resilience, including adaptation to droughts, floods, and extreme weather events. Key measures include using resilient plant and animal varieties, soil conservation methods such as cover cropping and crop rotation, and implementing smart irrigation systems. Economic challenges like price fluctuations and market shifts are addressed through income diversification and flexible supply chains, supported by governments and international organizations. In emergencies, innovations like satellite monitoring and drones aid in early risk detection and response. The paper stresses the importance of education, training, and networking among farmers, along with an integrated approach that combines innovation, policy, and education.

Key words: *resilience, agriculture, climate change, economic crisis, innovation, emergencie.*

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DEVELOPMENT OF LOGISTICS AND SUPPLY CHAIN IN AGRIBUSINESS[1]

Miroslav Nedeljković[2], Adis Puška[3], Slađana Vujičić[4], Velibor Potrebić[5]

Abstract

The paper is based on the conceptual definition of logistics and supply chain in agribusiness. Recently, due to the complexity of the supply process, as well as the specifics of agricultural production, the analysis of the supply chain in agro business is gaining importance. The paper tries to use a descriptive method to explain the difference between logistics as a concept and the supply chain, and to explain their role in agribusiness. In their earlier research, many authors dealt with individual parts of the supply chain in agriculture and agribusiness, and presented their work with the difficulties and advantages that exist within it. The results show that logistics is a narrower concept than the supply chain, i.e. that it represents one part of it, and that the complexity of the process is due to the peculiarities of the agricultural products themselves as an indispensable part of agribusiness. The greatest contribution is reflected in the presentation of potential difficulties that may arise in the process of functioning of the supply chain in agribusiness, and the advantages that arise due to efficient functioning.

Key words: *Supply chain, Agribusiness, Logistics, Agriculture, Suppliers, Consumers.*

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ASSESSING THE MANAGERIAL CAPACITIES OF MILK PRODUCERS IN TITEL MUNICIPALITY

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Abstract

Farmer managerial capacities can be defined as "possessing appropriate personal characteristics and ability to cope with certain problems and opportunities, in the right way and at the right time." Considering the significance of managerial capacities and the problematic state of the milk production sector, and the pressing need to boost its competitiveness, this study investigates the managerial capacities of milk producers in the Titel municipality, located in AP Vojvodina. The decision to analyze milk producers in Titel municipality is based on its higher-than-average number of milking cows compared to the national average in Serbia, leading to a substantial level of milk production. The objective of this study is to assess their managerial capacities, focusing on personal traits, skill sets, and the decision-making process. Following the identification of the producers' managerial profiles, the study proposes specific recommendations aimed at enhancing these capacities to foster greater competitiveness in milk production. The research included a survey of 60 milk producers. Data analysis, carried out using the SPSS software package, indicates that in addition to implementing strategies for improving milk yield and adopting advanced biotechnologies, strengthening managerial capacities, particularly in decision-making, is essential.

Key words: *managerial capacities, milk production, Titel municipality.*

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IMPLEMENTATION OF THE HACCP STANDARD IN DOMESTIC DAIRY INDUSTRY

Radivoj Prodanović[1], Nebojša Kojić[2], Aleksandra Pavlović[3]

Abstract

The aim of the research was to understand the nature and implementation of the HACCP standard and identify accompanying issues in domestic dairies. Interviews were conducted with representatives of HACCP working groups from five dairies, as well as with a representative from the Food Safety Council. The results showed that all dairies have HACCP working groups, product descriptions, and production schemes, which are significant for food safety. The dairies met the HACCP standard requirements in terms of hazard analysis. Dairy D's HACCP plan is not compliant with the standard's requirements, while other dairies have specified CCPs and critical limits. All dairies keep records, although Dairy D reported deficiencies in monitoring sheets. If there is a deviation from the critical limits, immediate action is taken, and the situation is brought under control. Internal audits of the HACCP system are conducted at least once a year, and any identified deficiencies are documented. All dairies have implemented prerequisite programs and developed food traceability systems. The problems faced by domestic dairies were identified, with the most significant being the lack of risk management software, inadequate training, the introduction of overly strict laboratory requirements, among others. In terms of prerequisite programs, dairies mainly faced structural and technical issues, as well as problems with health inspections. Dairy D had issues with product recalls. Problems with the implementation of the HACCP standard also arise during product export, where regulations are significantly stricter. The effective application of the HACCP standard depends on management commitment, prerequisite programs, and training.

Key words: *HACCP standard, food safety, dairy industry.*

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THE ANALYSIS OF THE TRADE BALANCE OF ROMANIA AND SERBIA

Simona Roxana Pătărlăgeanu[1], Andreea Apetrei Kalveram[2], Alina Florentina Gheorghe[3], Maria Ioana Urs[4]

Abstract

This paper offers a comparative analysis of the trade balance of Romania and Serbia, highlighting the main trends, differences, and economic challenges faced by both countries in the current global context. The study examines the evolution of exports, imports, trade deficits, and surpluses in recent years, with a focus on dominant economic sectors and the influence of trade policies. In addition, the paper includes a bibliometric analysis of the specialized literature on the trade balance, exploring the frequency, relevance, and trends in research on this topic. Thus, the main research directions and theoretical frameworks used to understand this subject in Romania and Serbia are identified. The paper also discusses the impact of the European Union on Romania's trade balance and the prospects for Serbia's regional integration. It provides an integrated perspective on the economic and academic factors contributing to the trade performance of both countries, highlighting future opportunities and risks.

Key words: *trade balance, Romania, Serbia, exchange, bibliometric analysis*

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CHALLENGES AND OPPORTUNITIES IN THE TRADITIONAL FOOD PRODUCTS MARKET: A COMPARATIVE ANALYSIS BETWEEN ROMANIA AND THE BALKANS

Stefan- Robert Simon[1]

Abstract

The paper examines the traditional food products market in Romania, drawing comparisons with the broader Balkan region. It addresses key challenges such as regulatory hurdles, changing consumer preferences, and the role of rural development programs. Through a comparative approach, the study identifies both barriers to market entry and opportunities for growth, particularly through enhanced branding and certification. The analysis suggests that improved market differentiation and collaboration across borders could significantly strengthen the position of traditional food products. The paper concludes with policy recommendations aimed at supporting rural economies and facilitating greater market access.

Key words: *market, traditional food products, Romania.*

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STUDY ON OPPORTUNITIES FOR RECOVERY OF WASTE AND BY-PRODUCTS FROM THE CEREAL SECTOR

Steliana Rodino[1], Ancuța Marin[2], Laura Contescu[3], Daniela Voicila[4]

Abstract

The cereal sector is considered one of the most important sectors in agriculture and food economy. Major cereal crops, like wheat, maize, and rice, provide the food base for much of the world's population and are used for animal feed and industries such as bioethanol and biofuel production. The waste and by-products from this sector (straw, husks, and bran) can be used in circular system for closing the materials loop. The valorization avenues include production of biogas, bioethanol, compost, animal feed, and biodegradable material. The national and international legislative framework supports efficient management and recycling of agricultural wastes with a view to sustainable development and environmental protection. In this context, this article is providing a review of the importance of the cereal sector in the world agricultural context, highlighting the dual function of ensuring food security and the possibility of recovering cereals' waste in a sustainable way by integration into a circular economy process.

Key words: *circular economy, cereals, byproducts.*

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CIRCULAR SKILLS IN AGRICULTURAL RESOURCE MANAGEMENT

Tatjana Stevanović[1], Maja Ivanović Đukić[2]

Abstract

The transition to a circular economy requires a re-evaluation of traditional supply chain practices. Circular skills in supply chain management include optimizing material flows, implementing reverse logistics, and fostering collaboration among stakeholders. Circular challenges are inherently complex and require collaboration across disciplines. Interdisciplinary competence is a key circular skill that bridges the gap between different fields of knowledge. Efficient resource management is at the core of the circular economy. Circular skills in resource management include effective waste reduction, recycling strategies, and the adoption of circular business models. Agricultural production processes play a key role in determining the sustainability of products. Circular skills in agricultural production include resource efficiency, waste reduction, and the adoption of circular production techniques. The aim of this paper is to explore the role of circular skills in reshaping agricultural production practices and ensuring a more sustainable agricultural landscape.

Key words: *circular skills, resource management, agricultural production*

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ENVIRONMENTAL PERFORMANCE OF AGRICULTURE IN SERBIA AND POLAND[1]

Vesna Paraušić[2], Bojana Bekić Šarić[3], Iwona Pomianek[4]

Abstract

The aim of this paper is to present the achieved level of national economies' environmental performance, especially of the agricultural sector, for two countries: Serbia (non-EU country) and Poland (EU country). The analysis was based on the Environmental Performance Index (abbreviated EPI) reports and covered the period 2020-2024. According to the 2024 EPI, Serbia is ranked at the 64th place in the world, in terms of national environmental sustainability, while Poland is in a better position, at the 19th place. When it comes to the agriculture, according to the 2024 EPI, Serbia is at the 26th place, with the best result in sustainable nitrogen management, and the worst result in pesticide pollution risk. Comparing to Serbia, the ecological performance of Poland's agriculture is more unfavourable, considering that it is ranked at 35th place, with the best result in sustainable nitrogen management, and the worst result in regarding phosphorus surplus.

Key words: *environmental performance index, agriculture, Serbia, Poland.*

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ECONOMIC PROFITABILITY OF ŠUMADINKA SOUR CHERRY PRODUCTION ON A FAMILY FARM[1]

Vladimir Zdravković[2], Bojan Dimitrijević[3], Zoran Rajić[4]

Abstract

The subject of this work is the analysis of the characteristics and production results of the Šumadinka sour cherry, which is intended for fresh marketing. The main goal of the work is to determine the economic profitability of the production of this cherry variety on the family farm (FF) located in the Rasina district. The description method, the calculation method and the interview method were used in the preparation of the paper. The research was conducted on the basis of data collected on the farm itself, and the database of the Statistical Office of the Republic of Serbia (RZS) and the Food and Agriculture Organization (FAO), as well as relevant scientific and professional literature, was used. The analysis showed that the production of sour cherries, the Šumdinka variety, on a family farm can be economically profitable.

Key words: *sour cherry, šumadinka, economic profitability.*

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METHODOLOGICAL FRAMEWORK FOR ASSESSING THE IMPACT OF CLIMATE RISK ON AGRICULTURAL PRODUCTION THROUGH THE VULNERABILITY INDEX IN SERBIA

Zoran Tomić[1]

Abstract

Climate change is one of the most critical challenges facing humanity on a global scale with a major impact on the ecosystem and people's way of life. Agriculture is a sector on which climate change has a significant impact, as it is one of the key sources of livelihood in most countries in the world, including Serbia. As a result of climate change, extreme natural events occur, such as floods, droughts, hail, strong winds, which lead to significant economic costs and damages in the agricultural production process. Such events can threaten the survival of farmers and bring them to the brink of poverty, but also endanger the food supply. This paper describes the index of vulnerability of agricultural production in Serbia due to the risk of climate change, which in its analysis takes parameters that describe the exposure, sensitivity and adaptability of agricultural production with the aim of better understanding the impact of climate change on agricultural production, as a tool for better development of future agricultural protection strategies of production from the mentioned risks which can be adaptation strategies and reduction strategies.

Key words: *vulnerability, sensitivity, exposure, adaptability, agriculture.*

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II SECTION - BIOTECHNOLOGY

TWO MODES IN NUTRITION OF COMMERCIAL ISA BROWN HENS AS FACTOR OF EGG PRODUCTION AND QUALITY

Aleksandar Miletić[1], Mihailo Radivojević[2], Jordan Marković[3], Jelena Milanović[4], Mladen Popovac[5], Biljana Anđelić[6]

Abstract

In order to find out effect of hens feeding once and twice daily, on egg production and quality, the experiment was performed on a sample of 120 birds, for 62 days. Two groups of hens were formed, experimental and control, both equalized regard age and egg production. Hens in experimental group were fed once daily, and twice in control group. Differences between groups were not statistically significant for the average feed consumption, egg production, egg size (weight, height, width), inner egg weight and yolk weight ($p>0.05$). Egg whites weight, as well as the shell weight, was statistically significantly very higher in hens fed twice in a day, compared to those fed once ($p<0.01$). The weight of egg whites was 38,07 g and 36,27 g in experimental and control group, respectively, while the shell weight was 8,71 g and 8,13 g in same order.

Key words: *feed consumption, egg production, egg quality*.

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PERMACULTURE AND REGENERATIVE AGRICULTURE

Alexandra Marin[1]

Abstract

This paper examines the concepts of permaculture and regenerative agriculture, highlighting their importance for sustainable agriculture and environmental conservation. Definitions and fundamental principles of permaculture and regenerative agriculture are discussed, as well as methods of implementing these practices in various ecological and social contexts. The paper addresses the benefits of permaculture and regenerative agriculture, such as improving soil health, increasing biodiversity and reducing negative environmental impacts. A case study demonstrating the success of permaculture and regenerative agriculture systems in a community is also presented. The conclusions emphasize the need to adopt integrative and collaborative approaches to promote a sustainable future through these two alternatives for traditional agriculture.

Key words: *permaculture, regenerative agriculture, sustainable, soil.*

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GENETICALLY MODIFIED CROPS IN THE CONTEXT OF FOOD AND CLIMATE CRISES: A BIOTECHNOLOGICAL SOLUTION FOR SUSTAINABILITY

Alin-Florin Dană[1], Cosmin Marius Streche[2], Eray Kan Karadogan[3]

Abstract

New possibilities in agriculture have been accessible by biotechnological engagement with crop development. Biotech-agriculture is essential to achieving the goals set by the Millennium Development Goals of the Sustainable Development Agenda. By reducing the losses and boosting results while using fewer pesticides, biotech crops have already made a small contribution to guaranteeing food and nutrition security. Some of the main issues facing agriculture based economies brought on by climate change projections, crops will face more abiotic stress-related difficulties as a result of rising greenhouse gas emissions, environmental aridization, abrupt and frequent temperature swings, and altered rainfall patterns in both space and time. In order to overcome obstacles and meet the food needs of the world's growing population, which is predicted to reach 9 billion people by 2030, we must create and employ biotech crops that can reduce the negative effects of climate change, make them resilient to harsh environmental conditions, address to concerns and non-issues brought up by non-governmental organizations, and inform the general public about the advantages of biotech crops.

Key words: *agriculture, climate, stress, temperature, resilience.*

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ECONOMIC ASPECTS OF THE RECIRCULATING AQUACULTURE SYSTEM FOR RAISING OF RAINBOW TROUT

Ana Butcaru, Carmen Gabriela Constantin, Aurora Dobrin, Ion Certan, Ionela Mițuco Vlad[1]

Abstract

Nowadays, people face many challenges related to climate change and food security. These challenges and scarce resources compel us to find new approaches to food production systems and business practices.

A recirculating aquaculture system (RAS) is a highly efficient method of fish farming that enables the sustainable production of aquatic organisms through the continuous recycling of water in a closed-loop environment.

One potential assessment tool for effectiveness evaluation and economic impact is the Life Cycle Cost Assessment (LCCA), which includes goal setting, system definition, system boundaries, functional cost unit (FCU) identification, determination of critical cost parameters, and cost calculations based on average values.

This study presents a detailed analysis of the costs of raising rainbow trout in a specific recirculating aquaculture system (RAS). It will provide conclusions and recommendations based on various analytical scenarios.

Key words: c*ircular economy, life cycle cost assessment, recirculating aquaculture system, waste management, rainbow trout.*

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EXAMINING THE MULTISCALE INTERRELATIONSHIP BETWEEN ETHANOL AND AGRICULTURAL COMMODITIES[1]

Boris Kuzman[2], Dejan Živkov[3], Andrea Andrejević Panić[4]

Abstract

This paper investigates the multiscale interdependence between ethanol and three agricultural commodities—corn, wheat, and soybeans—used as feedstocks for ethanol production. Two wavelet approaches are applied in the analysis: wavelet coherence and wavelet cross-correlation. The first method reveals the strength of the connection, while the second indicates the leading (or lagging) interconnection between assets. According to the wavelet coherence results, the link between ethanol and agricultural commodities is relatively weak in the short term but progressively strengthens as the time horizon increases. In the short-term horizon, the strongest link is observed between ethanol and corn. Wavelet cross-correlation indicates that the short-term connection is only relevant for ethanol and corn due to their relatively strong short-term relationship. Conversely, all long-term interdependencies are relevant since strong correlations are found at higher wavelet scales. According to the results, larger agricultural markets tend to lead the smaller ethanol market in most cases.

Key words: *ethanol, multiscale interlink, wavelet methodologies.*

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SUNFLOWER RESTORERS OF FERTILITY OBTAINED BY APPLYING INTERSPECIFIC HYBRIDIZATION AND EMBRYO CULTURE

Daniela Valkova[1], Nina Nenova[2]

Abstract

Interspecific hybridization was successfully applied between cultivated sunflower lines (Helianthus annuus L.) and accessions of annual species Helianthus neglectus, and perennial species H. decapetalus. The embryo cultivation method was used to overcome post-zygotic hybrid incompatibility and realize sufficient number of seeds. Some morphological, phenological and biochemical characters of hybrid forms were investigated. The degree of crossability was determined. As a result of self-pollination, sib-pollination and backcrossing F_2 and BC_1 generations were obtained. Lines NEG 2 and NEG 5, originated from wild annual H. neglectus were characterized with high seed oil content and resistance to broomrape. Lines DEC 1 and DEC 7 were distinguished with resistance to foliar pathogens and to the parasite broomrape. The hybrid plants, carriers of Rf genes for CMS Pet 1 could be used in sunflower breeding programs for developing new restorer lines. The obtained various lines are suitable initial material to extend the diversity of sunflower germplasm.

Key words: *Helianthus neglectus, Helianthus decapetalus, embryo rescue.*

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INFLUENCE OF BIOSTIMULATORS BASED ON MINERALS Ca, Mg AND B ON THE MORPHOLOGICAL CHARACTERISTICS OF PEPPER

Dejan Cvikić[1], Jelena Stoiljković[2], Ivan Tupajić[3], Marija Bajagić[4], Milan Ugrinović[5], Bojana Gavrilović[6], Biljana Šević[7]

Abstract

Application of biostimulators containing natural minerals for plant nutrition is increasingly taking place in sustainable production. The experiment was set up in 2024 in the greenhouse of the Institute for Vegetable Crops Smederevska Palanka. The tested varieties were Morava and LPK 12. The aim of the research is the influence of biostimulators based on Ca, Mg and B on the morphological characteristics of pepper fruits. The biostimulator was applied in the amount of 20 g per 10 l of water, according to the number of applications (T1 - 1x application, T2 - 2x, T3 - 3x) every 10 days. The highest fruit weight was measured in T1 in both varieties (Morava 69.80 g, LPK 12 193 g) compared to the control. The most fruits were in T3 (Morava 12.3, LPK 12 which is more than the control by 8.84% (Morava 11.3) and by 35.13% (LPK 12 3.7).

Key words: *biostimulator, minerals, morphological characteristics, pepper fruit.*

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CORRELATION ANALYSIS OF STRUCTURAL ELEMENTS IN DIFFERENT OILSEED SUNFLOWER HYBRIDS TREATED WITH HUMAT ROST PREPARATION

Georgi Georgiev[1]

Abstract

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. (Chandirakala et al., 2015). 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. Singh et al. (2018) found that yield was significantly affected by 100-seed mass, seed mass per plant, seed diameter, growing season % oil. Correlation describes the mutual relationship between variables and helps to improve different features simultaneously. An attempt was therefore made to estimate a correlation between yield and yield components. HumateRost increases yields, strengthens the root system of plants, increases their immunity and resistance to disease and weather, supports the process of photosynthesis. Plants are better adapted to adverse climatic conditions and herbicide treatments, are resistant to disease, stress and pests.

Key words: *vegetation, sunflower, yeld, plant height, head diameter, corellation.*

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VINEYARD AND TABKE GRAPE SECTORS ACCELERATING EU INTEGRATION OF THE REPUBLIC OF MOLDOVA

Ion Certan[1]

Abstract

The presence of the vine on the current territory of the Republic of Moldova is attested from the earliest times, which is confirmed by multiple archaeological studies, including the presence of the trace of the seed of the vine found on a ceramic shard dated to the middle of the 4th millennium BC found in the town of Rusestii Noi, Ialoveni district. Over the years, the development of vine plantations in our country has been considerably influenced by the development of the Ottoman and Russian empires, available resources, social factors and wars, especially the Second World War. According to the 1945 census, the area of vine plantations was 98.5 thousand hectares. Until the 90s of the last century, the main consumer of grapes and wine was the Russian Federal Republic, where about four fifths of the respective production from the Moldavian Soviet Socialist Republic was sold. After the declaration of independence (August 27, 1991), the legal framework of bilateral relations between the Republic of Moldova and the European Union was established. The Partnership and Cooperation Agreement (APC), signed on November 28, 1994, established the legal framework for relations in the political, economic, cultural-scientific field and had as its objective the support of the Republic of Moldova. In 2014, the APC was replaced by the Association Agenda, modified in August 2017, a new Association Agenda for the period 2017-2019 was approved. In March 2022, the Republic of Moldova applied for EU membership and in June of the same year it was granted the status of a candidate country. In December 2023, EU leaders decided to open accession negotiations. Undeniably, the negotiations will also focus on adjusting the national economy, including viticulture, to the requirements of the European Union. In this context, the author of the article, based on the analysis of the evolution of the development of vine plantations which in 2022 covered an area of 116.5 thousand hectares, including 17.6 thousand ha planted with table varieties, comes up with some proposals that would contribute to the adjustment of this segment of the national economy to the requirements of the European Union.

Key words: *vine, wine, policies, development, resources, analysis, efficiency.*

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COMPARISON OF NDVI INDEX IN VINE WITH THE APPLICATION OF DIFFERENT CHEMICAL TREATMENTS [1]

Irina Marina Stević[2], Biljana Bošković[3], Danijela Živojinović[4], Nevena Stevanović[5], Nikola Stanković[6], Maša Buđen[7]

Abstract

This paper investigates the impact of various chemical treatments (organic and conventional) on the values of the NDVI index (Normalized Difference Vegetation Index) in grapevines. NDVI is used as a reliable indicator of plant health and vitality. By analyzing vegetative changes, it allows for the identification of differences between protection methods. The research included an analysis of a vineyard treated with organic and conventional preparations at two intervals after spraying. The results showed that the index values in areas treated with the organic preparation 30 days after spraying had high values. This finding suggests that the application of organic treatments plays multiple roles, contributing to sustainable agriculture while also impacting fruit quality. Therefore, the application of the NDVI index can be highly beneficial in assessing the effectiveness of different chemical treatments used in vineyards, thereby positively influencing vineyard management strategies.

Key words: *vegetation indices, NDVI index, vines, organic, conventional.*

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FUSARIUM SPP. ASSOCIATED WITH ONION (*ALLIUM CEPA* L.) ROT

Maja Ignjatov[1], Dragana Milošević[1], Slobodan Vlajić[1], Gordana Tamindžić[1], Dragana Miljaković[1], Vukašin Popović[1], Milka Brdar Jokanović[1]

Abstract

Onion (Allium cepa L.) is a cultivated vegetable plant grown in Serbia mostly for fresh use and as a component for industrial food production. A wide occurrence of onion rot caused by Fusarium spp. has been observed in many vegetable-growing areas worldwide. The aim of this research was to identify the causative agents of onion rot on samples collected from different localities in the Serbian agroecological region of Bačka. All isolates were divided into four groups based on the morphological features of fungi grown on PDA and CLA. Identification was confirmed by DNA sequencing of the TEF 1-α gene. BLAST analysis (NCBI GenBank) confirmed the identity of F. proliferatum, F. oxysporum f.sp. cepae, F. tricinctum, and F. verticillioides. The results of this study showed that different Fusarium species were responsible for onion rot which is base for further analysis of onion resistance, mycotoxins, and protective measures.

Key words: *Fusarium spp., onion rot, Allium cepa L.*

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STATE OF VEGETABLE ORGANIC PRODUCTION IN THE REPUBLIC OF SERBIA[1]

Marijana Jovanović Todorović[2], Lana Nastić[3], Vera Popović[4]

Abstract

The areas under organic crop production in Serbia in 2021 amounted to 23,527 ha and were 12.2% higher compared to 2020.The largest areas in 2021 were under organic fruit production - 36%, under cereals - 28%, fodder plants - 19%, while the smallest land was planted and sown with vegetables, medicinal and herbs. Looking at regions, organic production was most represented in Vojvodina, where these areas accounted for 38.36%, followed by the region of Southern and Eastern Serbia with a share of 31.58%. Vegetable organic production in Republic Serbia has been gaining traction in recent years, driven by increasing consumer demanding for organic products and growing awareness of sustainable farming practices. Serbia has estrablished regulations for organic farming that aligh with EU standards, allowing producers to access both local and international markets. Serbia's diverse climate and fertile soil provide a good foundation for organic vegetable production. Farmers are increasingly adopting practices such as crop rotation and integrated pest management. Local markets, supermarkets, and export opportunities are expanding for organic products, supported by initiatives aimed at promoting Serbian organic goods. Farmers face challenges such as transitioning from conventional to organic practices, pest management, and market competition. The organic vegetable sector in Serbia shows promise for growth, contributing to both the local economy and environmental sustainability.

Key word: *Vegetable, Organic production, Republic of Serbia.*

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PRODUCTION OF MEDICINAL AND AROMATIC HERBS IN ACCORDANCE WITH SUSTAINABLE DEVELOPMENT OF AGRICULTURE IN SERBIA

Nada Mijajlović[1]

Abstract

The production and processing of medicinal and aromatic plants in Serbia represents a development opportunity within the context of sustainable agricultural development. In this sense, Serbia has very good geoclimatic conditions and a large number of medicinal and aromatic plants that are successfully cultivated or have grown wild in different regions. The collection and cultivation of medicinal plants has its own long tradition in folk medicine. Planned plantation cultivation of medicinal species can be achieved on relatively small areas with organized and secure market placement, providing a return on investment in production with solid profits. In the context of diversification of agricultural production at the level of agricultural holdings in Serbia, incentives for the production of medicinal plants are provided. The aim of this paper is to point out the capacities and production capabilities of Serbia in terms of medicinal and aromatic plants. The paper analyzes the assortiment of medicinal and aromatic herbs and their purchase prices on the domestic and foreign markets.

Key words: *medicinal and aromatic herbs, agricultural sustainable development.*

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EFFECT OF BREED AND BREEDING DISTRICTS ON THE REDUCTION OF MILK PRODUCTION IN COWS DURING HEAT STRESS

Nenad Mićić[1], Dragan Stanojević[2], Ljiljana Samolovac[3], Dragan Nikšić[4], Mirna Gavran[5], Vladan Bogdanović[6], Vesna Gantner[7]

Abstract

Global warming and rising air temperatures are expected to directly affect summer milk production in dairy cows across Europe, particularly in regions with high dairy cattle concentrations. The impact on milk production may vary widely, as cows respond differently to environmental changes. They adapt more easily to favorable conditions but struggle with sudden stressors. This paper reviews the climatic influences on milk production and cow behavior under heat stress, categorizing impacts into indirect long-term effects and direct short-term effects. Economic losses in milk production can be assessed using the milk prediction decline (MPD) feature, demonstrated for four cow breeds in three districts of Serbia.

Key words: *air temperature, global warming, milk production, cows, breed.*

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INFLUENCE OF NUTRITION ON THE NUMBER OF LEAVES, THEIR AREA AND ROOT WEIGHT OF SUGAR BEET [1]

Radmila Bojović[2], Vera Popović[3], Marijana Jovanović Todorović [4]

Abstract

Sugar beet is a plant that has been a part of our daily diet for centuries *because it has been cultivated as a garden plant for 3000 years. It is mostly grown in the temperate climates of Europe and Asia. Sugar beet is a plant from which sugar - sucrose - is obtained from its roots. All parts of sugar beet are useful: root, head, leaves. Considering that the main reason for cultivation is the root, the leaves remain unused in further processing and are used mainly for animal feed. What should be emphasized is that these leaves have the potential to be used further in the food and chemical industries because they contain a large amount of protein and polyphenols. Therefore, more attention should be paid to the study of factors that would contribute to the growth of not only the roots but also the leaves of sugar beet. This paper dealt with the influence of different amounts of NPK on the number and surface area of leaves and the weight of roots in two sugar beet varieties - Original and Ventura. The experiment was carried out on the fields of PIK Tamish, it lasted two years and the impact of 9 combinations of NPK was tested and the tenth was the control. The variety Original had the highest average number of leaves at* $N_{100}P_{50}K_{50}$ *and* $N_{130}P_{50}K_{50}$ *in the first year and at* $N_{130}P_{100}K_{100}$ *in the second year (25.9) and Ventura at* $N_{100}P_{100}K_{100}$ *in the first year (34.2) and at* $N_{50}P_{50}K_{50}$ *and* $N_{130}P_{100}K_{100}$ *(33.6). The highest average leaf area was for the Original variety in both years at* $N_{130}P_{50}K_{50}$ *(7493.17 cm2; 7501.12 cm2) and for the Ventura variety at* $N_{100}P_{100}K_{100}$ *(9805.59cm2; 9846.96 cm2). The highest average root weight in the Original variety was* $N_{130}P_{130}K_{130}$ *(1kg) in the first year, and* $N_{100}P_{50}K_{50}$ *(0.99kg) in the second year.*

Key words: *Sugar beet, number and area of leaves, weight of roots.*

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APPLICATION OF CLASSICAL METHODS AND EMBRYO CULTURE IN THE HYBRIDIZATION OF CULTIVATED SUNFLOWER AND HEXAPLOID PERENNIAL SPECIES *HELIANTHUS RESINOSUS*

Radostina Damyanova-Serbezova[1], Nina Nenova[2], Daniela Valkova[3], Miglena Drumeva[4]

Abstract

A distant hybridization was carried out between cultivated sunflower Helianthus annuus L. and the perennial wild species Helianthus resinosus, accession GT-M-046, with the aim of creating hybrid plants with enriched heredity and increased resistance to various stress factors. To overcome the difficulties in crossing, the embryo rescue method was applied. The cultivated sunflower was used as the maternal parent represented by the male sterile (CMS) line 830A. Self-pollination was applied in F_1, resulting in F_2 hybrid generation. The obtained hybrid material was subjected to phenological, morphological and biochemical studies. Hybrid plants were found to possess intermediate morphological characters tending to the wild parent and have a perennial life cycle. The oil and oleic acid content of both parental forms and the hybrid generation were determined. The plants were transferred to the wild species collection of DAI-Geneneral Toshevo and are grown under field conditions.

Key words: *distant hybridization, Helianthus resinosus, embryo rescue.*

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COMPENSATION FOR DAMAGE DUE TO OMISSIONS IN KEEPING AND MANIPULATING APPLE SEEDLINGS

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

Abstract

Raising large fruit plantations, very often involves the delivery of seedlings and their planting in a period of 2-3 days. It depends on the available workforce and mechanization, as well as on the accommodation capacity for keeping seedlings until the moment of planting. The passage of time and inadequate conditions for keeping seedlings can damage some seedlings, which is why they will progress differently after planting, and later bring an uneven crop and different yields. The owner of the orchard often blames the seller of the seedlings for the poor reception of the seedlings. Such cases often end in litigation, when the court hires licensed appraisers (experts) or commissions of experts, who will assess the causes of the damage. In this paper, one such case is analyzed, which ended with a court case and an expert assessment of the damage and the net value of the lost crop. It is indisputable that the owner of the fruit plantation suffers damage, which is shown by the evaluations of the experts, which were analyzed in this paper, and the court, based on the expertise and the evidence presented, makes the final verdict on who is to blame for the damage.

Key words: *apple planting, lost net worth, care of seedlings, care after planting, court experts*

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REACTION OF THE HERBICIDES ON THE STRUCTURAL ELEMENTS OF THE YIELD IN VARIETIES TRITICALE

Zornitsa Petrova[1], Hristo Stoyanov[2]

Abstract

The investigations were carried out during 2018 –2021 at Dobrudzha Agricultural Institute – General Toshevo. The aim of this investigation was to determine the reaction of the application of the herbicides on the structural elements of the yield in varieties triticale (xTriticosecale Witthm.). The following herbicides were used: Ergon WG (50 g/ha), Starane Gold (1800 ml/ha), Biatlon 4D+Desh (50g/ha+500ml/ha) and Korelo Duo+Das Oil (260.5 g/ha+500ml/ha) from the group of sulfunylureas with various mechanism of action. The preparations were applied at stage 29 and 37 of three varieties triticale, Akord, Kolorit and Dodbrudzhanets. These were the followed structural elements of the yield: hight plant (cm), length of spike (cm), number of spikelets per spike, number of grains per spike, weight of grain per spike (g). Correlation analysis was apllied. Strong positive and negative correlations were established between the investigation parameters.

Key words*: triticale, varieties, herbicides, application stages, structural elements of yield*

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III SECTION – REVITALIZATION OF RURAL AREAS

EFFICIENCY OF AGRICULTURAL EDUCATION IN PERSPECTIVE PROFESSIONAL EMPLOYMENT

Ancuța Marin[1], Daniela Ileana Dănilă[2]

Abstract

The paper reflects the state of the agricultural pre-university and university education system in Romania, highlighting the medium and long-term trends of the main indicators for education in accordance with the educational policies implemented. The methodological steps that were the basis of the elaboration of the work were the bibliometric, bibliographic and statistical-mathematical analysis. The basic indicators used in the paper are included in the National System of Indicators for Education (SNIE). SNIE is compatible with international indicator systems (Eurostat, OECD, UNESCO, World Bank) and includes part of the target indicators specific to common European objectives in the field of education. Official data provided by the Ministry of Education and the National Institute of Statistics for the period 2010-2023 were used to determine the values of the indicators. The efficiency of the education system was analyzed from the perspective of the professional insertion of graduates on the labor market. The purpose of this paper is to highlight the real problems facing education in general, agricultural education in particular, and to suggest possible solutions for them.

Key words: *education, agricultural education, educational efficiency, professional insertion.*

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ARE THE COFINANCED RURAL DEVELOPMENT ACTIONS IN ROMANIAN RURAL SHIFTING AS PRIORITIES?

Cosmin Salasan[1], Iasmina Iosim[2], Andrea Feher[3], Tabita Adamov[4], Raul Pascalau[5], Cosmina Toader[6], Carmen Simona Dumitrescu[7]

Abstract

The present research returns the recent findings regarding the current priorities and options of the key rural development actors as connected to the different forms of interventions and actions cofinanced from public funding. A particular attention is granted to the Common Agricultural Policy (CAP) funding as complementary funding from Eu and national budget sources. The observations are presented as a case study linked to the real developments undertaken by a Local Action Group, selected among the top ones for representativity. To separate the funding origin, the specific European Social Fund supported actions are only complementary to the CAP funding to preserve

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the rural development as neat as possible. The observations indicate that more attention is given to the specific actions related to the social dimensions of the rural development. Conclusions indicate that the current players grant considerably more attention to the future on medium and long term as well as to the current young and elderly generations before the immediate economic development actions. This new orientation presents itself as a maturity mark of the previous programming periods and active development involvement with the specific public financial support actions and instruments.

Key words: *rural development, Common Agricultural Policy, social development.*

RANKING FACTORS OF SUSTAINABLE DEVELOPMENT IN RURAL TOURIST HOUSEHOLDS

Danijela Pantović[1], Milica Luković[2], Jovana Davidović[3]

Abstract

Any contribution to the revival of the village contributes to the richness of the overall resources. Tourism in rural areas especially promotes and solves the problem of rural countries, such as unemployment, falling income in rural areas, falling standard of living agriculture and poor infrastructure. For the above reasons, it is very important to create a model of sustainability in rural areas, and it can be created through tourism. The paper tested the ranking model of the elements of sustainable development for rural tourist households in the Republic of Serbia. The goal of the paper is to present a model of a multicriteria approach for evaluating sustainable development criteria using the PROMETHEE methodology. Judging by the results obtained by PROMETHEE ranking, the owners of rural tourist households in Šumadija *administrative district recognize the highest level of sustainability compared to other administrative districts.*

Key words: *sustainable development, rural tourism households, ranking.*

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MANIFESTATIONS AS AN ADDITIONAL OFFER OF WINE TOURISM

Drago Cvijanović[1], Sanja Bojović[2], Aleksandra Vujko[3]

Apstract

Wine tourism is a tourist trip that includes visiting vineyards, wineries, wine festivals and wine exhibitions where wine tasting and enjoying the beauty of the wine-growing region are the main culture of the trip. In the last couple of decades, the growth of wine tourism has been recorded. The subject of this paper was the tourist offer of the town of Vršac related to wine tourism and the events that accompany it. The research was carried out through a survey among the visitors of the "Grape Ball" event in Vršac. The aim of the survey is to examine the interest of tourists in such and similar manifestations as part of the tourist offer. In most cases, the respondents came to this city because of the event (83.45%).

Key words: *wine tourism, manifestations, Vršac*

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THE EVOLUTION OF RURAL TOURISM AND THE AGRITOURISM POTENTIAL OF A COUNTY IN ROMANIA

Ioana Sabina Zamfir[1]

Abstract

This paper explores the development of rural tourism in Argeş County, a region with high potential for the growth of the agritourism sector. The analysis aims to highlight the positive trend in rural tourism in Romania, as well as the economic relevance that agritourism could hold. Although it represents a niche industry, agritourism and rural tourism could become important factors in establishing an economic balance between the country's rural and urban areas.

Key words: *tourism, agritourism, rural, economy, development.*

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THE ROLE OF THE LABOUR FORCE ON FAMILY AGRICULTURAL FARMS IN THE REPUBLIC OF SERBIA

Marija Popović[1]

Abstract

The aim of the work is to show the role of the labour force on family farms in the Republic of Serbia as one of the most important resources for agricultural production. The labour force is a key factor in the development of agriculture and rural areas. The unfavorable age structure affects the effective use of the labor force and the productivity of work in agriculture, where there is a pronounced decline in the participation of young people and an increase in the share of the elderly in agricultural production. According to the data of the Census of Agriculture from 2023, the number of members and permanent employees on agricultural farms in the Republic of Serbia is 1,135,071 people. Of the total number family farms, 506,736 (44.6%) are holders of the farms, 627,193 (55.3%) are members of the farms, while 1,142 (0.1%) are permanently employed.

Key words: *labor force, family farms, agriculture, Serbia.*

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NEW APPROACHES TO STIMULATE ENTREPRENEURIAL INITIATIVES IN RURAL AREAS

Mihai Dinu [1], Alina Florentina Gheorghe [2], Maria Ioana Urs[3]

Abstract

This study examines the importance of promoting entrepreneurship in rural areas and proposes strategic measures to support this objective. The hypothesis suggests that entrepreneurship is essential for reducing economic and social disparities between rural and urban regions. Using a 20-question questionnaire as the primary research tool, the paper evaluates rural entrepreneurship in Romania and the EU, assesses financial support instruments, identifies challenges, and suggests strategies for business growth in rural areas. The study also developed a tool for assessing entrepreneurial skills, linking entrepreneurial motivation to business success. Findings highlight the need for Romania to invest in an entrepreneurial culture to drive economic growth, especially in rural areas.

Key words: *rural entrepreneurship, entrepreneurial spirit, business, economic disparity, social disparity, strategic measures.*

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THE ROLE OF NWFPS IN THE DEVELOPMENT OF ENTREPRENEURSHIP IN SOUTHEASTERN SERBIA

Milica Marčeta[1], Ljiljana Keča[2], Sreten Jelić[3]

Abstract

In the social context, forests have a significant role for many inhabitants, either in the form of livelihood, or income generated from a wide range of wood and non-wood forest products (NWFPs). In this research, NWFPs were analyzed as a component of rural entrepreneurship in southeastern Serbia. In this regard, 11 companies dealing with the purchase, processing, and marketing of mushrooms, forest fruits, and medicinal herbs were surveyed. The period considered is 2008-2017. The aim of the research was to familiarize with the elements of business related to the marketing mix (product, price, promotion, and distribution) in these companies, as well as to assess the possibilities for their improvement. In this way, it aimed to recognize the potential for the development of primarily small entrepreneurship in Southeastern Serbia through the use of NWFPs for commercial purposes.

Key words: *Southeast Serbia, NWFPs, companies, marketing mix.*

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CORRELATION OF PRO-ENVIRONMENTAL ATTITUDES AND PERSONALITY DIMENSIONS IN ADOLESCENTS

Milivoje Ćosić[1], Miroljub Ivanović[2]

Abstract

The aim of the research was to examine the interaction between pro-environmental attitudes (growth limits, anthropocentrism, natural balance, rejection of exceptionalist claims and the possibility of ecological crisis) of adolescents and their personality traits (agreeableness, conscientiousness, openness, neuroticism and extraversion) on a convenient sample of 156 high school students, with a age range of 16 – 18 years (M_{age} = 17.6 years; SD = 10.02). Two instruments were used for the processing of statistical data: New Ecological Paradigm scale – NEP (Dunlap et al., 2024) and Big Five Inventory – BFI (John et al., 2008). The internal consistency coefficients indicate that the applied measuring instruments are valid and reliable for the evaluation of pro-environmental attitudes and personality traits, and can be used for research purposes in the Serbian population as well. The results of the correlation analysis showed a statistically significant, negative and low intensity between the variables of pro-environmental attitudes and the trait openness. In addition, a significant, negative and low co-relationship between pro-environmental attitudes and personality traits constructs (conscientiousness and agreeableness) was defined. However, no statistically significant correlation was found between pro-environmental attitudes and personality traits (neuroticism and extroversion). In general, this transversal study expands on the previous knowledge and defines the interactions between the variables of pro-environmental attitudes and personality dimensions and discusses the theoretical and practical implications of the obtained findings for future research and practice in the Republic of Serbia.

Key words: *ecological paradigm, NEP subdomains, five-factor model, conscientiousness.*

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EXPLORING SUSTAINABLE TOURISM: ECOTOURISM, COMMUNITY ENGAGEMENT AND RURAL TOURISM[1]

Nataša Đorđević[2], Marija Mandarić[3], Snežana Milićević[4], Radomir Jovanović[5]

Abstract

This paper addresses the critical issue of overtourism and its detrimental effects on global destinations and emphasizes the urgent need for sustainable tourism development as a viable solution. As the tourism sector has experienced significant growth in recent years, it also faces challenges related to mass tourism, which threatens the environmental and cultural integrity of popular destinations. By exploring sustainable tourism practices such as ecotourism, community-based tourism and rural tourism, this study aims to demonstrate how these approaches can mitigate the negative impacts of overtourism while increasing local economic benefits and preserving cultural heritage.

Key words: *sustainable forms of tourism, sustainable development, overtourism, ecotourism, community-based tourism, rural tourism.*

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TOURISM, AN ESSENTIAL COMPONENT IN REVITALIZING THE ECONOMY OF THE RURAL AREA IN CARAȘ-SEVERIN COUNTY

Păun Ion Otiman[1], Nicoleta Mateoc-Sîrb[2], Adrian Băneș[3], Cosmin Sălășan[4], Andrea Feher[5], Miroslav Raicov[6], Gabriel Șuster[7], Paula Diana Otiman-Peev[8]

Abstract

From the comparative data (before the pandemic, 2017-2018-2019) of the South-East European studied countries (Romania, Bulgaria, Croatia, Slovenia and Serbia), it follows that the general tourist activity (qualitative and quantitative) of Romania is much below the level of competing neighboring countries, as well as below the natural potential offered by our country. Although all three EU member countries have a much smaller area and population, and GDP per inhabitant below the level of Romania

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(except Slovenia), they have double (Bulgaria and Serbia) or 3.5 times higher (Slovenia) tourist intensity, or 6.4 times more intense (Croatia). Even Serbia, a non-EU country, left without access to the sea (respectively coastline) after the dissolution of Yugoslavia, has indicators of tourist activity far above the level of Romania. Following the studies carried out, it was found that the forms of tourism practicable in the mountainous area of Caraș-Severin County, which can determine its economic development, are: mountain tourism, spa tourism, cultural tourism and agrotourism.

Key words: *tourism, rural area, rural economy, rural development.*

DIFFERENCES IN THE LEVEL OF PIG SUBSIDIES BETWEEN ROMANIA AND EU COUNTRIES

Petra-Cătălina Șerbănescu[1], Luiza-Georgiana Costache[2], Marius-Eduard Udrea[3]

Abstract

The proposed study explores the level of subsidies for pig farming is significantly lower in Romania compared to EU countries. This discrepancy creates a competitive disadvantage for Romanian producers, leading to higher production costs and less competitive prices for Romanian pork. Romanian producers struggle to access domestic and foreign markets because of higher prices.

Decreased competitiveness could lead to a decrease in pork production in Romania, with an impact on the rural economy. Reduced domestic production could lead to greater dependence on pork imports, affecting Romania's food security.

Research into the disparity of subsidies for pig farming is crucial for understanding the challenges faced by the Romanian sector and identifying effective support solutions. The implementation of strategies based on the research results will contribute to strengthening the competitiveness of the sector, boosting the rural economy and ensuring Romania's food security.

Key words: *Subsidies, pig farming, competitiveness, subsidy gap, impact.*

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SUSTAINABLE DEVELOPMENT OF TOURISM IN THE MUNICIPALITY OF MALO CRNIĆE[1]

Predrag Vuković[2], Nataša Kljajić[3], Anton Puškarić[4]

Abstract

The municipality of Malo Crniće is located in the Braničevo district. Territorially, it belongs to Eastern Serbia. It is surrounded by the municipalities of Požarevac, Veliko Gradište, Kučevo, Petrovac, and Žabari. There are a total of nineteen inhabited places on the territory of the municipality. According to the OECD criteria, the municipality of Malo Crniće can be said to be predominantly rural in terms of its geographic coverage structure. The territory of the municipality has a large number of natural and social (anthropogenic) resources suitable for the development of tourism. Unfortunately, the largest number of these resources ie. natural and social attractiveness has not yet been put into the function of tourism development. In order to move from the stage of spontaneous development of tourism to a higher stage of development, it is necessary to follow the appropriate principles and rules of development. One of them is certainly the principle of sustainable development. The demand for the preservation of natural and social attractiveness must represent an imperative in the development of tourism. The aim of the work is to present the respectable and so far little used potentials of tourism development in the municipality of Malo Crniće, and to indicate the strategic directions of possible tourism development. The expectations are that tourism, with its multiplied positive influence and synergistic character, would connect a large number of economic and non-economic activities and help the future development of the municipality.

Key words: *tourism, destination, rural area, economy, rural development.*

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RURAL DEVELOPMENT THROUGH NATURE: THE POTENTIAL OF HIKING TRAILS ON THE MOUNTAIN STARA PLANINA[1]

Radmila Jovanović[2], Debajit Datta[3], Maria Paula Michalijos[4]

Abstract

This article presents an analysis of the existing hiking trails leading to the falls at Star Planina, identifying gaps in the mapped trails, specifically waterfalls in the basin of the Jelovac River. This study aims to propose an optimal route using a minimum cost route approach through GIS and digital elevation models (DEM), which connects unidentified waterfalls from different river basins. The resulting road stretches for 5.04 km with an elevation difference from 1,356 to 1,769 m, effectively linking the Orlov Kamen waterfalls in the basin of the Dojkinci River and the waterfalls in the basin of the Jelovac River.

The method involves calculating distance and slope to determine possible walking routes. Analysis shows that many watersheds in the basin of the Jelovac River in particular is often unmapped and disconnected from nearby watersheds. The main results indicate that the maximum distance measured between the Orlov Kamen and the adjacent waterfalls are 2.3 km. This study emphasizes the importance of developing a trail network not only to promote public health and recreation, but also to enhance the quality of life. but also rural development by promoting the natural heritage of the area. This can lead to economic sustainability and community cohesion. Investing in infrastructure and community engagement is critical to improving Stara Planina's accessibility and conserving its natural resources.

Key words: *hiking trail, Stara Planina, waterfalls, Jelovac-Dojkinci rivers, potential, development.*

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IS RURAL TOURISM A CHANCE FOR DEVELOPMENT AND REVITALISATION OF ARANDJELOVAC MUNICIPALITY?

Sara Stanić Jovanović[1], *Božo Ilić*[2], *Nevena Miletović*[3]

Abstract

The municipality of Aranđelovac with Bukovička Spa has had a tradition more than two centuries long when it comes to spa and health tourism. Aranđelovac is the third largest municipality in Šumadija district with an area of 376 km2, and the second in terms of population (41,297 inhabitants according to the 2022 census). Currently, the relatively favourable traffic and tourist position of Arandjelovac on the M4 regional road will be greatly improved by the construction of 'Vožd Karađorđe' highway, while the connection with emission centers will undoubtedly contribute to the development of tourism. Surrounded by Bukulja and Venčac mountains, with 25.2% of the territory under forest, the territory of Arandjelovac municipality is characterized by a moderate-continental climate, which, especially in the higher parts of the territory, has a favorable effect on the human body. Aranđelovac is known for Bukovička Banja Park (Special Hospital, Staro Zdanje, springs), Risovača Cave, the "Marble and Sounds" art exhibition, 'Izvor' hotel, but also the nearby famous place of Orašac with the Maićević ravine, the place known for The first Serbian uprising. The efforts of the Tourism Organization of the Municipality of Aranđelovac in recent years have been in favor of the development of specific forms of tourism, from wine and gastronomic routes, adventure tourism, fishing, events and manifestations, to cultural and historical tours. Everything that rural tourism can offer takes a special place in all of this, which represents a significant opportunity and development trend in the tourist market, but also an important opportunity for the revitalisation of the Arandjelovac municipality.

Key words: *revitalisation, tourism, countryside, development, municipality Aranđelovac*.

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THE INFLUENCE OF VINE GROWING AND WINE PRODUCTION ON THE DEVELOPMENT OF RURAL TOURISM IN SERBIA

Zoran Simonović[1], Vuk Miletić[2]

Abstract

In this paper, we wanted to point out the influence that viticulture and production wines can have on the development of rural tourism in Serbia. The value of grapes is best seen when there is not enough of them and when there is a shortage of them, which in practice leads to a large increase in prices. The value of grapes comes to the fore even more when it is related to wine production, because viticulture and wine production are the face and the reverse of the same production-processing policy. Apart from providing grapes for wine production, it is also a key element that can contribute to rural development. Rural policy is important for Serbia due to depopulation trends and the rapid evacuation of the population from rural areas. In this sense, the development of wine tourism in Serbia should be directed towards finding mechanisms to prevent the deterioration of villages and rural areas in the concept of tourism development (strengthening of infrastructure, increasing the attractiveness of rural areas, enrichment of tourist content, diversification of the rural economy). The standardization that would be implemented within the rural tourism sector and under the wine tourism sector should lead to a better integration of agriculture and tourism in planning documents, but also in practice. In that process, greater participation of the owners of rural households and wineries is necessary. Finally, it is necessary to raise the education and awareness of the local population about the possibilities of rural and wine tourism (education continuously, not sporadically).

Key words: *viticulture, wine production, rural tourism, wine tourism, Serbia.*

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IV SECTION – DIGITALIZATION IN AGRICULTURE

THE POLITICS OF DIGITAL AGRICULTURAL TECHNOLOGIES: A PRELIMINARY REVIEW

Alexandra Mîț, Lorena Cristina Pîrvu[1]

Abstract

From farm to fork, digital technologies are being created and embraced throughout the agro-food system. Yet, political considerations brought about by these technological advancements are not given much thought in decision-making settings. This paper examines new technologies and big data systems in agriculture and evaluates some of the major problems that are emerging in the industry by drawing on critical social sciences. After providing an overview and introduction to the so-called „digital revolution," we quickly discuss how political economy might be used to comprehend the main issues facing the regulation of agricultural technologies and data systems. Data ownership and control, technology development and manufacturing, and data security are some of these issues. Then, using examples and literature, we examine how much the political and economic environment.

Key words: *digital revolution, agri-food system.*

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FORMS OF ENTREPRENEURIAL EXPRESSION IN INTERNATIONALIZED AGRIFOOD MARKETS

Alexandra-Ștefania Ilie[1], *Răzvan-Ștefan Nițu* [2]

Abstract

How does the international environment influence the efficiency and global economic performance of a business, and what are the strategies for maximizing it? The topic, refers to the research and understanding of the various ways entrepreneurs conduct their activities and adjust their strategies to successfully operate in global markets. This process is based on the discovery of business opportunities outside the country, the development and implementation of entry strategies into foreign markets, modifying products or services to meet local demands and preferences, managing the risks specific to the international environment, and establishing relationships with certain partners and clients from different countries. The research objective is to investigate and understand the success factors, effective strategies, and the impact of the international environment on entrepreneurial expression. In conclusion, to maximize global economic performance, businesses must effectively manage regulations, currency fluctuations, cultural differences, and political risks through diversification, hedging, local adaptation, and innovation.

Key words: *internationalization, agrifood entrepreneurship, sustainability, digital platforms, global agribusiness.*

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COMPARATIVE BIBLIOMETRIC INSIGHTS: SUSTAINABILITY RESEARCH IN SERBIA AND ROMANIA

Cristiana-Adriana Dragodan[1], Irina Puiu[2]

Abstract

This study aims to evaluate the current state of sustainability research, highlighting trends, key terms, and their interconnections while identifying potential gaps in the scientific literature. A comparative analysis between Romania and Serbia is conducted to assess the level of research development in both countries. Data was retrieved from the Web of Science database using the keyword „sustainability," resulting in 505,154 records globally, of which 6,455 pertain to Romania and 2,094 to Serbia. Specific filters, detailed in the methodology, narrowed the dataset to 2,000 entries, including the most cited articles. A bibliometric analysis was performed using VOSviewer software, providing insights into publication trends, collaboration networks, and research impact in sustainability.

Key words: *sustainability, bibliometric analysis, comparison, scientific literature, Serbia, Romania.*

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SMART FARMS AND PROJECT MANAGEMENT IN SUSTAINABLE AGRO-TOURISM

Dragana Vuković[1], Marica Milošević[2], Tamara Popović[3]

Abstract

This paper explores the concept of smart farms and their application in managing sustainable agro-tourism projects. As an innovative form of agriculture, smart farms integrate advanced technologies such as the Internet of Things (IoT), sensors, and digital analytics to enhance efficiency and productivity. This research analyses their impact on agro-tourism development aligned with sustainability principles. The paper also examines project management strategies in this sector, including resource optimization, improvement of tourism offerings, and enhancement of environmental awareness. Through case studies and data analysis, the paper provides insight into the key benefits and challenges associated with implementing smart technologies in agro-tourism and demonstrates the potential for the long-term sustainable development of rural communities.

Key words: *Smart farms, sustainable agro-tourism, project management, digital transformation, rural development.*

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THE IMPACT OF DIGITALIZATION IN AGRICULTURE IN ROMANIA AND SERBIA

Iuliana Gogancea, Marilena Iliescu, Mihai Mitrea[1]

Abstract

This paper examines the impact of digitalization in agriculture within Romania and Serbia, focusing on the adoption and integration of advanced technologies such as precision farming, IoT, and data analytics. The study highlights how these digital tools enhance productivity, optimize resource management, and promote sustainable agricultural practices. By comparing the implementation strategies and outcomes in both countries, the paper identifies key challenges and opportunities faced by farmers. The research also explores the role of government policies and support in facilitating the digital transformation of the agricultural sector. Findings suggest that while both countries have made significant strides, further investment in infrastructure and education is essential to fully realize the benefits of digital agriculture.

Key words: *digitalization, agriculture, Romania, Serbia, precision farming, IoT, sustainability.*

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TRANSFORMATIVE POTENTIALS OF REGENERATIVE AGRICULTURE IN THE FUNCTION OF SUSTAINABLE AGRICULTURAL PRODUCTION

Ivana Filipović[1], Sonja Jovanović[2]

Abstract

The growth of the world population and the increase in food and energy consumption are putting agricultural production in an unenviable situation. The problem stems from the need for rapid growth in food production, which is carried out through specialized operations of conventional agricultural production. Regenerative agriculture is an approach based on the sustainable use of natural resources without harmful impacts on the environment by relying significantly less on production inputs (chemicals and machinery). The subject of the paper is an analysis of the advantages of applying regenerative agricultural practices as a response to sustainable agricultural production and global food security. This paper aims to highlight the potential of regenerative agriculture that stems from the application of modern agricultural technology in terms of achieving the digital transformation of agriculture and sustainable resource management in agriculture.

Key words: *sustainability, regenerative agriculture, environment, natural resources, climate change, Agri-tech 4.0.*

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GREEN ARCHITECTURE AND SMART VILLAGES

Katarina Stojanović[1], Vladimir Pejanović[2], Vladan Cogoljević[3]

Abstract

The concept of "smart villages" is increasingly becoming an important topic in various fields. Sustainable development and the idea of reducing the harmful consequences of human presence on the planet encouraged experts in various fields to start looking for useful solutions. Green architecture, as a proactive reaction to the challenges of contemporary rural and urban planning, represents a key paradigm in building sustainable communities. This practice integrates innovative principles of nature conservation, resource efficiency and quality of life enhancement to create a holistic environment that reflects the harmony between the built space and the natural world. Sustainable architecture sets an extremely difficult task in front of itself - how to design a healthy environment with as many natural elements as possible, which will save energy, look beautiful and be a counterweight to the increasing degree of alienation. The goal of green design is to reduce the amount of resources used in the construction, use and maintenance of buildings, as well as pollution, eliminating waste and harmful emissions resulting from these activities. This study aims to better understand the relationship between green architecture and smart village and their influence on each other, where the focus is on the role that green architecture plays in the planning and implementation of smart villages.

Key words: *rural development, sustainable development, green architecture, smart village, quality.*

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AUTOMATION IN AGRICULTURE: THE ROLE OF ADVANCED TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE IN INCREASING EFIICIENCY

Bumbaru Marian[1], Anghel Teodor-Florin[2], Hotnog Alexandru[3]

Abstract

The modernization of agriculture through advanced technologies and artificial intelligence (AI) brings concrete solutions for process efficiency. Precision technologies, such as drones and sensors, enable detailed monitoring of soil and crop conditions, reducing excessive use of water and fertilizers. AI algorithms, integrated into climate prediction systems and agricultural software, can analyze complex data to determine the optimal time for sowing and harvesting. Autonomous machines, such as smart tractors, can perform mechanized tasks without human intervention, increasing productivity and reducing errors. Automated harvesting robots enhance efficiency by lowering labor costs. Additionally, AI facilitates the real-time detection of diseases and pests, preventing crop losses. These technologies allow farmers to manage large farms more efficiently, optimize resources, and address global challenges, such as climate change and the growing demand for food.

Key words: *agriculture, artificial intelligence (A.I.), sustainability, efficiency.*

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STUDIES WITH REFERENCE TO THE IMPLEMENTATION OF THE SMART VILLAGE CONCEPT IN ROMANIAN VILLAGES

Nicoleta Mateoc-Sîrb[1], Ionut-Cosmin Gheorghescu[2], Aurora Eleonora Twarowski[3], Ioana Balan[4], Teodor Mateoc[5], Natalia Mocanu[6], Camelia Mănescu[7]

Abstract

Currently, rural areas are undergoing rapid changes. The idea of smart villages is a response to current rural development problems stemming from ongoing demographic changes, mainly the aging population and an exodus of young people from rural areas, low population density, fewer and fewer jobs, an insufficient and decreasing range of services offered in these areas or the lack of funds for investment. Digitalization has become an essential aspect of modern society, being present in all activities of daily life. The article aims to highlight the importance of implementing the Smart Village concept for the viability of villages in Romania. Smart Village is a relatively new concept that refers to the development of rural communities through the use of technology and innovation. In conclusion, the purpose of digitalization is to create value and bring significant benefits to organizations, communities, and society as a whole through the use of digital tech-

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nologies, to improve existing processes and services or to develop new solutions and innovations, and the digitalization of public and social services can bring significant benefits to rural areas, contributing to improving access to essential services, the efficiency of public administration and stimulating economic and social development.

Key words: *Smart Village, digitization, villages, development.*

THE CHALLENGES OF DIGITIZATION IN AGRICULTURE FOR SUSTAINABLE RURAL DEVELOPMENT

Sorin Burlacu[1], Florina Bran[2], Carmen-Valentina Rădulescu[3], Vicenţiu Mihai Mateescu[4]

Abstract

The aim of this research is to identify and analyze the challenges and opportunities that digitization brings to agriculture, in the context of sustainable rural development. The methodology used is a systematic literature review, which synthesizes recent studies to highlight the main challenges, solutions and impacts of digitization in agriculture. The gap identified in the existing literature is the lack of an integrative approach that correlates the specific challenges of infrastructure, skills and public policies with the impact of digitization on smallholder farmers and vulnerable rural communities.

The main findings highlight that digitization in agriculture is limited by poor access to digital infrastructure in rural areas and the costs associated with modern technologies, which impose an urgent need for investment and public-private partnerships. Also, the lack of digital skills among farmers is an important barrier, suggesting the need for educational programs to facilitate the adoption of advanced technologies. From an ecological point of view, digital technologies such as "digital twin" and "smart farming" present significant opportunities for ecologically responsible agriculture, optimizing resource use and reducing environmental impact.

The added value of this research lies in the systematic and integrative approach to digitization in agriculture, providing an in-depth understanding of the interplay between challenges, opportunities and policies. Limitations of the study derive from the focus on existing literature, which may limit the direct applicability of the results to empirically unexplored contexts.

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The findings suggest that although digitization presents many challenges, it has the potential to support sustainable rural development through technological solutions and adequate public support. Future research directions include empirical studies to test proposed solutions in different rural contexts and the development of integrated strategies to support the adoption of digital technologies among smallholder farmers.

Key words: *digitization in agriculture, sustainable rural development, digital infrastructure, digital skills, ecological agriculture, public policies, organizational resilience.*

PROCESS CONTROL IN AGROINDUSTRY

Vladimir Pejanović[1], Platon Sovilj[2], Nemanja Gazivoda[3]

Abstract

Process control in agroindustry encompasses measurement and control systems that optimize agricultural operations through precise and accurate measurement, monitoring, and automation. Precise and accurate measurement serves the function of quality, which is a key competitive factor in sustainable development conditions. The implementation of smart farming solutions with process control enables real-time monitoring and control of critical parameters, including irrigation, heating, cooling, and air quality management. Modern metrological services provide necessary calibration of temperature measuring instruments, which further enable adequate temperature regulation in grain silos, sugar warehouses, flour mills, and other agricultural storage facilities. System integration extends to measuring truck scales at agricultural farms, customs terminals, and logistics centers, ensuring accurate and precise mass measurements throughout the entire supply chain. Advanced monitoring solutions help reduce operational costs, minimize losses, and reduce environmental impact through automated control systems. Quality control systems in the food industry maintain strict standards through accurate and precise measurements and regulatory protocols. Implementation of these control processes, although initially requiring significant investments and training, results in increased productivity and operational efficiency. Regular maintenance and calibration of measuring equipment, although time-consuming, are key to maintaining accuracy, precision, stability, and reliability of systems, and compliance with regulations in agroindustrial operations.

Key words: *process control, agroindustry, quality, automation, accuracy, precision, stability, reliability, agricultural supply chain.*

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